

NOTES:

This workbook contains **habitat functions** data downloaded directly from the Taurus database. Functions include those documented during the **Look Back** process covering the **2012-2015** work window for steelhead.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lochsa River	LAS1A	Upper Lochsa Tributaries - Postoffice to Parachute Creeks	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	85	85	85.6	100	95	100	Level of certainty = 2; Sources = 5, 7	2012:Actions are on USFS land and may be a few remaining, but majority of opportunity is on private land (checker board). Installed log weir structures (circa 1990) are potential barriers in several streams. Inventory will be complete by 2012. Begin addressing in 2013 and until done. 2015: 2016 Expert Panel assessed on full barrier project that was completed during the 2012-2015 timeframe, and it opened 0.5 miles of stream habitat, but was prorated for only juvenile rearing use (50%). Uplift was calculated relative to fish distribution in the Assessment Unit: Expert Panel modified values from Streamnet, which indicated 33 miles of fish use. Based on local knowledge, the following river miles were added to the fish distribution estimate: 4 miles of Badger Creek, 2 miles 12in Upper Waw'aalamnima, 0.5 mile on Spring, and 1 mile in Upper Doe. All totaled, fish use in the Assessment Unit = 41 miles. Therefore 0.25 (0.5/2) /41=0.6% benefit. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS1A	Upper Lochsa Tributaries - Postoffice to Parachute Creeks	4.2: Riparian Condition: LWD Recruitment	25.00%	66	66	66.2	70	68	72	Level of certainty = 3; Sources = 5, 6 (Due to past timber harvest)	2012:LF weight due to past timber harvest and fire activities. Currently inventorying installed log weirs and wood in all streams. Plan to address installed weirs for passage and install wood in all streams as appropriate, starting in 2013. 2015:The 108 Road Relocation Waw'aalamnima 2015 project was undertaken because the road was impinging on floodplain, causing road failure. Road was relocated to upland, and large wood was added to floodplain. 670 feet (0.13 miles) of stream impacted. Expect 50% function by 2018, resulting in 0.2% uplift (0.13/2=0.06/41=0.2%). EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS1A	Upper Lochsa Tributaries - Postoffice to Parachute Creeks	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	70	70	70.2	77	70	80	Level of certainty = 4; Sources = 5, 6	2012;Installation of wood addressed in LF 4.2 will address this LF. 2015: Expert Panel used same rationale as for limiting factor 4.2:The 108 Road Relocation Waw'aalamnima 2015 project was undertaken because the road was impinging on floodplain, causing road failure. Road was relocated to upland, and large wood was added to floodplain. 670 feet (0.13 miles) of stream impacted. Expect 50% function by 2018, resulting in 0.2% uplift (0.13/2=0.06/41=0.2%). EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS1A	Upper Lochsa Tributaries - Postoffice to Parachute Creeks	7.2: Sediment Condition s: Increased Sediment Quantity	25.00%	62	62	63.5	75	64	77	Level of certainty = 3; Sources = 5, 6	2012: Use LiDAR data to determine extent of existing road network. Plan to decommission roads based on that data. 2015: Nine projects were evaluated and weighted by landscape position (e.g., 90% for streamside roads) and total possible benefit (accounting for other human sediment sources). Planting was associated with road decommissioning projects. Expert Panel revised their original estimate with additional project information to include mid-slope weed control (knapweed) actions associated with road project, but assigned a lower weight relative to other efforts. Expert Panel assumed that road drainage improvement projects reduce sediment contributions downstream, even if located upland. Soil at deep fill culvert project was not properly compacted at construction, so there was less benefit assigned than what was initially discussed (Panel adjusted weight accordingly. Planting projects helped, but overall had negligible benefit. From 1996 to 2011: lots of
Snake River Steelhead	Lochsa River	LAS1A	Upper Lochsa Tributaries - Postoffice to Parachute Creeks	8.1: Water Quality: Temperature	15.00%	80	80	80	88	82	90	Level of certainty = 3; Sources = 1, 6 (Doesn't meet state standards, highly functional)	2012: Benefits from Riparian actions; wood installation (LF 4.2) will indirectly impact this LF. 2015: The Expert Panel assessed that planting activities will have had no measureable benefit, therefore, there is no change to the low bookend. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS2A	Lower Colt Killed Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	65	65	65.6	100	66	100	Level of certainty = 3; Sources = 5, 7 (Walton Creek fish weir and water intake)	2012: Opportunity to address this LF on checkerboard/private lands. 2015: One project (Alkire Creek Culvert Replacement) occurred in this Assessment Unit to address barriers. The full barrier removal opened 0.5 miles of upstream habitat, but was prorated 50% because it was a barrier for juveniles only. Relative to the 40.7 miles of stream with fish in the Assessment Unit (30.2 steelhead miles per Streamnet. Plus, 2 miles on Cabin Creek, 2.5 miles on Beaver Creek, 1 mile on Alkire, 2 miles on Walton, and 3 miles on Savage, the Expert Panel added based on their knowledge of fish in the area). Therefore (0.5/2)/40.7=0.6% change. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS2A	Lower Colt Killed Creek	7.2: Sediment Conditions: Increased Sediment Quantity	80.00%	55	55	55.5	70	60	72	Level of certainty = 5; Sources = 6	2012: Opportunity to address this LF on checkerboard/private lands. LiDAR data will be use to identify projects in the future. 2015: Studies show that upland knotweed increases sediment yield/input to streams when converted from bunchgrass, so controlling weed benefits this limiting factor. But this treatment was measured in acres, not stream miles. Expert Panel weighted the treatment by type of landscape position, and scale of potential benefit to all fish bearing streams in the assessment unit (40.7 miles). With weightings and including an additional project, total stream miles affected = 0.2215. Relative to fish bearing streams in the entire Assessment Unit, project mprovements resulted in 0.5%. EWL

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Snake River Steelhead	Lochsa River	LAS2A	Lower Colt Killed Creek	8.1: Water Quality: Temperature	15.00%	70	70	70	80	70.5	82	Level of certainty = 3; Sources = 2, 6 (Doesn't meet state standards)	2012:benefits from sediment projects 2015: There were no actions to address this limiting factor, therefore, no change from low bookend. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS2B	Big Sand Creek	8.1: Water Quality: Temperature	100.00%	95	95	95	95	95	95		2012: No actions; wilderness No actions during 2012-2015 for this limiting factor, therefore no change to low bookend. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS3A	Crooked Fork	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	65	65	65	100	70	100	Level of certainty = 3; Sources = 5, 7	2012:There are currently 12 known passage barriers in this AU. 3 will be replaced in 2013. 2015:Three Pack bridge projects occurred during 2012-2015, however, these were not barriers to steelhead (there is a natural barrier near the mouth of Pack Creek that blocks passage upstream). Therefore, there was no change from the low bookend. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS3A	Crooked Fork	4.2: Riparian Condition: LWD Recruitment	35.00%	50	50	50	55	50	60	Level of certainty = 4; Sources = 5, 6	2012: No projects currently planned. 2015: No actions were undertaken during the 2012-2015 timeframe, therefore there was no change from the Low Bookend. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS3A	Crooked Fork	6.2: Channel Structure and Form: Instream Structural Complexity	35.00%	45	45	45	50	45	55	Level of certainty = 4; Sources = 5, 6	2012: No projects currently planned. 2015: No actions were undertaken during the 2012-2015 timeframe, therefore there was no change from the Low Bookend. EWL 3.7.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lochsa River	LAS3A	Crooked Fork	7.2: Sediment Conditions: Increased Sediment Quantity	20.00%	45	45	53.1	70	55	75	Level of certainty = 3; Sources = 5, 6	2012: Most of the problem on private land; some actions proposed on USFS land. Weed treatment and tree planting on decommissioned roads will address this LF. 2015: Studies show that upland knotweed increases sediment yield/input to streams when converted from bunchgrass, so controlling weed benefits this limiting factor. Weightings accounted for landscape position (e.g., upland road v riparian road) and realization of potential benefit from action. Weed control was valued at 1% of miles treated from total benefit possible. Panel added a project on day 2 of the meetings and the uplift changed from 5.8% to 8.1%. The calculation was derived through adding the weighted stream miles affected (2.7) and dividing by total fish bearing stream miles in the Assessment Unit =33.4; calculated using Streamnet and modified with local knowledge of fish use). Therefore $2.7/33.4 \times 100 = 8.1\%$ Improvement for this limiting factor. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS3A	Crooked Fork	8.1: Water Quality: Temperature	5.00%	50	50	50	55	51	57	Level of certainty = 3; Sources = 3 (Doesn't meet state standards)	2012: Benefits from sediment projects 2015: Expert Panel determined no measureable benefit from the one project listed for this limiting factor or from the cumulative effects from the projects listed under limiting factor 7.2. Therefore, there was no change from the Low Bookend. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS3B	Upper Crooked Fork/Boulder Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	85	85	85	100	85	100	Level of certainty = 2; Sources = 5, 7	2012:LiDAR data will be use to identify projects in the future. 2015: No actions were undertaken during 2012-2015, therefore there was no change from Low Bookend. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS3B	Upper Crooked Fork/Boulder Creek	7.2: Sediment Conditions: Increased Sediment Quantity	95.00%	70	70	70.6	80	70	82	Level of certainty = 3; Sources = 6 (Mostly from natural sources (fire))	2012:LiDAR data will be use to identify projects in the future. Weed treatment and tree planting on decommissioned roads will address this LF. 2015:Two projects were undertaken and weighted by their position on the landscape (e.g., upland versus riparian) and the potential benefits that could be realized through 2018. The overall benefits of the actions were measured relative to all fish bearing stream miles in the Assessment Unit. The Expert Panel chose to use Streamnet mileage as a proxy for total fish bearing stream miles =19.3. Therefore $0.12/19.3 \times 100 = 0.6\%$ uplift. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS6	Lochsa Mainstem	4.1: Riparian Condition: Riparian Vegetation	60.00%	85	85	85	87	85	90	Level of certainty = 3; Sources = 5, 6	2012: The upper 30 miles of the Lochsa River mainstem is very simplified. This is due in part to Hwy 12 preventing wood recruitment (as well as headwater streams (Crooked and Brushy Forks) being heavily logged in the past. Therefore, we are beginning to investigate the installation of large wood into the mainstem Lochsa in this section. 2015: There were no actions undertaken during the 2012-2015 timeframe to address this limiting factor. Therefore, no change from Low bookend. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS6	Lochsa Mainstem	7.2: Sediment Conditions: Increased Sediment Quantity	35.00%	75	75	76.7	90	78	78	Level of certainty = 3; Sources = 3, 5, 6	2012: benefits from actions in other assessment units 2015: In addition to the invasive weed treatment actions occurring in this Assessment Unit (stream miles treated adjusted by weightings for landscape position and overall benefit through 2018; =0.5% uplift), the Expert Panel considered cumulative effects from projects in all upstream assessment units (2.3%) with a 50% weighting factor applied. Thus, 0.5%+2.3%50%=1.7%. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS6	Lochsa Mainstem	8.1: Water Quality: Temperature	5.00%	85	85	85	87	87	88	Level of certainty = 3; Sources = 3, 5, 6 (Doesn't meet state standards; TMDL completed- viewed as natural condition, No TMDL established)	2012: Benefits from actions in other AU. This LF will also be slightly impacted by the potential placement of wood in the upper river. 2015: No actions were undertaken during the 2012-2015 timeframe, therefore there was not change from baseline. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS7	Lower Lochsa (Deadman Creek to Pete King Creek)	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	70	73	73.4	100	73	100	Level of certainty = 2; Sources = 5, 7	2012: Found an additional 3 fish passage barriers in Canyon Creek in 2012. Planning to remove these barriers in future projects. Refer to comments in the "look forward actions" spreadsheet. 2015: Deep Canyon culvert was, a full barrier, which affected 5 miles of habitat, but upstream pipes limit benefit to 1 mile. Relative to total miles of all fish bearing streams in the Assessment Unit : (Streamnet =30.9 steelhead miles. Expert Panel added 1 mile (South Fork Canyon), 1 mile on Nut Creek and 2 miles on Glasser, Pillar (cutthroats only), 2 miles on Deadman mainstem, and removed 1 mile on Wally, 2 miles on Canyon, and 2.5 miles on West Fork Deadman. Net change to Streamnet number is -1.5 miles, which results in 29.4 miles as total fishbearing miles. Therefore 1 mile/29.4miles*100 = 3.4% improvement. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS7	Lower Lochsa (Deadman Creek to Pete King Creek)	4.1: Riparian Condition: Riparian Vegetation	25.00%	70	70	70.2	80	71	82	Level of certainty = 4; Sources = 3, 4, 5,6	2012: Accrued benefits from rd decommissioning projects 2015: Miles of improvement from Deep Canyon Road project (0.25) was weighted using 5-10% increase in function per year (=0.06), then made relative to total fish bearing streams in the Assessment Unit (29.4 miles). resulting in 0.2% uplift. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS7	Lower Lochsa (Deadman Creek to Pete King Creek)	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	70	70	70	80	71	82	Level of certainty = 3; Sources = 1,3, 4, 5, 7	2012: Benefits from other projects to address sediment 2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from Low Bookend. EWL 3.7.13

