

**APPENDIX M**

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**Habitat Factors and Actions**

**Table M-1. Limiting Factors and Key Actions at Population Level**

<b>ESU: Mid Columbia Steelhead</b>		
<i>Major Population Grouping: Umatilla/Walla Walla</i>		
<b>Populations</b>	<b>Limiting Factor</b>	<b>Key Actions</b>
Walla Walla	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Large Woody Debris	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD
	Riparian Function	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Stream Flow	Irrigation efficiency, lease water, develop water storage systems, shallow aquifer recharge, develop/protect wetlands
Touchet	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Riparian Function	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Large Woody Debris	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Stream Flow	Irrigation efficiency, lease water, develop water storage systems, shallow aquifer recharge, develop/protect wetlands

ESU: Snake River Steelhead

*Major Population Grouping: Lower Snake Mainstem Tributaries*

<b>Populations</b>	<b>Limiting Factor</b>	<b>Key Actions</b>
Tucannon River	Riparian Function	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
Penawawa Creek		
Alkali Flat Creek		
Deadman Creek	Large Woody Debris	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD
Meadow Creek		
Palouse River	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
Asotin Creek	Large Woody Debris	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD
Almota Creek		
Tenmile Creek	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
Steptoe Creek		
Couse Creek		
Alpowa Creek	Bed Scour	modify stream geometry, set levees back, remove levees
Wawawai Creek	Riparian Function	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization, continue CRP, implement direct seed, reforest timberlands

*Major Population Grouping: Grande Ronde/Imnaha*

Lower Grande Ronde tribs	Stream Flow	No actions are identified because low flows are attributed to natural conditions. Actions to improve uplands and riparian zone should improve stream flow slightly
Wenaha River		
Rattlesnake Creek	Habitat Diversity	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD and promote diverse habitat conditions
Bufford Creek		
Grouse Creek	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
Menatchee Creek		
Bear Creek		
Cottonwood Creek	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
Deer Creek		

Joseph Creek	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Habitat Diversity	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD and promote diverse habitat conditions
	Stream Flow	Irrigation efficiency, lease water, develop water storage systems, shallow aquifer recharge, develop/protect wetlands
<b>ESU: Snake River Spring/Summer Chinook</b>		
Major Population Grouping: Lower Snake River Mainstem Tributaries		
Tucannon	Riparian Function	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Large Woody Debris	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD
	Channel Confinement	Modify stream geometry, set levees back, remove levees
	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
Asotin	Large Woody Debris	Restore and Protect Riparian Zone, place LWD in stream, modify stream geometry to retain LWD
	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Bed Scour	modify stream geometry, set levees back, remove levees
	Riparian Function	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization, continue CRP, implement direct seed, reforest timberlands
<i>Major Population Grouping: Grande Ronde/Imnaha</i>		
Grande Ronde	Habitat Diversity	The vast majority of spring Chinook spawning and rearing in the Grande Ronde occurs outside Washington so the Snake River Plan did not develop actions for Oregon.
	Stream Flow	
Wenaha River	Habitat Diversity	Protect existing conditions to promote natural improvement
	Substrate Embeddedness	Protect existing conditions to promote natural improvement
	Large Woody Debris	Protect existing conditions to promote natural improvement

Joseph Creek	Substrate Embeddedness	Continue CRP, implement direct seed, reforest timberlands, control noxious weeds, restore public road right of ways by converting them to perennial grass
	Water Temperature	Restore and Protect Riparian Zone by CREP, livestock fences and alternative water development, riparian easements, soft bank stabilization
	Habitat Diversity	Modify stream geometry, set levees back, remove levees, install LWD and bioengineered habitat
<b>ESU: Snake River Fall Chinook</b>		
<i>Major Population Grouping: Snake River and tributaries</i>		
Snake River	Harvest	The Snake River did not identify actions for fall Chinook because the tributary actions for spring/summer Chinook and steelhead will address the limiting factors for fall Chinook where they currently spawn in the Tucannon, Asotin and Grande Ronde. The remaining spawning/rearing occurs in the mainstem so the plan defers to the BioP on mainstem operations / actions and to the harvest managers for harvest actions.
	Estuary	
	Habitat Diversity	
	Stream Flow	
	Substrate Embeddedness	
	Habitat Diversity	

