

Entiat Watershed Implementation Schedule
Upper Columbia Salmon Recovery Plan

Assessment Unit	ID #	Limiting Factor	Action Type	Specific Actions	Location	2008-2010	2011-2013	2014-2016	After Year 2017	Long-term	Units	Cost/Unit	Estimated Costs	Actual Costs	Biological Tier	Status (When, by whom and #s)
Lower Entiat	ER 1000	Sediment	Sediment Reduction	Road Reconstruction Road Relocation Road Stream Crossing Improvements Road Obliteration Sediment Control	Throughout Assessment Unit	Decommission 14 miles of NF roads (may be able to get 1-5 miles in 10 years if there is funding/staffing)	Implement	Complete		Roads & trails adequately maintained; relocated out of riparian areas or decommissioned where feasible.	miles		\$ 140,000			
Lower Entiat	ER 1010	Sediment	Sediment Reduction	Road Reconstruction Road Relocation Road Stream Crossing Improvements Road Obliteration Sediment Control	Throughout Assessment Unit	20 miles heavy maintenance - reconstruction on NF roads (1-10 mi in 10 years if have funding/staffing)	Implement	Complete			miles		\$ 200,000			
Lower Entiat	ER 1020	Depleted Nutrients	Nutrient Enrichment	Carcass Analog Carcass Placement	Throughout Assessment Unit	Initiate carcass and/or analog pilot program	Implement	Monitor, evaluate, adaptively manage	Monitor, evaluate, adaptively manage				\$ 12,000			
Lower Entiat	ER 1030	Water Quality	Water Quality Improvement	Planting Off-Channel Connection Instream Flow Actions Channel Reconfiguration (to reduce width depth ratio)	Throughout Assessment Unit	Implement actions identified in SNTMP study, EDT report, and Entiat River Inventory and Analysis to help moderate temperatures	See Habitat Diversity / Key Habitat and Riparian	See Habitat Diversity / Key Habitat and Riparian	See Habitat Diversity / Key Habitat and Riparian	Site-specific shade increased by or up to 50%; channel width-to-depth ratios decreased			\$ 10,000			
Lower Entiat	ER 1040	Water Quality	Off-Channel Wetlands	Wetland Improvement or Enhancement Wetland Restoration Wetland Invasive Species Removal	Throughout Assessment Unit	Provide information on wetland function and assistance options; Update NWI GIS data to reflect known, field checked wetlands	Continue mapping updates and implement wetlands projects as appropriate	Continue mapping updates and implement wetlands projects as appropriate	Continue mapping updates and implement wetlands projects as appropriate	To the extent possible, wetlands are delineated, mapped, rated and protected/enhanced.	acres		\$ 40,000			
Lower Entiat	ER 1050	Water Quality	Water Quality Improvement	Reduce Use of or Control Runoff of Pesticides, Road Chemicals, Fertilizers	Throughout Assessment Unit	Host workshop regarding pesticide use, federal court decisions, effects on BMPs, and Riparian Habitat Prioritization report	Continue use of BMPs	Continue use of BMPs	Continue use of BMPs	Best Management Practices used for all herbicide and pesticide applications			\$ 26,000			
Lower Entiat	ER 1060	Water Quality	Riparian Habitat	Livestock Exclusion Fencing Planting	Throughout Assessment Unit	Host info sessions on BMPs and assistance options; Develop baseline of existing fencing and farm plans; 1-2 new farm plans and fencing per year. Keystone, Harrison, and perhaps others identified in the Entiat Riparian Habitat Prioritization have riparian planting components.	1-2 new farm plans and fencing per year	1-2 new farm plans and fencing per year	1-2 new farm plans and fencing per year	All livestock fenced out of streams and alternative off-stream stock watering sites implemented, when/where feasible	miles		\$ 10,000			CCD has SRFB funds to complete Keystone, Harrison and WDFW property in 2008. CCD is submitting SRFB application in 2008 for wetland restoration on ENFH land