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Snake River Steelhead	Lochsa River	LAS7	Lower Lochsa (Deadman Creek to Pete King Creek)	7.2: Sediment Conditions: Increased Sediment Quantity	35.00%	50	50	52.5	80	62	85	Level of certainty = 2; Sources = 2, 4, 5, 6	2012: LiDAR will be utilized to determine extent and needs for this LF. In 2012 several more miles of road were found on the ground in the Bear Canyon area. 2015: For the 6 projects undertaken during the 2012-2015 timeframe, the Expert Panel weighted affected stream miles metric by landscape/slope position and possible benefit/other sediment sources remaining (much road work left to do). Relative improvement of 0.74 weighted miles over 29.4 fish bearing stream miles in the Assessment Unit is assessed at a 2.5% uplift. EWL 3.7.16.
Snake River Steelhead	Lochsa River	LAS7	Lower Lochsa (Deadman Creek to Pete King Creek)	8.1: Water Quality: Temperature	10.00%	65	65	65	75	66	77	Level of certainty = 2; Sources = 1,3, 4, 5, 6	2012: Benefits from sediment projects 2015: No project undertaken during 2012-2015 timeframe for this limiting factor, therefore there was no change from the Low Bookend. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS8	Middle Lochsa North Face tributaries - Weir to Tick Creeks	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	85	85	85	100	90	100		2012: LiDAR will be utilized to determine extent and needs for this LF. 2015: While two culvert replacements occurred during 2012-2015 timeframe, there is still one more barrier downstream. Therefore, no fish pass and there is no benefit realized from these activities. Therefore, there was no change from the Low Bookend. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS8	Middle Lochsa North Face tributaries - Weir to Tick Creeks	4.1: Riparian Condition: Riparian Vegetation	30.00%	85	85	85.2	92	87	95	Level of certainty = 2; Sources = 3, 4, 5, 6 (time needed, regeneration returning from previous fires)	2012: Bimerick Meadows road-to-trail conversion project is planned for 2015 (2 miles). Weir Creek trail construction (0.5 miles) and rehabilitation project planned for 2013. 2015: Weir Creek Trail realignment occurred as planned and the % improvement was prorated, recognizing that plants need time to grow. Thus the realized improvements by 2018 is expected to cover 0.13 river miles, over a possible 57.7 fish bearing stream miles. Thus $0.13/57.7 \times 100 = 0.2\%$ improvement. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS8	Middle Lochsa North Face tributaries - Weir to Tick Creeks	7.2: Sediment Conditions: Increased Sediment Quantity	35.00%	85	85	85.6	95	88	95	Level of certainty = 3; Sources = 3, 4, 5	2012: Bimerick Meadows road-to-trail conversion project is planned for 2015 (2 miles). LiDAR will be used to determine extent and needs for other road decommissioning projects in this AU. 2015: Indian Graves Culvert/Bridge project included road improvement actions, reducing failure and erosion risk. Stream miles affected by road improvements was weighted by landscape/slope position and total benefit possible/remaining sediment sources (0.32 miles). Relative to total fish bearing stream miles in the Assessment Unit (from Streamnet), the Expert Panel determined a 0.6% improvement. EWL 3.7.16
Snake River Steelhead	Lochsa River	LAS8	Middle Lochsa North Face tributaries - Weir to Tick Creeks	8.1: Water Quality: Temperature	30.00%	95	95	95	95	95	95	Level of certainty = 4; Sources = 3, 4	2012: Currently no projects planned for this LF. 2015: There were no actions undertaken during the 2012-2015 time frame for this limiting factor, therefore no change to low bookend. EWL 3.7.16