**Table M-2**

<b>ESU: Snake River Spring/Summer Chinook</b>			
Major Grouping: Lower Snake Mainstem Tributaries			
Population: Tucannon River			
MSA: Tucannon River			
<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Riparian Function (I)	40 to 75 % of maximum extent and function	Improve Riparian Areas	Implement 300 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 5 miles of channel geometry Install bioengineered instream habitat at 45 sites Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris

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**ESU: Snake River Spring/Summer Chinook**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Tucannon River

MSA: Tucannon River

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
		Improve Water Quantity	Protect/Develop 7 acres of wetlands Develop 150 acre-feet of new water storage Recharge shallow aquifer at 5 sites Implement 150 acres of irrigation efficiency Purchase/lease 10 cfs of water rights
Large Woody Debris (II)	1 or more pieces per channel width	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
Channel Confinement (III)	25 to 50 % of streambank length	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
Water Temperature (IV)	No more than 4 days above 72°	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Snake River Spring/Summer Chinook**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Asotin Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Large Woody Debris (I)	1 to 2 pieces per channel width	Improve Riparian Areas	Implement 1,500 acres of new CREP Implement 1,500 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 8 miles of channel geometry Install bioengineered instream habitat at 45 sites Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
Embeddedness (II)	Less than 20% embeddedness	Improve uplands	Future enrollment in CRP program Maintain roads/ditches Implement 3,000 acres of new CRP-like program Direct seed 7,500 acres Reforest 750 acres of timberland Convert 15,000 of annual crops to perennial Install 450 acres of grass waterways Install 75 water control structures Install 75 new sediment basins

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**ESU: Snake River Spring/Summer Chinook**

Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Asotin Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
			Control 1,500 acres of upland noxious weeds
			Protect/Restore 150 acres of road right of ways
			Relocate 6 miles of road
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Water Quantity	Protect/Develop 7 acres of wetlands
			Develop 150 acre-feet of new water storage
			Recharge shallow aquifer at 5 sites
			Implement 150 acres of irrigation efficiency
			Purchase/lease 10 cfs of water rights
Bed Scour (III)	Reduce to less than 10cm	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve uplands	(Actions listed above under the "Improve uplands" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
Riparian Function (IV)	75 to90 % of maximum extent and function	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain

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**ESU: Snake River Spring/Summer Chinook**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Asotin Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
		Improve Riparian Areas	Function” strategy) (Actions listed above under the “Improve Riparian Areas” strategy)
		Improve Water Quantity	(Actions listed above under the “Improve Water Quantity” strategy)

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**ESU: Snake River Spring/Summer Chinook**

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Major Grouping: Grande Ronde

Population: Wenaha River

MSA: Wenaha River

The vast majority of the Wenaha River lies entirely within a wilderness area administered by the USFS. The proposed action for this river is to continue protective status.

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Tucannon River

MSA: Upper Tucannon

<b>Key Habitat Factor (Priority Ranking)</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Riparian Function (I)	40 to75 % of maximum extent and function	Improve Riparian Areas	Implement 300 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 5 miles of channel geometry Install bioengineered instream habitat at 45 sites

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Tucannon River

MSA: Upper Tucannon

<b>Key Habitat Factor (Priority Ranking)</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Large Woody Debris (II)	1 or more pieces per channel width	Improve Water Quantity	Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris Protect/Develop 7 acres of wetlands Develop 150 acre-feet of new water storage Recharge shallow aquifer at 5 sites Implement 150 acres of irrigation efficiency Purchase/lease 10 cfs of water rights
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
Channel Confinement (III)	25 to 50 % of streambank length	Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
Water Temperature (IV)	No more than 4 days above 72°	Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Asotin Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Large Woody Debris (I)	1 to 2 pieces per channel width	Improve Riparian Areas	Implement 1,500 acres of new CREP Implement 1,500 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 8 miles of channel geometry Install bioengineered instream habitat at 45 sites Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
Embeddedness (II)	Less than 20% embeddedness	Improve uplands	Future enrollment in CRP program Maintain roads/ditches Implement 3,000 acres of new CRP-like program Direct seed 7,500 acres Reforest 750 acres of timberland Convert 15,000 of annual crops to perennial Install 450 acres of grass waterways Install 75 water control structures

