

**Appendix 3-B:
Limiting Factors Analysis**

Salmon and Steelhead Habitat Limiting Factors – WRIA 18			
Lead Agency: Washington State Conservation Commission,			
Final Report, 1999			
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RECOMMENDATION	STREAM	REC. TYPE	RESPONSIBLE JURISDICTION
Stabilize Highland Irrigation Ditch to ensure stability during high flow events to avoid potential for fine sediment contribution to Bell Creek.	Bell	WQ	
Restore the lower, channelized reach of Bell Creek (downstream of Schmuck Road) and properly integrate with the estuary. Restoration must include removal of dikes, meandering of the channel, excavation of pools and additional LWD.	Bell	WQ	
Assess LWD status in Bell Creek and tributaries; develop and implement a short-term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored.	Bell	H	
Restore functional riparian zones through the watershed, and identify and correct areas affected by unrestricted animal access.	Bell	H	
Complete comprehensive barrier inventory for Bell Creek, prioritize, and implement correction measures.	Bell	H	
Review proposal to release treated Class A water into Bell Creek and ensure any release does not adversely affect channel conditions or salmonid habitat.	Bell	H	
WDFW should actively enforce screening requirements on the irrigation diversion upstream of Carrie Blake Park.	Bell	H	
HB 2514 Planning Unit should review instream flow concerns and investigate alternatives for ensuring instream flow.	Bell	IF	
Pursue removal of the tidegate and restoration of saltmarsh habitat in the estuary, including returning Gierin Creek to its former meandering location, which essentially bisected the marsh.	Gierin	H	
Develop and implement a short-term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored.	Gierin	H	
Restore functional riparian zones throughout watershed, particularly upstream of Holland Road, and identify and correct areas affected by unrestricted animal access.	Gierin	H	
Develop and implement a strategy for restoring estuarine processes and fish passage in Cassalery Creek.	Cassalery	H	
Complete comprehensive barrier inventory for Cassalery Creek (particularly upstream of Woodcock Road), prioritize, and implement correction measures.	Cassalery	H	

Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored.	Cassalery	H	
Restore functional riparian zones throughout the watershed, and identify and correct areas affected by unrestricted animal access.	Cassalery	H	
Department of Ecology should conduct a comprehensive assessment of water diversions from Cassalery Creek, determine consistency with water rights, and enforce against unauthorized water withdrawals.	Cassalery	H	DOE
The need to establish and ensure instream flows in Cassalery Creek should be referred to the HB 2514 Planning Unit (PU).	Cassalery	IF	PU
Department of Ecology should regularly monitor for chlorine presence downstream of Sunland Sewage Treatment Plant; remediate if necessary	Cassalery	WQ	DOE
Modify the tidegate to allow significantly greater tidal flux into the Cooper Creek estuary.	Cooper	H	
Modify or remove the water level control structure in the estuary to allow unimpeded fish passage.	Cooper	H	
Restore the stream to a meandering configuration, utilizing historic natural channel, where practicable.	Cooper	H	
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored.	Cooper	H	
Restore functional coniferous riparian zones	Cooper	H	
Restore functions of historic wetlands associated with lower Meadowbrook Creek.	Meadowbrook	H	
Identify and correct areas affected by unrestricted animal access	Meadowbrook	H	
Increase the span of the Sequim Dungeness Way bridge to improve floodplain function.	Meadowbrook	H	
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored	Meadowbrook	H	
Restore functional riparian zones throughout watershed	Meadowbrook	H	
County should adopt and implement a stormwater strategy for this rapidly developing watershed, including tributaries, that will remediate current stormwater effects and minimize additional future effects.	Matriotti	ALL	CC