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Snake River Steelhead	Lochsa River	LAS9	Middle Lochsa South Face tributaries - Lottie to Robin Creeks	8.1: Water Quality: Temperature	100.00%	95	95	95	95	95	95	Level of certainty = 4; Sources = 3, 4, 6 (Doesn't meet state standards)	2012: Wilderness/roadless area- no projects planned for this AU. 2015: There were no actions undertaken during the 2012-2015 time frame for this limiting factor, therefore no change to low bookend. EWL 3.7.16
Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	4.1: Riparian Condition: Riparian Vegetation	10.00%	45	45	45	50	45	65	Level of Certainty = 3. Conservative LF weight as linked to all other impacts. HIGH BOOKENDS: Short-term (2018) response to initial riparian plantings throughout invasive weed treatment reaches and fencing/off-site watering corridors. Long-term (2033) response to maturation of riparian plantings and natural revegetation of treatment areas. LF TARGET: Riparian buffer extending >=300' from floodplain with riparian vegetation having >75% similarity to potential natural community composition. EXTANT DATA: 2003-2006 NPT canopy cover and riparian width, density and composition data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	45	45	45	50	45	65	Level of Certainty = 3. Unstable channel conditions noted throughout 2003-2006 NPT surveys; particularly throughout middle reaches of Big Canyon Creek. HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, bank stabilization, wetland development and grassed waterways. Long-term (2033) response to riparian/upland growth, forest regeneration, fencing/off-site watering and beaver recolonization. LF TARGET: Bank stability >90% for Rosgen C channel, >95% for A & B channel, 100% for E channel. Width:Depth ratio<10 for A channel, <20 for B channel, <40 for C channel and <7 for E channel. EXTANT DATA	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	6.2: Channel Structure and Form: Instream Structural Complexity	15.00%	45	45	45	50	45	65	Level of Certainty = 3. Relatively low channel/habitat complexity noted through 2003-2006 NPT datasets HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development and grassed waterways. Long-term (2033) response to riparian/upland growth, forest regeneration, fencing/off-site watering, LWD maturation/recruitment and beaver recolonization. LF TARGET: Potential natural values for pool frequency, pool quality and LWD quantity. EXTANT DATA: 2003-2006 NPT channel morphology data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	50	50	50	60	50	65	Level of Certainty = 3. Beyond effects of turbidity on juvenile and adult physiology, habitat impacts primarily localized within low gradient reaches due to high transport capacity of "flashy" systems. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, wetland development, bank stabilization and fencing/off-site watering. Long-term (2033) response to riparian/upland growth and forest regeneration. LF TARGET: Cobble Embeddedness <20%. Surface fines (<6mm) =10% for A & B channels and =20% for C & E channels. EXTANT DATA: 2003-2006 NPT pebble count, surface fines, embeddedness, variability, and	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	8.1: Water Quality: Temperature	25.00%	30	30	30	40	30	55	Level of Certainty = 2. Instantaneous max in excess of 26°C recorded at multiple locations; 28.8°C recorded at mouth of Big Canyon Creek. HIGH BOOKENDS: Short-term (2018) response to drain-tile decommissioning, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian growth and effects of hydrological stabilization actions on W:D ratios and pool habitat. LF TARGET: Water temperature <14°C. EXTANT DATA: 2003-2005 NPT thermograph data; BOR thermograph data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	8.7: Water Quality: Toxic Contaminants	2.00%	85	85	85	90	85	90	Level of Certainty = 5. Lack data, but anecdotes about Little Canyon Creek headwater sources common; supported through biological data in upper Little Canyon Creek. HIGH BOOKENDS: Short-term (2018) response to education/enforcement coordination, grassed waterways and wetland development. LF TARGET: Low levels of chemical contamination from agricultural, grazing, industrial and other sources, no excess nutrients. EXTANT DATA: 2003-2005 NPT diatom and macroinvertebrate data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	9.1: Water Quantity: Increased Water Quantity	8.00%	50	50	50	55	50	70	Level of Certainty = 4. Beyond direct impacts to redds, extremely "flashy" spring events linked to all limiting factors except 8.7. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decommissioning and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of peak flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008 NPT / NPSWCD assessment	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	Clearwater River lower mainstem	LCS1	Big Canyon Creek	9.2: Water Quantity: Decreased Water Quantity	20.00%	35	35	35	40	35	55	Level of Certainty = 2. Low baseflow levels present within all streams; intermittent reaches present on mainstem Big Canyon and Little Canyon creeks. HIGH BOOKENDS: Short-term (2018) response to drain-tile decommissioning, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to wetland maturation, riparian/upland growth, forest regeneration and beaver recolonization. LF TARGET: Discharge volume and timing of base flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2003-2006 NPT discharge data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	4.1: Riparian Condition: Riparian Vegetation	15.00%	40	40	40	50	40	65	Level of Certainty = 3 . Conservative LF weight as linked to all other impacts. HIGH BOOKENDS: Prolonged response to invasive weed treatments, maturation of riparian plantings and revegetation of fencing/off-site watering corridors. LF TARGET: Level of Certainty = 3 . Conservative LF weight as linked to all other impacts. HIGH BOOKENDS: Prolonged response to invasive weed treatments, maturation of riparian plantings and revegetation of fencing/off-site watering corridors. LF TARGET: Riparian buffer extending =300' from floodplain with riparian vegetation having >75% similarity to potential natural	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	40	40	40	50	40	60	Level of Certainty = 3. Unstable channel conditions noted through 2008-2011 NPT datasets; particularly throughout Cottonwood, Threemile and Butcher creeks. HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development, bank stabilization and grassed waterways. Long-term (2033) response to wetland maturation, riparian/upland growth, forest regeneration, fencing/off-site watering and beaver recolonization. LF TARGET: Bank stability >90% for Rosgen C channel, >95% for A & B channel, 100% for E channel. Width:Depth ratio<10 for A channel, <20 for B channel, <40 for C channel, <7 for E	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	40	40	40	50	40	60	Level of Certainty = 3. Relatively low channel/habitat complexity noted through 2008-2011 NPT datasets HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development and grassed waterways. Long-term (2033) response to riparian/upland growth, forest regeneration, fencing/off-site watering, LWD maturation/recruitment and beaver recolonization. LF TARGET: Potential natural values for pool frequency, pool quality and LWD quantity. EXTANT DATA: 2008-2011 NPT channel morphology data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	45	45	45	55	45	65	Level of Certainty = 4. Beyond impacts of turbidity on juvenile and adult physiology, habitat impacts primarily localized within low gradient reaches due to high transport capacity of "flashy" systems. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, wetland development, bank stabilization and fencing/off-site watering. Long-term (2033) response to riparian/upland growth and forest regeneration. LF TARGET: Cobble Embeddedness <20%. Surface fines (<6mm) =10% for A & B channels and =20% for C & E channels. EXTANT DATA: 2008-2011 NPT dominant substrate and pebble count data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	8.1: Water Quality: Temperature	35.00%	25	25	25	30	25	50	Level of Certainty = 2. Water temperatures appear to exceed lethal levels throughout Cottonwood Creek; may be primary limitation to Lawyer Creek productivity. HIGH BOOKENDS: Short-term (2018) response to drain-tile decom, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian growth and hydrological stabilization actions effect on W:D ratios and pool habitat. LF TARGET: Water temperature <14°C. EXTANT DATA: 2008-2011 NPT instantaneous and Water Resources thermograph data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	9.1: Water Quantity: Increased Water Quantity	5.00%	40	40	40	45	40	60	Level of Certainty = 5. Beyond direct impacts to redds, extremely "flashy" spring events linked to all limiting factors; evidence of extremely disruptive flows within Cottonwood, Threemile and Butcher creeks. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decommissioning and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of peak flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT BF to wetted width data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS2	Camas Prairie tributaries	9.2: Water Quantity: Decreased Water Quantity	15.00%	30	30	30	35	30	50	Level of Certainty = 3. Low baseflow levels present throughout all watersheds; significant portions of mainstem Threemile and Butcher creeks intermittent. HIGH BOOKENDS: Short-term (2018) response to drain-tile decommissioning, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian/upland growth, wetland maturation, forest regen and beaver recolonization. LF TARGET: Discharge volume and timing of base flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT wetted width and depth data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	65	65	65	95	65	95	Level of Certainty = 4. Previous value overinflated for original AU. Data for new AU restricted to Tom Taha, Maggie, Sally Ann and Sill Creek; info for remainder of AU received from regional staff. HIGH BOOKENDS: Immediate response to replacement of fish passage barriers; <100% HB as potential for barrier(s) to be located upon uncooperative landowner parcel(s). LF TARGET: Full upstream and downstream passage for adult and juvenile fish at all flows. EXTANT DATA: 2008-2011 NPT groundtruthing observations	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	4.1: Riparian Condition: Riparian Vegetation	10.00%	50	50	50	55	50	70	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Prolonged response to maturation of riparian plantings and natural revegetation of fencing/off-site watering corridors and weed treatment reaches. LF TARGET: Riparian buffer extending =300' from floodplain with riparian vegetation having >75% similarity to potential natural community composition. EXTANT DATA: 2008-2011 NPT photos and canopy cover data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	6.1: Channel Structure and Form: Bed and Channel Form	15.00%	45	45	45	55	45	70	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Short-term (2018) response to levee removal, bank stabilization and wetland development. Long-term (2033) response to riparian/upland growth, forest regeneration and fencing/off-site watering. LF TARGET: Bank stability >90% for Rosgen C channel, >95% for A & B channel, 100% for E channel. Width:Depth ratio<10 for A channel, <20 for B channel, <40 for C channel and <7 for E channel. EXTANT DATA: 2008-2011 NPT undercut bank and wetted width/depth data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	50	50	50	60	50	75	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Short-term (2018) response to levee removal and wetland development. Long-term (2033) response to riparian/upland growth, forest regeneration, LWD maturation/recruitment and fencing/off-site watering. LF TARGET: Potential natural values for pool frequency, pool quality and LWD quantity. EXTANT DATA: 2008-2011 NPT channel morphology data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	40	40	40	45	40	60	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Short-term (2018) response to wetland development, bank stabilization and fencing/off-site watering. Long-term (2033) response to riparian/upland growth, road decommissioning and forest regeneration. LF TARGET: Cobble Embeddedness <20%. Surface fines (<6mm) =10% for A & B channels and =20% for C & E channels. EXTANT DATA: 2008-2011 NPT dominant substrate and pebble count data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	8.1: Water Quality: Temperature	15.00%	40	40	40	45	40	60	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Short-term (2018) response to wetland development and education / enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian/upland growth and effects of levee removal/hydrological stabilization action on W:D ratios and pool habitat. LF TARGET: Water temperature <14°C. EXTANT DATA: 2008-2011 NPT instantaneous data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	9.1: Water Quantity: Increased Water Quantity	10.00%	50	50	50	55	50	65	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of peak flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT BF to wetted width data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS3	Clearwater Mountain tributaries	9.2: Water Quantity: Decreased Water Quantity	15.00%	40	40	40	45	40	55	Level of Certainty = 5. Data for revised AU restricted to Maggie and Sally Ann Creek; details for remainder of AU received from regional staff. HIGH BOOKENDS: Short-term (2018) response to wetland development and education / enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian/upland growth, wetland maturation and forest regeneration. LF TARGET: Discharge volume and timing of base flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT wetted width and depth data	2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	60	60	60	95	60	95	Level of Certainty = 1. Passage currently blocked to 25% of productive channel as well as critical cool water refugia. HIGH BOOKENDS: Immediate response to replacement of fish passage barriers; <100% HB as potential for barrier(s) to be located upon uncooperative landowner parcel(s). LF TARGET: Full upstream and downstream passage for adult and juvenile fish at all flows. EXTANT DATA: NPT Passage Barrier Assessment	2012: ESTIMATED IMPROVEMENT BASED ON LYNNE R. PROJECTS THAT AREN'T YET LOADED INTO SYSTEM; 8 PROJECTS & ABT. 15 MILES IMPROVED ACCESSED (Jack Spur, Mission Cr, push up berm, Sweetwater, Web Cr, Tom Bell, 8 of 232 barriers). NPT - no projects planned but will continue working on the Lewiston Orchards Irrigation District water diversions that are the largest barriers in the Lapwai Creek drainage. 2015: Two culvert projects opened habitat, but there are barriers below, including a full barrier. Therefore, no benefits from these activities were reported. Therefore there was no change from the low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	4.1: Riparian Condition: Riparian Vegetation	15.00%	35	35	36.4	55	45	65	Level of Certainty = 3. Conservative LF weight as linked to all other impacts. HIGH BOOKENDS: Short-term (2018) response to initial riparian plantings throughout invasive weed treatment reaches, fencing/off-site watering corridors and removal of RR prism, levees and I95 pullouts. Long-term (2033) response to maturation of riparian plantings and natural revegetation of treatment areas. LF TARGET: Riparian buffer extending =300' from floodplain with riparian vegetation having >75% similarity to potential natural community composition. EXTANT DATA: 2003-2006 NPT canopy cover and riparian width, density and compositon data. These efforts will also	Estimate based on NPT proejcts only - 3.25 miles total of riparian tree/shrub restoration. Lynne R. projects to be considered in "look back" at 2015 EP Workshop - Plant Vegetation - 36 riparian & 10 wetland acres (in top 3 priority areas in Restoration Plan); riparian fencing, livestock water developments Restoration Plan says 2800 riparian acres need enhancement 2015: No fewer10 riparian fencing, planting, and weed control projects, treated more than 31 stream miles. The Expert Panel adjusted those treated miles for the purposes of assigning benefit to 2018 by prorating based on percent improvement anticipated by estimating annual growth to 2018 (ranges from 1% t0 30%). Value of weed control (primarily spotted knotweed) was accounted for in weighting. Post-weighting, the Expert Panel estimated that 1.0781 stream miles were improved. Taken over the 75.5 stream miles where steelhead are distributed in the Assessment Unit (based on SStreamnet data), the average is 1.40%