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**ESU: Snake River Steelhead**

Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Asotin Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
			Install 75 new sediment basins
			Control 1,500 acres of upland noxious weeds
			Protect/Restore 150 acres of road right of ways
		Improve Riparian Areas	Relocate 6 miles of road (Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Water Quantity	Protect/Develop 7 acres of wetlands Develop 150 acre-feet of new water storage Recharge shallow aquifer at 5 sites Implement 150 acres of irrigation efficiency Purchase/lease 10 cfs of water rights
Bed Scour (III)	Reduce to less than 10cm	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve uplands	(Actions listed above under the "Improve uplands" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Asotin Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Riparian Function (IV)	75 to 90 % of maximum extent and function	<p>Improve Channel and Floodplain Function</p> <p>Improve Riparian Areas</p> <p>Improve Water Quantity</p>	<p>(Actions listed above under the "Improve Channel and Floodplain Function" strategy)</p> <p>(Actions listed above under the "Improve Riparian Areas" strategy)</p> <p>(Actions listed above under the "Improve Water Quantity" strategy)</p>

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: George Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Embeddedness (I)	Less than 10% embeddedness	Improve uplands	<p>Future enrollment in CRP program</p> <p>Maintain roads/ditches</p> <p>Implement 3,000 acres of new CRP-like program</p> <p>Direct seed 15,000 acres</p> <p>Reforest 750 acres of timberland</p> <p>Convert 3,000 of annual crops to perennial</p> <p>Install 450 acres of grass waterways</p> <p>Install 75 water control structures</p> <p>Install 75 new sediment basins</p> <p>Control 1,500 acres of upland noxious weeds</p> <p>Protect/Restore 150 acres of road right of ways</p>

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: George Creek

Key Habitat Factor	Habitat Objective	Prioritized Strategy	Identified Actions (15 years)
		Improve Riparian Areas	Relocate 1.5 miles of road Implement 1,500 acres of new CREP Implement 1,500 acres of new CREP-like programs Enroll 150 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 150 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 7.5 miles of channel geometry Install bioengineered instream habitat at 45 sites Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris
		Improve Water Quantity	Protect/Develop 6 acres of wetlands Develop 150 acre-feet of new water storage Recharge shallow aquifer at 5 sites Purchase 1.5 cfs of water rights
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
Large Woody Debris (II)	1 piece per channel width	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: George Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Riparian Function (III)	Greater than 75 % of maximum extent and function	Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
Water Temperature (IV)	No more than 1 days above 70°F	Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Alpowa Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Large Woody Debris (I)	1 to 2 pieces per channel width	Improve Riparian Areas	Implement 1,500 acres of new CREP Implement 1,500 acres of new CREP-like programs Enroll 300 acres in conservation easements

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Alpowwa Creek

Key Habitat Factor	Habitat Objective	Prioritized Strategy	Identified Actions (15 years)
Embeddedness (II)	Less than 20% embeddedness	Improve Channel and Floodplain Function	Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank Modify 8 miles of channel geometry Install bioengineered instream habitat at 45 sites Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve uplands	Future enrollment in CRP program Maintain roads/ditches Implement 3,000 acres of new CRP-like program Direct seed 7,500 acres Reforest 750 acres of timberland Convert 15,000 of annual crops to perennial Install 450 acres of grass waterways Install 75 water control structures Install 75 new sediment basins Control 1,500 acres of upland noxious weeds Protect/Restore 150 acres of road right of ways Relocate 6 miles of road

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Alpowa Creek

Key Habitat Factor	Habitat Objective	Prioritized Strategy	Identified Actions (15 years)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Water Quantity	Protect/Develop 7 acres of wetlands Develop 150 acre-feet of new water storage Recharge shallow aquifer at 5 sites Implement 150 acres of irrigation efficiency Purchase/lease 10 cfs of water rights
Bed Scour (III)	Reduce to less than 10cm	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve uplands	(Actions listed above under the "Improve uplands" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
Riparian Function (IV)	75 to90 % of maximum extent and function	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)

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**ESU: Snake River Steelhead**

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Major Grouping: Lower Snake Mainstem Tributaries

Population: Asotin Creek

MSA: Alpowa Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Snake River Steelhead**

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Major Grouping: Grande Ronde

Population: Lower Grande Ronde

MSA: Wenaha River

The vast majority of the Wenaha River lies entirely within a wilderness area administered by the USFS. The proposed action for this river is to continue protective status.