Restore functional channel conditions between Runnion Road and Old Olympic Highway	Matriotti	H	
Identify and correct areas by unrestricted animal access	Matriotti	H	
Cease the release of fine sediment-laden stormwater from irrigation delivery systems to Matriotti Creek	Matriotti	H	
Complete comprehensive barrier inventory for Matriotti Creek, prioritize, and implement correction measures.	Matriotti	H	
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored	Matriotti	H	
Restore functional riparian zones throughout the watershed	Matriotti	H	
Refer restoration of tributary flows to Matriotti Creek (between Hooker and Atterberry roads) to the HB 2514 Planning Unit for resolution	Matriotti		LEG/PU
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored	Hurd	H	
Restore functional riparian zones throughout the watershed, particularly on WDFW-owned hatchery property	Hurd	H	
Monitor fish passage conditions at and downstream of the low irrigation dam; maintain function of the Bear Creek alluvial fan.	Bear	H	
Identify and correct areas affected by unrestricted animal access, fence and revegetate to reestablish functional riparian zones throughout the watershed.	Bear	H	
The Agnew Irrigation Company should cease the release of fine sediment laden stormwater flows to Bear Creek	Bear	H	AID
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored	Bear	H	
At a minimum, restore fish passage past the water intake dam, with dam removal as the preferred option to restore biological processes.	Canyon	H	
Evaluate restoration potential of historic lower portion of Canyon Creek, through the terrace immediately adjacent to the Dungeness River; implement as practicable	Canyon	H	
Evaluate potential to stabilize active slide upstream of dam.	Canyon	H	

Restore natural sediment transport downstream of dam.	Canyon	H	
Introduce LWD to the channel downstream of the dam to retain river gravels, provide habitat diversity, and restore spawning habitat.	Canyon	H	
Protect intact riparian zones upstream of the dam, restore functional riparian zones downstream of the dam.	Canyon	H	
Reduce the forest road density in the Caraco Creek watershed.	Caraco	H	
Maintain remaining forest roads in a manner that minimizes potential of mass wasting and fine sediment erosion.	Caraco	WQ	
Maintain riparian condition in Gray Wolf canyon	Gray Wolf	H	
Evaluate the forest road network in the watershed and implement actions necessary to prevent entry of fines and mass wasting events to the Gray Wolf River.	Gray Wolf	H	
Maintain forest roads in a manner that minimizes potential of mass wasting and fine sediment erosion.	Gold	H	
Identify and map deep seated failures and areas prone to shallow-rapid landslides; prevent land use activities (roads and harvest) that will exacerbate sediment contribution from these areas.	Gold	WQ	
Restore natural channel characteristics in gabion-controlled section of lower basin.	Gold	H	
Maintain >60% of watershed in a condition that provides hydrologic maturity (>age 25) (Wild Salmonid Policy)	Gold	H	
Restore forest road density to <2.4 mi/mi ² , which is the threshold density of concern identified in the Federal Watershed Analysis; confine roads to areas not sensitive to mass failures.	Gold		
Restore stability of slide prone areas; ensure road cross-drainage is maintained; consider abandonment of roads located on active and potential slide areas; provide sediment retention BMP's on active slides where practicable.	Silver		
Avoid future road construction on slide prone areas.	Silver		
Evaluate cause of channel instability and develop and implement a corrective plan.	McDonald	H	
Reforest timber harvested areas in the rain-on-snow zone; ensure that future timber harvest is done in a manner that maintains hydrologic maturity in the upper watershed.	McDonald	H	

Restore LWD presence and function from the mouth upstream to the mouth of Pederson Creek (RM 4.9); addition of LWD in upper watershed to provide channel and bank stability may also be beneficial.	McDonald	H	
Monitor/restore landslides on USFS lands.	McDonald	H	
Identify options to reduce/eliminate the influence of Dungeness River water, conveyed through the irrigation system, on homing ability of Dungeness and McDonald origin salmonids.	McDonald	H	
Reduce the flow energy increase that resulted from removal of the culverts at Old Olympic Highway.	Siebert	H	
Develop and implement a short term LWD strategy in lower Siebert Creek to restore LWD presence and pools, particularly from the mouth to Highway 101.	Siebert	H	
Abandon/relocate the forest road on East Fork.	Siebert		
Restore stability of slide prone areas; ensure road cross-drainage is maintained; consider abandonment of roads located on active slide areas; provide sediment retention BMP's on active slides where practicable.	Siebert		
Limit conversion of upper watershed to non-forest cover	Bagley	H	
Evaluate fish passage through log jams in lower Bagley Creek and implement remedial modifications, where warranted (Mike McHenry)	Bagley	H	
Provide unrestricted fish passage through the Highway 101 culvert and correct the additional two fish passage barriers upstream	Bagley	H	
Prevent animal access to channel upstream of Highway 101 and restore functional riparian zones through this area.	Bagley	H	
Replace the lowermost culvert on Bagley Creek Road, to prevent backwatering during peak flow events and bank erosion and sediment deposition upstream of the culvert	Bagley	H	
Restore LWD presence throughout the channel. Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored.	Bagley	H	
Adopt and implement instream flow requirements.	Bagley	IF	
Restore floodplain function downstream of RM 1.7, including the removal/pull back of dikes, elimination of floodplain constrictions, and restoration of natural banks.	Morse		