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Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	6.1: Channel Structure and Form: Bed and Channel Form	5.00%	50	50	51.1	75	55	75	Level of Certainty = 2. Anthropogenic channel confinement particularly limiting in Lapwai and lower Mission creeks. HIGH BOOKENDS: Short-term (2018) response to removal of RR prism, levees and I95 pullouts. LF TARGET: Bank stability >90% for Rosgen C channel, >95% for A & B channel, 100% for E channel. Width:Depth ratio<10 for A channel, <20 for B channel, <40 for C channel and <7 for E channel. EXTANT DATA: 2003-2006 NPT reports, 2008 NPT assessment. These efforts will also affect LF 4.1, 6.2, 7.2, and 8.1.	2012: ESTIMATE BASED ON NPT PROJECTS - 4 major levee systems to be set-back or removed. 2015: Two projects were accomplished during 2012-2015. They were quite different so the Expert Panel assessed them separately. Sweetwater Creek Levee project treated 0.1 mile, which was adjusted by 75% recognizing that it may take longer than to 2018 to fully achieve goals. It's relative improvement over the Assessment Unit was made relative to the extent and state of treatable channel in reaches in Assessment Unit (=21 river miles up to confluence), thus, the improvement from this project= 0.4% (0.075/21*100). The Rock Creek project (0.7 miles treated) was also prorated 75% but because it is upstream of fish use and had a more restricted extent, improvement was made relative to 75.5- stream miles. Therefore, the improvement from Rock Creek Restoration is 0.7% (0.525/75.5*100). The resulting sum of the two actions is 1.1% improvement over the low booked. EWL 3.10.16.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	40	40	40.3	50	45	60	Level of Certainty = 3. Relatively low channel/habitat complexity noted through 2003-2006 NPT datasets HIGH BOOKENDS: Short-term (2018) response to floodplain connectivity, no-till, drain tile decommissioning, wetland development and grassed waterways. Long-term (2033) response to riparian/upland growth, forest regeneration, fencing/off-site watering, LWD maturation/recruitment and beaver recolonization. LF TARGET: Potential natural values for pool frequency, pool quality and LWD quantity. EXTANT DATA: 2003-2006 NPT channel morphology data	2012:ESTIMATE BASED ON IDENTIFIED NPT PROJECTS. 0.66 miles of stream channel restroation on NPT trust unit 40 (headwaters of Rock Creek); additional benefits from 4 major levee systems to be addressed. 2015: Three projects that indirectly affected channel structure and form were considered. For example, the Tom Beal Bridge bank stabilization project used rock that affected instream structure for 0.01 river miles (created pool where coho has been seen), The Expert Panel adjusted the functional river miles of improvement by weighting based on anticipated improvement to 2018. Each project was assessed relative to the potential length of all treatable channels in the Assessment Unit. Therefore for the 0.81 miles treated in the Assessment Unit, only 0.17 stream miles will have affective improvements by 2018. Considered over the 50.5 miles in the Assessment Unit (the Expert Panel subtracted 25 miles from the Streamnet database because it is a canyon and channel structure and form cannot be changed there)

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Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	40	42	42.1	50	43	70	Level of Certainty = 3. Beyond effects of turbidity on juvenile and adult physiology, habitat impacts primarily localized within low gradient reaches due to high transport capacity of "flashy" systems. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, wetland development, bank stabilization and fencing/off-site watering. Long-term (2033) response to riparian/upland growth, forest regeneration and road decommissioning. LF TARGET: Cobble Embeddedness <20%. Surface fines (<6mm) <=10% for A & B channels and <=20% for C & E channels. EXTANT DATA: 2003-2006 NPT pebble count, surface fines, embeddedness	2012: Estimate based on NPT projects only - Small additional benefits from riparian restoration work.. Lynne R. projects not yet loaded into Taurus system & should be included in look back estimates at 2015 EP workshop (WE 48 Tillage - 5000 acres, WE 47 - Plant Veg 800 acres, Rd Improvements - 18 miles (30% riparian/70% upland); Upland Sediment Control Measures - grass waterways 3000 ft (immediate benefits), 25 gully erosion treatments, 1100' streambank stabilization) 2015:The Expert Panel considered the riparian vegetation actions (limiting factor 4.1) as also improving for sediment. One additional project was added that was undertaken specifically due to an erosion problem (Fountain Grade). The Expert Panel considered length of downstream stream that benefited actions, and for no till projects considered proximity to creek, but did not count knotweed/biocontrol projects. Projects were weighted according to watershed/slope position and total benefit possible , given other known sediment problems in the miles

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Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	8.1: Water Quality: Temperature	25.00%	30	30	30.4	45	38	55	Level of Certainty = 1. Instantaneous max in excess of 26°C recorded at multiple locations; 31.8°C recorded at mouth of Lapwai Creek. HIGH BOOKENDS: Short-term (2018) response to drain-tile decommissioning, wetland development, education/enforcement coordination on illegal withdrawals and decommissioning of LOID diversions. Long-term (2033) response to riparian growth and effects of hydrological stabilization actions on W:D ratios and pool habitat. LF TARGET: Water temperature <14°C. EXTANT DATA: 2003-2005 NPT thermograph data; BOR thermograph data	2012: NPT PROJECTS CONSIDERED ONLY. Benefits from 3.25 miles of riparian restoration, in addition to benefits from influence on hyporheic flow from NPT trust unit 40 stream restoration and 4 major levee systems to be addressed. 2015: Weed treatment improves temperature because native plant survival and growth improves, and native plants have a greater shading potential. However, the weed treatment projects that occurred within this Assessment Unit were removed from consideration here to avoid "double counting" with other vegetation actions in same sites. The Expert Panel adjusted stream miles treated by assessing a 1% weighting factor to each project to account for progress toward shading through 2018. Thus the 32.17 stream miles treated, resulted in a realized change of only 0.32 stream miles (after weighting). Therefore, considered across the entire Assessment Unit the projects resulted in a 0.4% improvement for this limiting factor

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Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	8.7: Water Quality: Toxic Contaminants	2.00%	80	80	80	85	80	90	Level of Certainty = 5. Lack data, but adjacent to I95 and Culdesac trap range and anecdotal information re. residential impacts common. HIGH BOOKENDS: Short-term (2018) response to education/enforcement coordination, grassed waterways and wetland development . Long-term (2033) response to maturation of riparian plantings adjacent I95. LF TARGET: Low levels of chemical contamination from agricultural, grazing, industrial and other sources, no excess nutrients. EXTANT DATA: NPT water quality analysis of Culdesac trap range.	2012: No projects planned 2015: No projects were undertaken during 2012-2015 that address this limiting factor, therefore there was no change from the Low Bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	9.1: Water Quantity: Increased Water Quantity	8.00%	45	45	45	50	47	60	Level of Certainty = 4. Beyond direct impacts to redds, extremely "flashy" spring events linked to all limiting factors except 1.1 and 8.7. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decommissioning and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of peak flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: USGS gauge data	2012: NPT PROJECTS CONSIDERED ONLY. Benefits from 3.25 miles of riparian restoration, in addition to benefits from floodplain restoration on NPT trust unit 40 stream restoration and 4 major levee systems to be addressed. 2015: No actions were undertaken during 2012-2015 time period, therefore, there was no change to the low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS4	Lapwai Creek Basin	9.2: Water Quantity: Decreased Water Quantity	15.00%	35	35	35	55	38	65	Level of Certainty = 2. Low baseflow levels present within all streams; Webb, Sweetwater and lower Lapwai Creek discharge impacted by BOR water withdrawals. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decommissioning, wetland development and decommissioning of LOID diversions. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of base flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: USGS gauge data and 2003-2006 NPT discharge data	2012: NPT PROJECTS CONSIDERED ONLY. Benefits from 3.25 miles of riparian restoration, in addition to benefits from floodplain restoration on NPT trust unit 40 stream restoration and 4 major levee systems to be addressed. 2015: No actions were undertaken during 2012-2015 period to address this limiting factor, therefore there is no change to the low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	65	65	71	75	75	75	Migration barriers are planned for removal on the W. Fork Little Bear. Culvert replacements are scheduled throughout the Potlatch River system that currently serve as migration barriers. Add Comment Per D. Keen 2/21/2013 "An additional barrier on Big Bear Creek is scheduled for evaluation and for passage improvement."	2012: 71 miles total improved access Value Edited to "86 miles total improved access" Per D. Keen 2/21/2013 2015: Troy Dam (including 2 culverts) removal provided 10.7 miles of access (there are 35 stream miles upstream of dam, but not all are usable, in part due to upstream culverts). Because this was a total barrier removal project, the Expert Panel assessed this a 100% improvement over the stream miles now accessible. To consider the improvement of this project relative to all steelhead bearing stream miles in the Assessment Unit, the Expert Panel started with the Streamnet data layer, but then added miles for tributaries, based on known steelhead use, natural barriers, and gradient: 5 miles on Little Potlatch Creek, 21 miles on Little Bear, 10 miles on Big Bear (partial barriers exist; O. mykiss found up to highway); Middle Fork, Pine Creek was accurate in Streamnet; 5 miles was added on Cedar and 0.0 miles on Rock Creek, removed 2 miles from Boulder Creek (natural barrier), and added 1 mile on