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**ESU: Snake River Steelhead**

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Major Grouping: Grande Ronde

Population: Joseph Creek

MSA: Joseph Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Large Woody Debris (l)	1 to 2 pieces per channel width	Improve Riparian Areas	Implement 1,500 acres of new CREP Implement 1,500 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 8 miles of channel geometry Install bioengineered instream habitat at 45 sites

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**ESU: Snake River Steelhead**

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Major Grouping: Grande Ronde

Population: Joseph Creek

MSA: Joseph Creek

Key Habitat Factor	Habitat Objective	Prioritized Strategy	Identified Actions (15 years)
Embeddedness (II)	Less than 20% embeddedness	Improve Instream Habitat	Set 4,500 feet of levees back
			Add 3,000 linear feet of large woody debris
		Improve uplands	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
			Future enrollment in CRP program
			Maintain roads/ditches
			Implement 3,000 acres of new CRP-like program
			Direct seed 7,500 acres
			Reforest 750 acres of timberland
			Convert 15,000 of annual crops to perennial
			Install 450 acres of grass waterways
Improve Riparian Areas	Install 75 water control structures		
	Install 75 new sediment basins		
	Control 1,500 acres of upland noxious weeds		
Improve Channel and Floodplain Function	Protect/Restore 150 acres of road right of ways		
	Relocate 6 miles of road (Actions listed above under the "Improve Riparian Areas" strategy)		
Improve Water Quantity	Protect/Restore 150 acres of road right of ways		
	Relocate 6 miles of road (Actions listed above under the "Improve Channel and Floodplain Function" strategy)		
			Protect/Develop 7 acres of wetlands
			Develop 150 acre-feet of new water storage

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**ESU: Snake River Steelhead**

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Major Grouping: Grande Ronde

Population: Joseph Creek

MSA: Joseph Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Bed Scour (III)	Reduce to less than 10cm	Improve Channel and Floodplain Function	Recharge shallow aquifer at 5 sites Implement 150 acres of irrigation efficiency Purchase/lease 10 cfs of water rights (Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve uplands	(Actions listed above under the "Improve uplands" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
Riparian Function (IV)	75 to 90 % of maximum extent and function	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Walla Walla

MSA: Mainstem Walla Walla

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Riparian Function	40 to 90 % of maximum extent and function	<p>Improve Riparian Areas</p> <p>Improve Channel and Floodplain Function</p> <p>Improve Water Quantity</p>	<p>Implement 4,500 acres of new CREP</p> <p>Implement 825 acres of new CREP-like programs</p> <p>Enroll 300 acres in conservation easements</p> <p>Exclude livestock at 30 sites</p> <p>Control riparian noxious weeds on 300 acres</p> <p>Stabilize 7,500 feet of streambank</p> <p>Modify 8 miles of channel geometry</p> <p>Install bioengineered instream habitat at 150 sites</p> <p>Set 15,000 feet of levees back</p> <p>Add 7,500 linear feet of large woody debris</p> <p>Protect/Develop 18 acres of wetlands</p> <p>Develop 750 acre-feet of new water storage</p> <p>Recharge shallow aquifer at 15 sites</p> <p>Implement 2,250 acres of irrigation efficiency</p> <p>Purchase/lease 152 cfs of water rights</p>
Large Woody Debris	0.5 to 1 pieces per channel width	<p>Improve Channel and Floodplain Function</p> <p>Improve Riparian Areas</p> <p>Improve Instream Habitat</p>	<p>(Actions listed above under the "Improve Channel and Floodplain Function" strategy)</p> <p>(Actions listed above under the "Improve Riparian Areas" strategy)</p> <p>Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)</p>