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Lower Entiat	ER 1070	Water Quality	Water Quality Improvement	Sewage/Septic Clean-Up	Throughout Assessment Unit	Not currently an issue based on available science	Evaluate DOE ambient data for change in water quality trends	Implement broad scale water quality sampling scheme	Identify opportunities for water quality improvement and implement as appropriate	Point and non-point sources (e.g. septic systems) identified and in compliance with current standards						
Lower Entiat	ER 1080	Water Quantity	Instream Flow	Change Point of Diversion Irrigation Practice Improvements	Throughout Assessment Unit	Continue Knapp-Wham and Hanan Detwiler irrigation ditch consolidation effort: Design and permit system; perform water rights administration; secure funding	Construction Complete	Potential formation of KW-HD irrigation district under Chapter 87.03 RCW	Ditches consolidated and potentially a new irrigation district	KW and HD systems consolidated for optimal conveyance (and distribution) efficiency			\$ 1,500,000			
Lower Entiat	ER 1100	Water Quantity	Instream Flow	Irrigation Practice Improvements	Throughout Assessment Unit	Roaring Ck surface to wells, PUD irrigation canal, and 10-12 other surface to well conversions identified by CCD.	Pursue other water conveyance efficiency and diversion improvements. Identify opportunities and implement as appropriate (up to 20 others currently identified)	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	All other ditches piped if feasible, and diversion structures at optimum design/efficiency			\$ 240,000			
Lower Entiat	ER 1110	Water Quantity	Instream Flow	Irrigation Practice Improvements	Throughout Assessment Unit	Host sessions on IWM, water-wise landscaping & assistance options (EQIP); Develop baseline of existing efficiencies and locations; 1-2 system upgrades per year.	1-2 system upgrades per year	1-2 system upgrades per year	1-2 system upgrades per year	All on-farm irrigation systems and practices are as efficient as possible.			\$ 700,000			
Lower Entiat	ER 1120	Water Quantity	Instream Flow	Irrigation Practice Improvements	Throughout Assessment Unit	Provide technical and cost-share assistance and host workshop about metering and available help; Install 1-3 meters per year	1-3 meters installed per year	1-3 meters installed per year	Continue implementation as appropriate	All surface water diversions, especially >1cfs, are metered and reporting			\$ 50,000			
Lower Entiat	ER 1130	Habitat Diversity	Instream	Channel Reconfiguration Rock Weir Boulders (boulder clusters) Deflectors or Barbs	Throughout Assessment Unit	10-15 structures per year	10-15 structures per year	5-10 structures per year	evaluate, adaptive management	End: Up to 65 rock and/or wood structures as identified in WRIA 46 Plan and supplemental analyses	structures		\$ 1,500,000			

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Lower Entiat	ER 1140	Habitat Diversity	Instream	Channel Reconfiguration Large Woody Debris Log Structure or Log Jam Rootwads	Throughout Assessment Unit	Implement EDT Alternative 5, focusing on pool forming structures. 1-3 structures per year	3-5 structures per year	3-5 structures per year	evaluate, adaptive management	End: Up to 65 rock and/or wood structures as identified in WRIA 46 Plan and supplemental analyses	structures		\$ 1,500,000			BLM, WDFW and USFS installed 2 ELJs at RM 10.3, 2 boulder barbs and root wads at RM 15 in 2001. NRCS, CCD, USFWS and BLM installed 2 cross vanes below fire state bridge, and additional structure above Dinkleman Canyon Rd bridge in 2001.