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Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	4.1: Riparian Condition: Riparian Vegetation	15.00%	50	50	50.7	55	65	65	A large portion of the diminished riparian corridors are located within the basin where agriculture has been active and continues to be active as well as areas of active livestock grazing. The riparian conditions in these areas will be enhanced through livestock exclusion, riparian plantings with native species, and the implementation of upland agricultural practices that reduce sheet and gully erosion. These efforts will also affect 6.1, 6.2, 7.2, and 8.1.	2012: ADD LSWCD Projects - 8 projects, benefits from projects in other LF. 2015: Seven projects totaling 4.36 river miles of treated area were considered and the stream miles treated was prorated based on growth to 2018. The meadow projects are meant to help hydrology (shift hydrograph to provide more baseflow) rather than riparian vegetation, so they were weighted accordingly. Projects that dominated by sedges mature quickly. Tree projects mature slower. Thus, after adjustments, the projects improved 1.341 stream miles. Considered over the 179.5 stream miles in the Assessment Unit (from Streamnet plus miles added through Expert Panel review of tributaries using local knowledge), the improvement was 0.7% (1.341/179.5*100). There was recognition that this is a large drainage, so the projects were not anticipated to make major changes for this limiting factor. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	45	45	47.1	55	60	60	Channel structure and stability will be enhanced in the agriculture and forest landscapes through meadow and instream channel restorations where channel sinuosity has been lost and riparian restoration plantings. Areas of focus through 2018 will include Big Bear Creek, Little Bear Creek, Corral Creek, Fry Creek, and E. Fork Potlatch River.	2012: 6.25 stream miles total - most are meadow restoration projects. 2015: Associated with larger meadow restoration projects. Found redds and juvenile rearing in Fry Meadow right away. Bloom Creek saw fast gravel and sediment response to channel reconstruction. 4.21 stream miles treated. With recognition that these types of project require time to realize their full affects, the Expert Panel adjusted river miles treated based on expected functionality in 2018. Thus, stream miles treated was adjusted to 3.745 miles. Considered relative to steelhead bearing river miles the entire Assessment Unit f(179.5 miles; Streamnet data plus adjustment from the Expert Panel using local knowledge of fish distribution in tributaries). Therefore, there is a 2.1% improvement over the low bookend for this limiting factor (3.745/179.5*100). EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	40	40	41.7	45	55	55	Instream structural complexity will be enhanced through instream channel restorations (e.g., large woody debris when appropriate) and riparian plantings with native species will take place to add instream structural complexity	<p>2012: Big Bear Creek - 2 miles, riparian meadow restoration; IDFG - 2 projects, Bloom Cr, restoration - channel realignment, E Fork LWD project; Comment Edited Per D. Keen 2/21/2013 "Big Bear Creek - 2 miles, riparian meadow restoration; IDFG - 3 projects, Bloom Cr, restoration - channel realignment, 2-E Fork LWD projects;"</p> <p>2015:Panel reviewed table from limiting factor 6.1 regarding work elements and for applicability to limiting factor 6.2; they considered installed complexity as well as channel changes since construction and to 2018. Racetrack and Upper Corral incorporated historical channel, thus received a high weight. Wood was added to Fry and Bloom. The 4.21 stream miles treated were adjusted to consider functional improvement through 2018 to 3.007 miles. Considered over all steelhead bearing river miles in the Assessment Unit (from SStreamnet plus adjusted by Expert Panel using local knowledge of fish distribution in tributaries. 470.5</p>

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Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	40	40	41	50	55	55	Upland forest and agriculture practices will be installed to minimize the delivery of fine sediments to critical streams. Emphasis will be placed on road rocking projects near fish bearing streams, replacing undersized culverts, and implementing agricultural practices designed to minimize sheet, rill and gully erosion.	2012: 10 LSWCD Projects + projects from other LF (i.e. Riparian) 2015: With recognition that riparian vegetation projects also improve bank stabilization and reduces sedimentation, the Expert Panel considered the sediment flux after several projects across 4.21 river miles. They considered the magnitude of effect, realizing that it depends on subwatershed and location, and the action e.g., channels had been incised, and were sediment sources, now, this should be reduced due to projects). But there are other anthropogenic sediment sources in the same reaches, so each project was weighted accordingly (position on landscape, total benefit possible within reach, subwatershed importance). After all multipliers were applied, the projects impacted 1.73 stream miles. Considered over this large Assessment Unit (179.5 steelhead bearing river miles), the projects improved this limiting factor by 1.0 % (1.73/179.5*100). EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	8.1: Water Quality: Temperature	20.00%	30	30	30	35	45	45	Practices will place an emphasis on restoring degraded riparian areas to minimize direct summer solar inputs to local streams. Meadow restorations will take place to provide for a source of cool groundwater inputs to streams. These efforts will also affect 4.1, 6.1, and 6.2.	2012: 2 LSWCD Projects - riparian fencing, 3.5 river miles 2015: Expert Panel considered affects of Meadow projects and hyporheic changes to temperature. There are local benefits, but not measurable in assessment period at the assessment unit scale. Temperature is related to flow, but in this case, benefits are local, and affect winter temperatures (moderating overwintering habitat conditions) which is not included in this limiting factor. Therefore, the was no change from the low bookend. EWL 3.10.16
Snake River Steelhead	Clearwater River lower mainstem	LCS5	Potlatch River Basin	9.2: Water Quantity: Decreased Water Quantity	20.00%	30	30	30	35	40	40	Meadows and wetland restorations will take place to provide for a source of base flows throughout the summer and fall. These efforts will also affect 6.2 and 8.1.	2012: 1 LSWCD project - flow augmentation from City of Troy reservoir; 1 IDFG reforestation project 2500 primarily upland acres.Comment Edited Per D. Keen 2/21/2013 "1 LSWCD project - flow augmentation from City of Troy reservoir; 1 IDFG reforestation project 2500 primarily upland acres, 2 IDFG Flow augmentation projects-Spring Valley Reservoir and alternative site for reservoir construction." 2015: There were some relevant actions taken to address this limiting factor, but there will be no measureable improvement realized by 2018. Therefore, there was no change to the low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	4.1: Riparian Condition: Riparian Vegetation	15.00%	55	55	55	60	55	75	Level of Certainty = 3. Conservative LF weight as linked to all other impacts. HIGH BOOKENDS: Short-term (2018) response to initial riparian plantings throughout invasive weed treatment reaches and fencing/off-site watering corridors. Long-term (2033) response to maturation of riparian plantings, natural revegetation of treatment areas and forest regeneration. LF TARGET: Riparian buffer extending =300' from floodplain with riparian vegetation having >75% similarity to potential natural community composition. EXTANT DATA: 2008-2011 NPT photos and canopy cover data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	6.1: Channel Structure and Form: Bed and Channel Form	5.00%	45	45	45	50	45	60	Level of Certainty = 4. Unstable channel conditions noted through 2008-2011 NPT datasets HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development, bank stabilization and grassed waterways. Long-term (2033) response to wetland maturation, riparian/upland growth, forest regeneration, fencing/off-site watering and beaver recolonization. LF TARGET: Bank stability >90% for Rosgen C channel, >95% for A & B channel, 100% for E channel. Width:Depth ratio<10 for A channel, <20 for B channel, <40 for C channel and <7 for E channel. EXTANT DATA: 2008-2011 NPT undercut bank documented	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	50	50	50	55	50	65	Level of Certainty = 4. Relatively low channel/habitat complexity noted through 2008-2011 NPT datasets HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development and grassed waterways. Long-term (2033) response to wetland maturation, riparian/upland growth, forest regeneration, fencing/off-site watering, LWD maturation/recruitment and beaver recolonization. LF TARGET: Potential natural values for pool frequency, pool quality and LWD quantity. EXTANT DATA: 2008-2011 NPT channel morphology data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	40	40	40	45	40	55	Level of Certainty = 4. Beyond impacts of turbidity on juvenile and adult physiology, habitat impacts primarily localized within low gradient reaches due to high transport capacity of "flashy" systems. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, wetland development, bank stabilization and fencing/off-site watering. Long-term (2033) response to riparian/upland growth, road decommissioning and forest regeneration. LF TARGET: Cobble Embeddedness <20%. Surface fines (<6mm) =10% for A & B channels and =20% for C & E channels. EXTANT DATA: 2008-2011 NPT dominant substrate and pebble	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	8.1: Water Quality: Temperature	25.00%	35	35	35	40	35	50	Level of Certainty = 3. Max temps appear particularly limiting to Jim Ford and mid-lower Orofino Creek HIGH BOOKENDS: Short-term (2018) response to drain-tile decom, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian growth and effects of hydrological stabilization actions on W:D ratios and pool habitat. LF TARGET: Water temperature <14°C. EXTANT DATA: 2008-2011 NPT instantaneous and Water Resources thermograph data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	9.1: Water Quantity: Increased Water Quantity	5.00%	45	45	45	50	45	55	Level of Certainty = 5. Beyond direct impacts to redds, extremely "flashy" spring events linked to all limiting factors. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decom and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of peak flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT BF to wetted width data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6A	Weippe Prairie	9.2: Water Quantity: Decreased Water Quantity	25.00%	30	30	30	35	30	50	Level of Certainty = 3. Low rheic flows appear particularly limiting to Whiskey and Big Creek HIGH BOOKENDS: Short-term (2018) response to drain-tile decommissioning, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian/upland growth, wetland maturation, forest regeneration and beaver recolonization. LF TARGET: Discharge volume and timing of base flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT wetted width and depth data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	1.1: Habitat Quantity: Anthropogenic Barriers	2.00%	75	75	75	95	75	95	Level of Certainty = 3. Barrier at mouth of Lindsay Creek responsible for majority of habitat loss. HIGH BOOKENDS: Immediate response to replacement of fish passage barriers; <100% HB as potential for barrier(s) to be located upon uncooperative landowner parcel(s). LF TARGET: Full upstream and downstream passage for adult and juvenile fish at all flows. EXTANT DATA: 2008-2011 NPT groundtruthing observations	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	4.1: Riparian Condition: Riparian Vegetation	10.00%	45	45	45	50	45	60	Level of Certainty = 3. Conservative LF weight as linked to all other impacts. HIGH BOOKENDS: Short-term (2018) response to initial riparian plantings throughout invasive weed treatment reaches, fencing/off-site watering corridors and removal or setback of levees. Long-term (2033) response to maturation of riparian plantings and natural revegetation of treatment areas. LF TARGET: Riparian buffer extending =300' from floodplain with riparian vegetation having >75% similarity to potential natural community composition. EXTANT DATA: 2008-2011 NPT photos and canopy cover data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	45	45	45	50	45	65	Level of Certainty = 4. Unstable channel conditions noted through 2008-2011 NPT datasets HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development, bank stabilization and grassed waterways. Long-term (2033) response to wetland maturation, riparian/upland growth, forest regeneration, fencing/off-site watering and beaver recolonization. LF TARGET: Bank stability >90% for Rosgen C channel, >95% for A & B channel, 100% for E channel. Width:Depth ratio<10 for A channel, <20 for B channel, <40 for C channel and <7 for E channel. EXTANT DATA: 2008-2011 NPT undercut bank documented	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	6.2: Channel Structure and Form: Instream Structural Complexity	15.00%	50	50	50	55	50	70	Level of Certainty = 4. Relatively low channel/habitat complexity noted through 2008-2011 NPT datasets HIGH BOOKENDS: Short-term (2018) response to no-till, drain tile decommissioning, wetland development and grassed waterways. Long-term (2033) response to wetland maturation, riparian/upland growth, fencing/off-site watering, forest regeneration, LWD maturation / recruitment and beaver recolonization. LF TARGET: Potential natural values for pool frequency, pool quality and LWD quantity. EXTANT DATA: 2008-2011 NPT channel morphology data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	45	45	45	55	45	70	Level of Certainty = 4. Beyond impacts of turbidity on juvenile and adult physiology, habitat impacts primarily localized within low gradient reaches due to high transport capacity of "flashy" systems. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, wetland development, bank stabilization and fencing/off-site watering. Long-term (2033) response to riparian/upland growth and road decommissioning. LF TARGET: Cobble Embeddedness <20%. Surface fines (<6mm) =10% for A & B channels and =20% for C & E channels. EXTANT DATA: 2008-2011 NPT dominant substrate and pebble	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	8.1: Water Quality: Temperature	20.00%	35	35	35	40	35	50	Level of Certainty = 3. Max temps appear particularly limiting to lower Cottonwood Creek. HIGH BOOKENDS: Short-term (2018) response to drain-tile decommissioning, wetland development and education/enforcement coordination on illegal withdrawals. Long-term (2033) response to riparian growth and effects of hydrological stabilization actions on W:D ratios and pool habitat. LF TARGET: Water temperature <14°C. EXTANT DATA: 2008-2011 NPT instantaneous and Water Resources thermograph data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	9.1: Water Quantity: Increased Water Quantity	8.00%	45	45	45	50	45	60	Level of Certainty = 5. Beyond direct impacts to redds, extremely "flashy" spring events linked to all limiting factors. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decommissioning and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of peak flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT BF to wetted width data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Clearwater River lower mainstem	LCS6B	Lower canyon tributaries	9.2: Water Quantity: Decreased Water Quantity	25.00%	30	30	30	35	30	45	Level of Certainty = 3. Low baseflow levels present within all streams, intermittent reaches present throughout majority of streams. HIGH BOOKENDS: Short-term (2018) response to no-till, grassed waterways, drain tile decommissioning and wetland development. Long-term (2033) response to wetland maturation, riparian/upland growth and forest regeneration. LF TARGET: Discharge volume and timing of base flows comparable to a watershed functioning within its natural disturbance regime. EXTANT DATA: 2008-2011 NPT wetted width and depth data	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS1	Eldorado Creek	1.2: Habitat Quantity: Natural Barriers	0.00%	5	5	5	5	5	5	Eldorado Falls (natural barrier) blocks 95% of the habitat in this drainage.	2012: Natural barrier LF weight set to 0%. Current distribution mimics historic accessibility. 2015: 2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

