

APPENDIX C Reach Priorities and Restoration Opportunities

Reach ID	Physical Characteristics	Shoreline Modification	Potential Functions Impacted	Management Issues	PHS	Eco-Process Priority	Action	Source	Status
CC_Columbia_08	Upper flooded surge plain on the east side of the Elochoman River. Land cover is dominated by non-tidal coniferous wetland forests with a large area of deciduous non-tidal wetland forest. Land use is designated open space.		None noted			Columbia white-tailed deer, cavity nesting ducks, sitka spruce and willow shrub swamp, purple martins, heron rookery, Roosevelt Elk Winter Range: Willapa herd. Chum, spring, summer and fall Chinook, winter and summer steelhead, green and white sturgeon, sockeye, cutthroat, coho, bull trout, pink salmon presence.	Highest Protection, Highest Restoration, Protection, Protection/Restoration, Restoration		
CC_Columbia_09	Developed floodplain. Land cover is dominated by developed open space and bare area. Other land cover types include non-tidal coniferous wetland forests. Land use is designated by lumber/wood products production.	Industrial Development (Lumber yard), Developed open space land	Impervious surfaces and general loss of vegetation in and around the shoreline may affect surface water flow, groundwater infiltration, aquifer recharge and nutrient/contaminant removal. May include impacts to: flooding, water quality/quantity, and flow energy, habitat, headwater input, and water temperatures. System of levees may impact hydrologic and sediment transport, storage and floodplain habitat/vegetation growth. May also impact habitat accessibility and quality. Piers, docks, or boat ramps may alter hydrologic/sediment transport and shoreline habitat components (e.g., light, vegetation). May include impacts to: beach sediment size/ type/ abundance, flow energy, water quality, drift material accumulation, erosion on adjacent properties, and habitat modification. Roads within associated wetlands may result in habitat fragmentation and altered hydrologic transport. Reduction of channel and side channel habitat and rearing capacity. Railroads within the floodplain may result in reduced or altered floodplain, channel and side channel connectivity, water storage, and/or floodplain capacity.	WQ impacts from industrial development, riparian/floodplain modified. Slough channel undersized culvert under SR 4	Roosevelt Elk Winter Range: Willapa herd, cavity nesting duck. Chum, spring, summer and fall Chinook, winter and summer steelhead, green and white sturgeon, sockeye, cutthroat, coho, bull trout, pink salmon presence.	Conservation, Restoration/Development, Restoration, Protection/Restoration, Protection, Highest Restoration, Development/Restoration	Replace undersized culvert	CREST	Concept

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CC_Columbia_10	This reach includes the Town of Cathlamet. Developed floodplain and upland areas. Land cover is dominated by developed open space and urban/impervious surface. Other land cover types include deciduous upland forest and even smaller areas of coniferous upland forest. Land use includes government services (public marina/port), undeveloped land, and single-family residential development.	Marina development, Commercial/Industrial development, impervious roadway/surfaces, single family homes. 4 docks not including Marina. Med. & low density pile field. Rock reinforced shoreline	Piers, docks, or boat ramps may alter hydrologic/ sediment transport and shoreline habitat components (e.g., light, vegetation). May include impacts to: beach sediment size/ type/ abundance, flow energy, water quality, drift material accumulation, erosion on adjacent properties, and habitat modification. Shoreline armoring may alter hydrologic/sediment transport. May include impacts to: water quality, beach scouring/lowering, erosion, fish migration, beach sediment size/type/abundance, drift material accumulation, habitat, wave energy, shoreline hydrodynamics, and drift. Culverts may alter water/sediment transport. Impacts include effects to water velocity and development of habitat features (pools/riffles/gravel bars). If undersized, impacts may include: increased water velocity, incised channels, erosion, road washouts, and downstream flooding.	WQ impacts from upriver development. Habitat, riparian and floodplain modification. WQ impacts from water treatment facility. 305b listing for exotic invasive species.	Roosevelt Elk Winter Range: Willapa herd, cavity nesting ducks. Chum, spring, summer and fall Chinook, winter and summer steelhead, green and white sturgeon, sockeye, cutthroat, coho, bull trout, pink salmon presence.	Conservation, Restoration/Development, Restoration, Protection/Restoration, Protection, Highest Restoration, Development/Restoration			
CC_Columbia_11	This reach includes the Town of Cathlamet. Developed floodplain and upland areas. Land cover is dominated by urban/impervious surface. Other land cover types include deciduous upland forest and smaller areas of coniferous upland forest. Land use includes some developed and undeveloped open space (which includes the water treatment plant), cultural museum, utilities, marine craft transportation and retail (with some over water and floating structures), single and multi-family residential development, fishery/fishing activities, and some undeveloped land.	Commercial/Industrial development, impervious roadway/surfaces, single family homes. 4 docks not including Marina. Med. & low density pile field. Rock reinforced shoreline. Bernie Creek invasive species degrades habitat quality.	Piers, docks, or boat ramps may alter hydrologic/ sediment transport and shoreline habitat components (e.g., light, vegetation). May include impacts to: beach sediment size/ type/ abundance, flow energy, water quality, drift material accumulation, erosion on adjacent properties, and habitat modification. Shoreline armoring may alter hydrologic/sediment transport. May include impacts to: water quality, beach scouring/lowering, erosion, fish migration, beach sediment size/type/abundance, drift material accumulation, habitat, wave energy, shoreline hydrodynamics, and drift. Culverts may alter water/sediment transport. Impacts include effects to water velocity and development of habitat features (pools/riffles/gravel bars). If undersized, impacts may include: increased water velocity, incised channels, erosion, road washouts, and downstream flooding. Water treatment may effect water quality including temperature and biological impairments. Impervious surfaces and general loss of vegetation in and around the shoreline may affect surface water flow, groundwater infiltration, aquifer recharge and nutrient/contaminant removal. May include impacts to: flooding, water quality/quantity, and flow energy, habitat, headwater input, and water temperatures.	WQ impacts from water treatment facility and urban development. Modified floodplain/riparian habitat. 305b listing for exotic invasive species	Roosevelt Elk Winter Range: Willapa herd. Chum, spring, summer and fall Chinook, winter and summer steelhead, green and white sturgeon, sockeye, cutthroat, coho, bull trout, pink salmon presence.	Conservation, Restoration/Development, Protection/Restoration, Protection, Highest Restoration, Highest Protection, Development/Restoration	Wetland invasive species control/management	CREST	Concept
		Fish passage barrier in Bernie Creek					modify the existing box culvert to improve the downstream grade	WDFW, Town of Cathlamet	Complete
		Reclaimed sewer lagoons					Opportunity for wetland creation, riparian restoration, invasive species treatment as part of a larger parks planning effort	Town of Cathlamet	Concept
		Fish passage barrier in Bernie Creek					Remove relic structure in Bernie Creek to improve fish passage	CREST	Concept