Lower Entiat	ER 1150	Habitat Diversity	Instream	Channel Connectivity Off-Channel Habitat	Throughout Assessment Unit	Implement Ecosystem Diagnosis and Treatment (EDT) Alternative 5 related to side-channel options: 1-2 reconnection projects (Phases II and III of B2B - Harrison; CCPUD Ditch; Hatchery; Moen)	1-2 reconnect projects (HD bypass)	1-2 reconnection projects	Complete	End: All potential (possibly 5) off-channel opportunities reconnected.	miles		\$ 750,000			
Lower Entiat	ER 1160	Habitat Diversity	Riparian Habitat	Planting Fencing Forestry Practices or Stand Management Weed Control	Throughout Assessment Unit	Utilize completed Riparian Habitat Prioritization Report to develop projects. Host workshops about the function / benefits of riparian vegetation and assistance programs; Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Implement Habitat Farming Enterprise Program. Riparian Planting (500 - 1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	End: ~30,000 lineal feet as identified in WRIA 46 Plan and supplemental analyses (SNTEMP, ground truthing, etc.)	acres		\$ 300,000			
Lower Entiat	ER 1170	Habitat Diversity	Land Protection, Acquisition, or Lease	Streambank Protection Upland Protection Wetland Protection	Throughout Assessment Unit	Share information on pilot IRIS initiative (HFEP), easement and habitat leasing programs, development right transfer options, etc.	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Identify opportunities and implement as appropriate	Larger undisturbed riparian areas are preserved in a manner that does not adversely impact community tax base			\$ 1,000,000			
Lower Entiat	ER 1180	Obstructions	Fish Screening	Fish Screen Replacement Fish Screen Installation	Throughout Assessment Unit	Screen and/or upgrade existing screens on pumps/diversions (Bill Small, Keystone, KW)	1-5 screening per year	1-5 screening per year	evaluate, adaptive management	All diversions/pumps screened appropriately.			\$ 300,000			

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Middle Entiat (Stillwater's)	ER 1190	Sediment	Sediment Reduction	Road Reconstruction Road Relocation Road Stream Crossing Improvements Road Obliteration Sediment Control	30 miles heavy maintenance - reconstruction on NF roads	up to 1 mile decommissioned in Potato Creek	Complete						\$ 600,000	\$ 415,000		USFS relocated South Mud Fork Creek Rd (#5340) in 2000. This included 1.95 miles of new road, 1.10 miles of road reconstructed and 1.85 miles of road obliterated. Also, in 2001, USFS relocated approximately 3 miles of Mud Creek Rd (#5300) and decommissioned another 3.9 miles. USFS spot seeding and mulching in 2 mile section of #5300 in 2003.
Middle Entiat (Stillwater's)	ER 1200	Water Quality	Water Quality Improvement	Reduce Use of or Control Runoff of Pesticides, Road Chemicals, Fertilizers (Mosquito control)	Throughout Assessment Unit	Public Meeting(s), education/outreach, BMPs (B.t., foggers, biocontrols)	evaluate, continue as appropriate	evaluate, continue as appropriate	evaluate, continue as appropriate							
Middle Entiat (Stillwater's)	ER 1210	Habitat Diversity	Off-Channel Wetlands	Wetland Improvement or Enhancement Wetland Restoration Wetland Invasive Species Removal	Throughout Assessment Unit	Provide information on wetland functions and assistance options; Update NWI GIS data to reflect known, field checked wetlands	Continue mapping updates and implement wetlands projects as appropriate (CDLT Cottonwood Off-channel connect)	Continue mapping updates and implement wetlands projects as appropriate (breach Tyee Ranch dike)	Continue mapping updates and implement wetlands projects as appropriate	To the extent possible, wetlands are delineated, mapped, rated and protected/enhanced.	studies		\$ 10,000			
Middle Entiat (Stillwater's)	ER 1220	Depleted Nutrients	Nutrient Enrichment	Carcass Analog Carcass Placement	Throughout Assessment Unit	Initiate carcass and/or analog pilot program	Implement	Monitor, evaluate, adaptively manage	Monitor, evaluate, adaptively manage	Monitor, evaluate, adaptively manage			\$ 12,000			