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Snake River Steelhead	Lolo Creek	LOS1	Eldorado Creek	4.1: Riparian Condition: Riparian Vegetation	50.00%	70	70	70	75	70	80	NPT Lolo Creek monitoring report (2011) reports heavily impacted by history of logging, infrastructure development (roads, powerlines, etc), and/or grazing	2012: No actions planned 2015: 2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS1	Eldorado Creek	7.2: Sediment Conditions: Increased Sediment Quantity	50.00%	60	60	60	70	70	75	Upper Lolo EAWS (2003): sediment estimated at 6 tons/sq miles/year and currently elevated by an estimated 33 percent over natural.	2012: 20 miles of road decommissioning through Lolo insect and disease. 2015: 2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lolo Creek	LOS2	Jim Brown Creek	1.1: Habitat Quantity: Anthropogenic Barriers	15.00%	70	72	80.7	85	72	85	NPT Culvert Assessment (2010) identified 13 culverts in this watershed which are identified as fish passage barriers.	2012: Jim Brown MP 39 scheduled for 2013 will return 5 miles of stream habitat; Competed 4 barrier removals in the watershed to date. 2015: Jim Brown 2012 culvert replacement opened up 5 miles of habitat, but there are 26 known remaining culverts, 18 surveyed; 17 miles are still blocked. Two other culverts were replaced on this road. Only one left on mainstem, near top. A new culvert was installed without passage. The Expert Panel adjusted the miles of treatment accounting for life history stage use of upstream habitat (75%) -- there is some spawning, but mostly used for rearing = 3.75 stream miles. Benefits considered across the Assessment Unit required an estimate of total steelhead bearing stream miles in the Assessment Unit. Streamnet had no steelhead use miles mapped, so the Expert Panel approximated using the 35.1 miles of 2nd and 3rd order streams. Steelhead are seen stacking up in pool below Jim Brown. Habitat is limited, but has some use. O. mykiss is present and spawning.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lolo Creek	LOS2	Jim Brown Creek	4.1: Riparian Condition: Riparian Vegetation	15.00%	40	40	40.1	50	43	65	NPT Lolo Creek monitoring report (2011) reports heavily impacted by history of logging, infrastructure development (roads, powerlines, etc), and/or grazing	2012: 1 mile of riparian planting planned 2015: Vegetation planting associated with a culvert replacement project resulted in 0.075 stream miles treated, adjusted for growth through 2018, the stream miles improved were 0.023. Across the 35.1 steelhead bearing stream miles in the Assessment Unit (based on summation of 2nd and 3rd order streams), the improvement for this limiting factor = 0.1% (0.023/35.1*100). EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS2	Jim Brown Creek	7.2: Sediment Conditions: Increased Sediment Quantity	25.00%	40	41	41.3	45	43	50	Upper Lolo EAWS (2003), Jim Brown Coordinated Resource Mangement Plan (1997): Impacts from roads and road construction have had the greatest effect on erosional processes in this watershed,	2012: Secondary benefits from 1 mile of riparian planting to be completed 2015: The Expert Panel assessed the Jim Brown project, which replaced an undersized pipe that was at risk of failure, and was overtopping the road. It is a low gradient area, so affected downstream 1 mile, but the Expert Panel adjusted the affected river miles with weighting based on landscape position and total benefit possible there (lots of additive cattle impacts) to 0.45 stream miles affected. Therefore, across the 35.1 steelhead bearing stream miles in the Assessment Unit (estimated from 2 and 3rd order tributaries) , there was a 1.3% (0.45/35.1*100) improvement from the low bookend. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lolo Creek	LOS2	Jim Brown Creek	8.1: Water Quality: Temperature	30.00%	40	40	40.1	45	45	50	NPT Lolo Creek monitoring report (2011) reports warm temperature due to loss of riparian cover due to grazing, elevation, geology, and influence of tributary streams	2012: Based on the data, both of the average water temperature exceedences, the 16°C daily average and the instantaneous maximum of 20°C, for the Lolo Creek watershed have decreased significantly since measurements began; 1 mile of riparian planting to be completed. 2015:A project that rerouted of water and planted vegetation (which cools the stream as it grows up) was considered. The stream was re-meandered out of a road ditch and back into the stream channel (which was by the way in a shady location). It also increased channel length, reduced slope, and there is more groundwater interaction now. The 0.075 stream miles treated was adjusted for realized improvement by 2018 (=0.0225) and considered over the entire steelhead bearing stream miles in the Assessment Unit (35.1 miles; a summation of 2nd and 3rd order streams as per the Expert Panel). Therefore, $0.0225/35.1 \times 100 = 0.1\%$ improvement to this limiting factor. EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS2	Jim Brown Creek	8.2: Water Quality: Oxygen	15.00%	40	40	40	65	43	70	Upper Lolo EAWS (2003): pollutants of concern include: bacteria, dissolved oxygen, flow and habitat alterations, nutrients, oil and grease, sediment and temperature	2012: Benefits from 1 mile of riparian planting to be completed 2015: No actions undertaken during 2012-2015 that address this limiting factor, therefore no change to low bookend. EWL 2.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lolo Creek	LOS3	Lolo Creek	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	85	86	86.1	90	86	90	NPT Culvert Assessment (2010) identified 19 culverts in this watershed which are identified as fish passage barriers.	2012: Molly Creek to return 3 miles of stream habitat 2015: The Collette Mine project removed 0.19 miles of berm and regraded to reconnect 4.2 acres of floodplain, added 10 wood structures, and accomplished 1,000 ft of bank work for a total of 1.2 treated miles. Recognizing that these improvements take time to be fully realized, the Expert Panel adjusted affected stream miles for the Collette Mine project (=0.6). Relative to steelhead bearing stream miles in the Assessment Unit (Streamnet steelhead miles, plus the less steep 2 miles of Crocker Creek, 1 mile of Molly Creek, lower 1 mile of Mud Creek;= 54.5 miles), this project resulting in a 1.1% improvement for this limiting factor. EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS3	Lolo Creek	4.1: Riparian Condition: Riparian Vegetation	40.00%	60	60	60.1	75	75	80	NPT Lolo Creek monitoring report (2011) reports heavily impacted by history of logging, infrastructure development (roads, powerlines, etc), and/or grazing	2012: Colette Mine Stream Restoration will restore approximately 5 miles of stream habitat, recontour, and reconnect the flood plain and wetlands 2015: Riparian vegetation planting over 0.2 miles was associated with the Collette Mine Restoration project (phase 1). The Expert Panel adjusted the treated stream miles to reflect the time it takes for vegetation to grow, therefore the realized change in 2018 is expected to affect 0.06 stream miles. Relative to all steelhead bearing stream miles in the Assessment Unit (54.5 miles based on Streamnet plus the less steep 2 miles of Crocker Creek, 1 mile of Molly Creek, lower 1 mile of Mud Creek), the project resulted in 0.1% improvement. EWL 3.10.16.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lolo Creek	LOS3	Lolo Creek	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	70	70	70.5	75	75	80	Upper Lolo EAWS (2003): roads and trails that cross streams or are adjacent to streams have the highest potential to deliver sediment to streams. Road densities in the lower part of Lolo equals 4.7 mi/sq mi. and has the highest number of crossings (74).	2012: Collette Mine Stream Restoration will restore approximately 5 miles of stream habitat, recontour, and reconnect the flood plain and wetlands: 2012: Colette Mine Stream Restoration removed 0.19 miles of berm and regraded to reconnect 4.2 acres of floodplain, added 10 wood structures, and accomplished 1,000 ft of bank work to restore stream habitat, recontour, and reconnect the flood plain and wetlands. The project brought wood load up to 100%, but channel is still adapting to wood, so by 2018 is anticipated at 80% function. Therefore, the 0.2 miles treated was adjusted to 0.16 stream miles. Relative to the 29.5 steelhead bearing stream miles in the Assessment Unit (54.5 Streamnet miles minus lower 18 miles of canyon reach and 7 miles of unmanaged upper sections with good wood loading), this project resulted in 0.5% improvement. EWL 3.10.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	Lolo Creek	LOS3	Lolo Creek	7.2: Sediment Conditions: Increased Sediment Quantity	40.00%	70	70	71.7	80	79	85	Upper Lolo EAWS (2003): sediment estimated at 6 tons/sq miles/year and currently elevated by an estimated 33 percent over natural.	2012: 35 miles of road decommissioning through Lolo insect and disease EIS 2015: Treated miles from Collette Mine restoration was assessed to extend 2 miles downstream till gradient change, and Molly Creek culvert replacement addressed sedimentation 1 mile downstream. Project effectiveness (in miles) was adjusted by landscape position and other sedimentation issues in the area (i.e., the weighting on the Molly Creek project was lower because there are roads on both sides of creek. Thus the total affected stream miles = 0.9. Relative to all steelhead bearing streams in the Assessment Unit (54.5 miles from Streamnet), the projects resulted in a 1.7% improvement (0.9/54.5*100). EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS4	Musselshell Creek	1.1: Habitat Quantity: Anthropogenic Barriers	25.00%	30	30	56.7	90	75	90	Clearwater Subbasin Plan, NOAA Recovery Plan	2012: 14.4 miles of stream access to be restored 2015: Fixed tunnel problem in 2012, which opened 8 miles of new access. The 8 miles were adjusted by 80% to account for life history stage use (=6.4 miles). Relative to steelhead bearing stream miles in the Assessment Unit, (24 miles Streamnet steelhead miles are 6.9, but panel thought this incorrect. There are 10 miles of critical habitat! The Expert Panel considered gradient GIS layer and known fish use, intrinsic potential layer, and known natural barriers, and added known fish use e.g., fish are known to be in Gold Creek), this project resulted in a 26.7% improvement. EWL