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CC_Columbia_12	Just upriver of the Town of Cathlamet. Consists of mostly upland areas on relatively steep bluffs. Areas below the bluffs include intermittently exposed areas, and a filled area/artificial floodplain. Land cover is dominated by deciduous upland forest and even smaller areas of coniferous upland forest. Land use is dominated by undeveloped land. Other land uses include open space and single-family residential development.	Bridge to Puget Island. At least 5 docks (3 of the 5 are for industrial uses), Derelict vessels, Derelict houseboat and dock, Impervious roadway/surface and urban development. Some old piling.	Piers, docks, or boat ramps may alter hydrologic/sediment transport and shoreline habitat components (e.g., light, vegetation). May include impacts to: beach sediment size/ type/ abundance, flow energy, water quality, drift material accumulation, erosion on adjacent properties, and habitat modification. Shoreline armoring may alter hydrologic/sediment transport. May include impacts to: water quality, beach scouring/lowering, erosion, fish migration, beach sediment size/type/abundance, drift material accumulation, habitat, wave energy, shoreline hydrodynamics, and drift. Bridges may alter water/sediment transport. Impacts include effects to water velocity and development of habitat features (pools/riffles/gravel bars). If undersized, impacts may include: increased water velocity, incised channels, erosion, road washouts, and downstream flooding. Impervious surfaces and general loss of vegetation in and around the shoreline may affect surface water flow, groundwater infiltration, aquifer recharge and nutrient/contaminant removal. May include impacts to: flooding, water quality/quantity, and flow energy, habitat, headwater input, and water temperatures.	WQ impacts from urban development/impervious surfaces. Development on bluffs. 305b listing for exotic invasive species	Roosevelt Elk Winter Range: Willapa herd, fall and winter cormorant concentrations, cliff habitat, breeding vultures and raptors. Chum, spring, summer and fall Chinook, winter and summer steelhead, green and white sturgeon, sockeye, cutthroat, coho, bull trout, pink salmon presence.	Conservation, Restoration/Development, Protection/Restoration, Highest Restoration, Development/Restoration	Work with the DNR derelict vessel removal program to dismantle and remove derelict vessel	DNR, SAC, WDFW	Concept
CC_Columbia_13	Most of this reach is on steep upland areas. Below the bluffs is intermittently exposed areas. Land cover is dominated coniferous and deciduous upland forest. Highway 4 also goes through these reaches. Land use is a mix of forestry, non commercial forest, and undeveloped land.	Rural development, agricultural operations, single family development. Areas of Med. density piles.	Impervious surfaces and general loss of vegetation in and around the shoreline may affect surface water flow, groundwater infiltration, aquifer recharge and nutrient/contaminant removal. May include impacts to: flooding, water quality/quantity, and flow energy, habitat, headwater input, and water temperatures. Agriculture has reduced shoreline vegetation which may alter sediment transport, hydrologic regimes, and habitat. May include impacts to: erosion/bank stability, flow energy, water quality/ temperature/ storage, recruitment/ transport of woody/ organic debris and sediment, habitat, and flooding regimes. Development on steep cliffs may impact sediment transport including erosion. Piers, docks, or boat ramps may alter hydrologic/ sediment transport and shoreline habitat components (e.g., light, vegetation). May include impacts to: beach sediment size/ type/ abundance, flow energy, water quality, drift material accumulation, erosion on adjacent properties, and habitat modification. Shoreline armoring may alter hydrologic/sediment transport. May include impacts to: water quality, beach scouring/lowering, erosion, fish migration, beach sediment size/type/abundance, drift material accumulation, habitat, wave energy, shoreline hydrodynamics, and drift.	WQ from development/impervious surface and agricultural operations. Development in critical areas.	Roosevelt Elk Winter Range: Willapa herd, fall and winter cormorant concentrations, cliff habitat, breeding vultures and raptors. Documented eulachon spawning area. Dunn's salamander.	Conservation, Restoration/Development, Protection/Restoration, Highest Protection, Development/Restoration	remove pilings where feasible or utilize as part of a salmonid habitat enhancement project	LCFRB	Concept