Middle Entiat (Stillwater's)	ER 1230	Water Quality	Water Quality Improvement	Planting Off-Channel Connection Instream Flow Actions Channel Reconfiguration	Throughout Assessment Unit	Implement actions identified in SNTMP study, EDT report, and Entiat River Inventory and Analysis to help moderate temperatures	See Habitat Diversity / Key Habitat and Riparian	See Habitat Diversity / Key Habitat and Riparian	See Habitat Diversity / Key Habitat and Riparian	Site-specific shade increased by or up to 50%; channel width-to-depth ratios decreased			\$ 1,000,000			

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Middle Entiat (Stillwater's)	ER 1240	Water Quality	Riparian Habitat	Livestock Exclusion Fencing Planting	Throughout Assessment Unit	Host info sessions on BMPs and assistance options; 3-15 riparian habitat enhancements per year (based on prioritization report); Develop baseline of existing fencing and farm plans; 1-2 new farm plans and fencing / other practices per year (Sego-Yurt; Riverwood Estates; CDLT)	3-15 riparian habitat enhancements per year; 1-2 new farm plans and fencing / other practices per year	3-15 riparian habitat enhancements per year; 1-2 new farm plans and fencing / other practices per year	Continue implementation as appropriate	All livestock fenced out of steams and alternative off-stream stock watering sites implemented, when/where feasible	miles		\$ 10,000			
Middle Entiat (Stillwater's)	ER 1250	Water Quality	Water Quality Improvement	Sewage/Septic Clean-Up	Throughout Assessment Unit	Not currently an issue based on available science, but this reach faces high development pressures. Evaluate results of Riparian Habitat Prioritization report.	Evaluate DOE ambient data for change in water quality trends	Implement broad scale water quality sampling scheme	Identify opportunities for water quality improvement and implement as appropriate	Point and non-point sources (e.g. septic systems) identified and in compliance with current standards			\$ 26,000			
Middle Entiat (Stillwater's)	ER 1260	Habitat Diversity	Instream	Rootwads Log Structure or Log Jam	Throughout Assessment Unit	Geomorphic Assessment must be complete to identify needs and opportunities	Fully implement EDT Alternative 5 - LWD installation at 2-3 priority Stillwater sites that were identified in 2005	3 - 5 structures per year	3 - 5 structures per year	End: Up to 10 wood structures as identified in WRIA 46 Plan and supplemental analyses	structures		\$ 500,000	\$ 198,000		USFS completed instream and bank treatments in Stormy, Potato, Mud and Indian Creek drainages in 1997. Also, installed 1300 ft of rootwad revetments and riparin plantings in 1997.
Middle Entiat (Stillwater's)	ER 1270	Habitat Diversity	Riparian Habitat	Planting Livestock Exclusion Weed Control	Throughout Assessment Unit	Host workshops about the function / benefits of riparian vegetation and assistance programs; Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	Riparian Planting (500 -1000 feet per year or 0.25 - 0.5 acres per year)	End: ~10,000 lineal feet as identified in WRIA 46 Plan and supplemental analyses (SNTMP, ground truthing, etc.)	acres		\$ 100,000			

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Middle Entiat (Stillwater's)	ER 1280	Habitat Diversity	Land Protection, Acquisition, or Lease	Streambank Protection Upland Protection Wetland Protection	Throughout Assessment Unit	Share information on pilot IRIS initiative (HFEP potential?), easement and habitat leasing programs, development right transfer options, etc. Identify opportunities and implement as appropriate (1-3 Conservation easements per year)	Identify opportunities and implement as appropriate (1-3 Conservation easements per year)	Identify opportunities and implement as appropriate (1-3 Conservation easements per year)	Identify opportunities and implement as appropriate	Larger undisturbed riparian areas are preserved in a manner that does not adversely impact community tax base			\$ 1,000,000			Chelan-Douglas Land Trust received SRFB grant to purchase riparian habitat property along mainstem Entiat in 2000 and in 2001.	