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Snake River Steelhead	Lolo Creek	LOS4	Musselshell Creek	4.1: Riparian Condition: Riparian Vegetation	25.00%	60	60	60.4	70	67	75	NPT Lolo Creek monitoring report (2011) reports heavily impacted by history of logging, infrastructure development (roads, powerlines, etc), and/or grazing	2012: 4 miles of stream and wetland plantings at Deer Gulch. 2015:Deer Gulch project in 2013 treated 0.56 miles with 2 different treatments. Planting was heavily grazed by cattle, so the value of the project was significantly decreased (as indicated in weighting). Thus 0.084 stream miles were affected by this project. Considered over the 24 steelhead bearing stream miles in the Assessment Unit (Streamnet steelhead miles are 6.9, but panel thought this incorrect. There are 10 miles of critical habitat! The Expert Panel considered gradient GIS layer and known fish use, intrinsic potential layer, and known natural barriers, and added known fish use e.g., fish are known to be in Gold Creek), there was a 0.4% improvement. EWL 3.10.16

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Snake River Steelhead	Lolo Creek	LOS4	Musselshell Creek	7.2: Sediment Conditions: Increased Sediment Quantity	25.00%	40	40	41.6	55	55	60	Upper Lolo EAWS (2003): sediment standards can be between 45 % and 55% for 10 out of 30 years. Current sediment production is 25% over natural.	2012:15 miles s of road decommissioning and improvement in Lolo Insect and Disease 2015: The Expert Panel considered downstream benefits from the Deer Gulch restoration project occurring in 2013. It is a low-gradient section and scale of flow is captured in the project weighting. Of the 0.56 stream miles treated, there was an adjustment for the landscape position of the action and the potential improvements to 2018. Thus the improved stream miles = 0.378. Relative to steelhead bearing stream miles in the Assessment Unit (24 miles; Streamnet steelhead miles are 6.9, but panel thought this incorrect. There are 10 miles of critical habitat! The Expert Panel considered gradient GIS layer and known fish use, intrinsic potential layer, and known natural barriers, and added known fish use e.g., fish are known to be in Gold Creek), there was a 1.6% improvement for this limiting factor (0.378/24*100). EWL 3.10.16

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Snake River Steelhead	Lolo Creek	LOS4	Musselshell Creek	8.1: Water Quality: Temperature	25.00%	50	50	50.4	60	59	65	Upper Lolo EAWS (2003), NPT Lolo Creek monitoring report (2011) reports warm temperature due to loss of riparian cover due to grazing, elevation, geology, and influence of tributary streams	2012: From approximately 4 miles of stream and wetland planting at Deer Gulch. 2015: Recognizing that riparian vegetation projects also improve stream temperature from shading the Expert Panel considered improvements for this limiting factor similarly. Deer Gulch project in 2013 treated 0.56 miles with 2 different treatments. Planting was heavily grazed by cattle, so the value of the project was significantly decreased (as indicated in weighting). Thus 0.084 stream miles were affected by this project. Considered over the 24 steelhead bearing stream miles in the Assessment Unit (Streamnet steelhead miles are 6.9, but panel thought this incorrect. There are 10 miles of critical habitat! The Expert Panel considered gradient GIS layer and known fish use, intrinsic potential layer, and known natural barriers, and added known fish use e.g., fish are known to be in Gold Creek), there was a 0.4% improvement. EWL 3.10.16
Snake River Steelhead	Lolo Creek	LOS5	Yoosa Creek	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	85	85	85	90	85	90	Upper Lolo EAWS (2003): low pool quantity/quality and high cobble embeddedness levels in Yoosa Creek, which is caused by lack of instream (wood) and bank cover (wood/ vegetation).	2012: No actions planned. 2015: No actions were taken during 2012-2015, therefore no change to low bookend. EWL 2.10.16

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Snake River Steelhead	Lolo Creek	LOS5	Yoosa Creek	4.1: Riparian Condition: Riparian Vegetation	10.00%	60	60	60	70	60	75	Upper Lolo EAWS (2003): low pool quantity/quality and high cobble embeddedness levels in Yoosa Creek, which is caused by lack of instream (wood) and bank cover (wood/ vegetation).	2012: No actions planned. 2015: No actions were taken during 2012-2015, therefore no change to low bookend. EWL 2.10.16
Snake River Steelhead	Lolo Creek	LOS5	Yoosa Creek	7.2: Sediment Conditions: Increased Sediment Quantity	80.00%	55	55	55	65	65	75	Upper Lolo EAWS (2003): sediment estimated at 6 tons/sq miles/year and currently elevated by an estimated 33 percent over natural.	2012: Lolo insect and Disease EIS, approximately 20 miles of road decommissioning planned 2012: No actions planned. 2015: No actions were taken during 2012-2015, therefore no change to low bookend. EWL 2.10.16

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Snake River Steelhead	South Fork Clearwater River	SCS1	American River	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	75	80	100	90	80	90	Level of Certainty= 4 3. GIS mapping depicts 167 culverts in the American River Watershed. Best professional judgement that at least 10% are fish passage barriers blocking approximately 25% of the habitat. Target= 100% passable.	2012: Culvert surveys from 2012 show about 8 passage barriers; address 4 to 5 in 2012-18. A partial barrier at very low and very high flows still exists at the mouth of American River. This is an expensive project (approximately 500k) and cost-share funds are being pursued. 2015: Five access projects were accomplished, which opened 62 miles of river. Panel prorated improvements based on seasonal/partial blockages fixed and fish use (spawning and/or rearing) of affected miles. Discussion of proration based on time/season or percentage of fish passed. Out-migrating juveniles (low numbers) are regularly captured in American River (proving some passage, but not enough), but migration delays are thought to occur. 68% of adults are thought to pass, but juveniles are blocked by flows more often, so Panel prorated American culvert at 40%. Panel assigned 90% to areas with high potential to fail. Overall, with adjustments, the projects affected 26.42 stream miles. Taken over the entire Assessment Unit which