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Walla Walla

MSA: Mainstem Walla Walla

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Channel Confinement	40 to 60 % of streambank length	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
Water Temperature	No more than 4 days above 72°F	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
Embeddedness	Less than 10% embeddedness	Improve uplands	Implement 15,000 acres of new CRP-like program Direct seed 15,000 acres Reforest 750 acres of timberland Convert 15,000 of annual crops to perennial Install 1,500 acres of grass waterways Install 225 water control structures Install 15 new sediment basins Control 1,500 acres of upland noxious weeds Protect/Restore 150 acres of road right of ways Relocate 6 miles of road Continue CRP enrollment in future Maintain roads/ditches

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Major Grouping: Walla Walla

Population: Walla Walla

MSA: Mainstem Walla Walla

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Walla Walla

MSA: Mill Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Water Temperature	Protect existing condition	Improve Channel and Floodplain Function	Modify 8 miles of channel geometry Install bioengineered instream habitat at 150 sites Set 15,000 feet of levees back Add 7,500 linear feet of large woody debris
		Improve Riparian Areas	Implement 750 acres of new CREP Implement 300 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 30 sites Control riparian noxious weeds on 300 acres Stabilize 7,500 feet of streambank

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Walla Walla

MSA: Mill Creek

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Large Woody Debris	Protect existing condition	Improve Water Quantity	Protect/Develop 18 acres of wetlands Recharge shallow aquifer at 15 sites Implement 150 acres of irrigation efficiency Purchase/lease 17 cfs of water rights
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
Riparian Function	Protect existing condition	Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Touchet

MSA: Middle Touchet

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Embeddedness	Less than 10% embeddedness	Improve uplands	Enroll 1,500 acres in CRP program Maintain roads/ditches Implement 7,500 acres of new CRP-like program Direct seed 3,000 acres Convert 3,000 of annual crops to perennial Install 450 acres of grass waterways Install 150 water control structures Install 15 new sediment basins Control 15,000 acres of upland noxious weeds Protect/Restore 75 acres of road right of ways Relocate 2 miles of road
		Improve Riparian Areas	Implement 300 acres of new CREP Implement 750 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 15 sites Control riparian noxious weeds on 300 acres Stabilize 4,500 feet of streambank
		Improve Channel and Floodplain Function	Modify 5 miles of channel geometry Install bioengineered instream habitat at 45 sites Set 4,500 feet of levees back Add 3,000 linear feet of large woody debris
		Improve Water Quantity	Protect/Develop 7 acres of wetlands

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Touchet

MSA: Middle Touchet

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Water Temperature	No more than 4 days above 72°F	Improve Channel and Floodplain Function	Recharge shallow aquifer at 5 sites Implement 150 acres of irrigation efficiency Purchase/lease 10 cfs of water rights (Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
Large Woody Debris	1 piece per channel width	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)
Channel Confinement	15 to 40 % of streambank length	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Touchet

MSA: Upper Touchet

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Water Temperature	No more than 4 days above 72°F	Improve Channel and Floodplain Function	Modify 8 miles of channel geometry Install bioengineered instream habitat at 150 sites Set 3,000 feet of levees back Add 6,000 linear feet of large woody debris
		Improve Riparian Areas	Implement 300 acres of new CREP Implement 750 acres of new CREP-like programs Enroll 300 acres in conservation easements Exclude livestock at 30 sites Control riparian noxious weeds on 8,400 acres Stabilize 7,500 feet of streambank
Large Woody Debris	1 to 2 pieces per channel width	Improve Water Quantity	Protect/Develop 13 acres of wetlands Recharge shallow aquifer at 15 sites Implement 75 acres of irrigation efficiency Purchase/lease 10 cfs of water rights
		Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Instream Habitat	Redundant to the instream actions listed under the "Improve Channel and Floodplain Functions" strategy)

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**ESU: Mid-Columbia River Steelhead**

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Major Grouping: Walla Walla

Population: Touchet

MSA: Upper Touchet

<b>Key Habitat Factor</b>	<b>Habitat Objective</b>	<b>Prioritized Strategy</b>	<b>Identified Actions (15 years)</b>
Riparian Function	62 to 82 % of maximum extent and function	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)
		Improve Water Quantity	(Actions listed above under the "Improve Water Quantity" strategy)
Channel Confinement	10 to 40 % of streambank length	Improve Channel and Floodplain Function	(Actions listed above under the "Improve Channel and Floodplain Function" strategy)
		Improve Riparian Areas	(Actions listed above under the "Improve Riparian Areas" strategy)

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