Middle Entiat (Stillwater's)	ER 1290	Water Quantity	Instream Flow	Water Leased or Purchased Irrigation Practice Improvements, <i>Water storage-flow augmentation</i>	Throughout Assessment Unit	Host sessions on Irrigation Water Management and Water Rights, water-wise landscaping & assistance options; Develop baseline of existing efficiencies and locations; 1-2 system upgrades per year (CDLT - Cottonwood)	1-2 system upgrades per year	1-2 system upgrades per year	Continue implementation as appropriate	All on-farm irrigation systems and practices are as efficient as possible.			\$ 600,000				
Middle Entiat (Stillwater's)	ER 1300	Water Quantity	Instream Flow	Irrigation Practice Improvements	RM 16 - RM 24	Develop a plan for outreach to accomplish conversions in outyears	1-2 well conversions per year. McKenzie ditch and Stormy Ck. (up to 12 users)	1-2 well conversions per year	1-2 well conversions per year	All surface water pumps converted to wells when/where feasible			\$ 600,000				
Middle Entiat (Stillwater's)	ER 1310	Obstructions (Stormy Creek)	Fish Passage	Culvert Improvements or Upgrades	Stormy Creek	Initiate discussion with landowner and USFS to replace 2 Stormy Creek culverts; collect passage data	Design, Permit and complete 2 Stormy culvert replacements			Passage at 2 Stormy Creek culverts upstream of County bridge	structures		\$ 150,000			USFS and CCNRD initiated discussion with landowner in 2006	
Upper Entiat	ER 1320	Species Interactions	Reduce or Eliminate Negative Species Interactions	Reduce or Eliminate Brook Trout	Above Entiat Falls	Evaluate presence/absence of bull trout above Entiat Falls	Implement as appropriate	Implement as appropriate	Implement as appropriate		studies		\$ 30,000			USFS conducted snorkel surveys (Peterson, et al) and confirmed no bull trout presence	
Upper Entiat	ER 1330	Species Interactions	Reduce or Eliminate Negative Species Interactions	Reduce or Eliminate Brook Trout	Myrtle Lake	Eliminate brook trout in Myrtle Lake in cooperation with WDFW	Eliminate brook trout in Myrtle Lake in cooperation with WDFW	Eliminate brook trout in Myrtle Lake in cooperation with WDFW									
Upper Entiat	ER 1340	Habitat Diversity	Instream	Spawning Gravel Placement Channel Connectivity	Below Entiat Falls	Treatments in spawning channel	Monitor and maintain									USFS restored approximately .25 mile of spawning channel in 1999.	

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Mad River	ER 1350	Habitat Diversity / Key Habitat	Sediment Reduction	Road Obliteration	Throughout Assessment Unit		Estimate 40 miles decommission/heavy maintenance / reconstruction in assessment unit				miles		\$ 40,000			
Mad River	ER 1360	Habitat Diversity / Key Habitat	Sediment Reduction	Sediment Control Road Reconstruction Road Drainage System Improvements	Mainstem	12 miles heavy maintenance reconstruction					miles		\$ 240,000			
Mad River	ER 1370	Habitat Diversity / Key Habitat	Sediment Reduction	Road Obliteration Sediment Control Road Reconstruction Road Drainage System Improvements	Tillicum		Estimate 40 miles decommission/heavy maintenance / reconstruction in Tillicum watershed				miles		\$ 400,000			
Mad River	ER 1380	Habitat Diversity / Key Habitat	Water Quality Improvement	Reduce Use of or Control Runoff of Pesticides, Road Chemicals, Fertilizers	Lower 4 miles	Partner with Chelan County Public Works to address road maintenance issues	Implement priorities	Continue program	Continue program	Side-casting of materials resulting from lower Mad River road maintenance is eliminated	miles		\$ 50,000			
Mad River	ER 1390	Habitat Diversity	Riparian Habitat	Livestock Exclusion Fencing Planting	Tillicum fan and Indian fan	Install ~.5 mile of livestock fencing; install riparian plants along exclusion	Continue riparian planting				miles		\$ 240,000			USFS installed riparian plantings at Tillicum Fan in 1997. CCD built (with WCC crew help) fencing with funds from BPA
Mad River	ER 1400	Habitat Diversity / Key Habitat	Instream	Channel Reconfiguration	Lower 4 miles	Design and permit rock gravel recruitment structures	Install rock gravel catchers to promote gravel recruitment	1-2 structures per year		5-10 structures in 20 years	structures		\$ 120,000			