Restore LWD presence throughout the channel downstream of the natural falls at RM 4.9; develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored; ensure that LWD is passed downstream of the railroad trestle.	Morse	H	
Reestablish estuarine characteristics and function similar to historic conditions.	Morse	H	
Restore riparian function by encouraging conifer regeneration in deciduous stands that historically had a conifer component.	Morse	H	
Restore longshore littoral drift from marine bluffs to the west of Morse Creek	Morse	H	
Improve passage conditions, initially at Highway 101 and at RM 0.1, and subsequently at other location	Lees	H	
Restore riparian presence and function, develop and implement a short term LWD recovery strategy, and fence livestock away from the channel on agricultural areas on both the East and West forks	Lees		
Identify and removal/correct floodplain constrictions	Lees		
Evaluate flow and water quality impacts of runoff from the mill landfills, Highway 101, and agricultural areas of concern; remediate identified problems	Lees		
Educate landowners in the watershed on the importance of providing functional salmon habitat, particularly in regard to LWD, riparian vegetation, and preventing animal habitat access to the channel	Lees		
Restoration of natural floodplain function in the lower channelized portions of Ennis Creek	Ennis	H	
Restoration of the Ennis Creek intertidal estuary	Ennis	H	
Secure passage through Highway 101 by maintaining fishway/replace culvert with bridge	Ennis		
Collect and treat stormwater from Highway 101 and other impermeable surfaces	Ennis		
Restore damaged riparian areas and LWD presence and function throughout the channel	Ennis		
County/City should monitor water quality in the vicinity of the golf course	Ennis		

Correction of passage problems	Peabody	H	
Collection and treatment of stormwater	Peabody		
Removal of instream fill on ONP lands	Peabody	H	
LWD/Riparian improvements projects	Peabody		
Improve passage conditions and eliminate large reach of culverts	Valley	H	
Restore the lower ¾ mile of stream by re-meandering, restoring LWD, and recreating pools to the maximum extent possible	Valley	H	
Reestablish floodplain process by reducing or eliminating floodplain constrictions, particularly downstream of Highway 101	Valley	H	
Remediate stormwater management in the watershed to collect, treat, and discharge stormwater in a manner that avoids adverse impacts to Valley Creek and other surface waters	Valley		
Restore riparian vegetation communities and instream large wood	Valley	H	
Remediate stormwater management in the watershed to collect, treat and discharge stormwater in a manner that avoids adverse impacts to Tumwater Creek and other surface waters; particular attention should be given to eliminating stormwater discharges that are creating major sediment contribution off Black Diamond Road, and taking measures to stabilize erosion from the gully	Tumwater		
Restore functional estuary processes	Tumwater	H	
Remove channel constrictions in the lower channel and restore functional floodplain processes	Tumwater	H	
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored	Tumwater	H	
Restore functional riparian zones throughout the watershed	Tumwater	H	
Remediate stormwater impacts to the channel; ensure that stormwater impacts resulting from future construction in the watershed are fully addressed at the time of construction	Dry		

Prevent further head-cutting in relocated reaches of Dry Creek	Dry	H	
Develop and implement a short term LWD strategy to provide LWD presence and habitat diversity until full riparian function is restored	Dry	H	
Restore functional riparian zones throughout the watershed	Dry	H	
Systematic restructuring of the lower and middle river with large wood	Elwha	H	
Removal of selected dikes and other channel constrictions	Elwha		
Riparian restoration	Elwha	H	
Acquisition/conservation easement access and set back of structures constructed within the channel migration zone	Elwha	H	