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Snake River Steelhead	South Fork Clearwater River	SCS1	American River	4.1: Riparian Condition: Riparian Vegetation	20.00%	35	35	35	65	45	80	Level of Certainty= 2. Loss of riparian veg from grazing, dredge mining, and urbanization. Occular observations. SF Cleawater River TMDL Appendix K (IDEQ 2003); American and Crooked River EIS (USFS 2005), Aquatic Specialist Report (USFS 2007). CNF and NPNF Matrix of Watershed Condition for Chinook, Steelhead, and Bull Trout is > 75% shade. Most sub-watersheds are less than 50%	2012: Approximately 2 miles of riparian area (10 acres) along American River will be planted. There are many miles left along the mainstem American River, Big Elk and Little Elk Creeks to be planted. Majority of these areas are on private land and future projects in these areas will be explored. 2015: There were no applicable actions accomplished during the 2012-2015 time frame, therefore there was no change to the low bookend. EWL 3.8.16
Snake River Steelhead	South Fork Clearwater River	SCS1	American River	4.2: Riparian Condition: LWD Recruitment	10.00%	50	50	50	65	52	75	Level of Certainty= 4. Loss of riparian veg from grazing, dredge mining, and urbanization. Occular observations, SF Cleawater River TMDL Appendix K (IDEQ 2003); American and Crooked River EIS (USFS 2005), Aquatic Specialist Report (USFS 2007). CNF and NPNF Matrix of Watershed Condition for Chinook, Steelhead, and Bull Trout is > 75% shade. Most sub-watersheds are less than 50%. Assume that floodplain projects will promote recruitment or woody debris will be physically added from restoration activities.	2012: Planting along American River will provide LWD recruitment in the long term. 2015: There were no applicable actions accomplished during the 2012-2015 time frame, therefore there was no change to the low bookend. EWL 3.8.16

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Snake River Steelhead	South Fork Clearwater River	SCS1	American River	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	10.00%	60	60	60	65	60	68	Level of Certainty= 3. Historic side channel and wetland condition is difficult to estimate. Since floodplains have been drastically altered and lost, it is likely that a significant amount of wetlands and side channels were also lost. Percent lost is based on an estimate of lost floodplains in the watershed. With the restoration of floodplain functions, it is likely that wetland and side channel functions will also be restored.	2012: No side channels or wetlands will be constructed or improved in this watershed by 2018. Projects are being explored for beyond 2018. 2015: There were no applicable actions accomplished during the 2012-2015 time frame, therefore there was no change to the low bookend. EWL 3.8.16
Snake River Steelhead	South Fork Clearwater River	SCS1	American River	5.2: Peripheral and Transitional Habitats: Floodplain Condition	15.00%	45	45	45	65	45	75	Level of Certainty= 4. Loss of floodplain for approximately 14 miles of American River, 4 miles of Buffalo Gulch due to dredge mining. Impaired floodplain function along 12 miles Big and Little Elk Creeks from grazing activities. No projects are planned that address this limiting factor before 2018.	2012: No floodplain or side channel work will be done by 2018. Projects are being explored for beyond 2018. 2015: There were no applicable actions accomplished during the 2012-2015 time frame, therefore there was no change to the low bookend. EWL 3.8.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS1	American River	6.2: Channel Structure and Form: Instream Structural Complexity	15.00%	50	50	50	70	50	75	Level of Certainty= 3.American River should have 140 pools per mile to meet the CNF and NPNF Matrix of Watershed Condition for Chinook, Steelhead, and Bull Trout. Pool frequency ranges from 18 pools per mile in American River to about 48 pools per mile in the tributaries (South Fork Clearwater River TMDL- Appendix K, 2003). Target for pool quantity based on stream width; pool quality >4, LWD near natural levels.	2012: No instream work will be done in the American River watershed by 2018. Projects are being explored for beyond 2018. 2015: There were no applicable actions accomplished during the 2012-2015 time frame, therefore there was no change to the low bookend. EWL 3.8.16

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Snake River Steelhead	South Fork Clearwater River	SCS1	American River	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	40	40	40.1	60	50	75	Level of Certainty = 3. 167 mapped culverts that are potentially sediment sources. Road surveys conducted in 2012 show that road densities are 2.5 miles per square mile. Approximately 75 miles of trail in American River watershed with the majority of trail miles in the riparian area.	2012: Approximately 70 miles of road are non-system roads and can potentially be decommissioned. 15-20 miles will be decommissioned by 2018. Grazing still exists on private land and are being explored for beyond 2018. 2015: One road decommissioning project occurred in 2012 , which fixed road sediment issues, mostly mid-slope, had 2 stream crossings, and treated 2.9 miles. Road density in the American River watershed is more than 2.3 miles/square mile. There is high cobble embeddedness in American main-stem. Regarding proration using road location: Forest Service counts only length of road within 300 ft of stream, but, due to concentration of flow by roads, this understates benefit to streams downstream of action. The Expert Panel prorated using slope position (3 categories: upland 10%, mid-slope 50%, and streamside 90%) and overall weighting relative to assessment unit (including slope, landslide-prone locations to account for high-elevation areas that can contribute more
Snake River Steelhead	South Fork Clearwater River	SCS1	American River	8.1: Water Quality: Temperature	5.00%	60	60	60	75	65	85	SF Clearwater River TMDL (2003) lists the majority of streams in the South Fork Clearwater Rivers as being impaired for temperature. Projects that improve riparian condition and instream complexity are likley to improve temperature conditions in the watershed.	2012: Benefits from riparian planting actions. 2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	80	80	80	90	83	90	Level of Certainty= 3. There are over 60 mapped stream crossings in the Crooked River watershed (GIS). Three of the larger tributaries have partial or complete fish barriers and contribute to 10% of the potential habitat. There are at least three other know barriers to streams with rearing habitat. Target= 100% fish passage.	2012: Replacing 2 culverts in Crooked River by 2018. 2015: No actions completed to address this limiting factor, therefore there is no change to the low bookend. EWL 2.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	4.1: Riparian Condition: Riparian Vegetation	20.00%	25	25	25.3	50	40	65	Level of Certainty= 3. Loss of floodplain for entire 12 miles of mainstem Crooked River. Loss of floodplain for lower 1 mile Five Mile Creek; loss of floodplain for lower Quartz Creek; loss of floodplain for lower 2 miles Relief Creek, loss of floodplain for lower 1 mile Rainbow Gulch Creek. Sources: local observation, American and Crooked River Project EIS 2005, SF Clearwater River Landscape Assessment 1998. Target= > 75% adequate shade.	2012: Benefits from the Crooked River Meanders project. Approximately 120 acres will be rehabilitated and new floodplain will be replanted. Approximately 1 mile of streambank will be planted along the mainstem Crooked River. 2015: The Expert Panel forecasted riparian growth/functional change for the Crooked River vegetation project out to 2018. Over 0.25 mile (one stream side), there was good survival, but 1 gallon plants are still small (2.5-3 ft tall), so the treated length of stream was adjusted to better represent the realized benefits to 2018 (using an estimate of average annual growth rates, but cottonwoods did not have high survival. Other vegetation grew 1-2 ft per year, depending on precipitation). To consider improvement relative to all steelhead stream miles in the Assessment Unit: the Expert Panel initially calculated Streamnet steelhead miles= 26.5, however later agreed to use 44 stream miles, using criteria of counting mainstem and main tributaries miles, but not counting stream "feet".

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Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	4.2: Riparian Condition: LWD Recruitment	5.00%	40	40	40	55	46	60	Level of Certainty= 4. Loss of floodplain for entire 12 miles of mainstem Crooked River. Loss of floodplain for lower 1 mile Five Mile Creek; loss of floodplain for lower Quartz Creek; loss of floodplain for lower 0.5 mile of Baker Gulch, loss of floodplain for lower 2 miles Relief Creek, loss of floodplain for lower 1 mile Rainbow Gulch Creek. Sources: personal observation, American and Crooked River EIS 2005, South Fork Landscape Assessment 2003.	2012: The Meanders project will use existing woody debris in the project area that would not likely be recruited to create instream habitat. Also, recontracting floodplain will allow woody debris from upstream to recruit in the lower two miles instead of being passed through. Plantings in the valley bottom will provide future woody debris recruitment. 2015: While there is one action completed in the 2012-2015 timeframe, and it was hoped that plantings will affect this limiting factor in the long term, it has no measureable benefit from 2013 when plantings were made through 2018. Further, cottonwood survival was low and most survivors were shrubby species, and thus will not provide large wood. Therefore, there is no change to the low bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	10.00%	35	35	35	45	45	50	Level of Certainty= 5. Historic side channel and wetland condition is difficult to estimate. Since floodplains have been drastically altered and lost, it is likely that a significant amount of wetlands and side channels were also lost. Percent lost is based on an estimate of lost floodplains in the watershed. With the restoration of floodplain functions, it is likely that wetland and side channel functions will also be restored.	2012: Design criteria from 2012 show increased side channels accessible to fish during all flows. Design criteria also provides wetland meadows adjacent to Crooked River in place of dredge ponds. 2015: No actions completed to address this limiting factor, therefore there is no change to the low bookend. EWL 2.9.16
Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	5.2: Peripheral and Transitional Habitats: Floodplain Condition	20.00%	35	35	35	50	50	60	Level of Certainty= 4. Loss of floodplain for entire 12 miles of mainstem Crooked River. Loss of floodplain for lower 1 mile Five Mile Creek; loss of floodplain for lower Quartz Creek; loss of floodplain for lower 2 miles Relief Creek, loss of floodplain for lower 1 mile Rainbow Gulch Creek. Sources: local observation, American and Crooked River EIS 2005, South Fork Landscape Assessment 2003.	2012: Design criteria from 2012 shows that by removing mine tailings along the lower 2 miles of Crooked River approx. 120 acres of floodplain, with various stages of flooding, will be provided. 2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	40	40	40	65	60	80	Level of Certainty= 3. Loss of natural channel morphology for entire mainstem Crooked River (12 miles); loss of natural channel morphology for lower 2 miles Relief Creek. SF Clearwater River Subbasin Assessment- Appendix K (IDEQ 2003); Crooked River Habitat Improvement Project (USFS 1985); South Fork Clearwater Landscape Assessment 1998. Target= Pool quantity based on channel width, pool quality >4, LWD near natural levels.	2012: Design criteria from 2012 field season show an increase of approximately 1 mile of new stream channel and approx. 4 miles of improved instream structural complexity. 2015: No actions completed to address this limiting factor, therefore there is no change to the low bookend. EWL 2.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	60	60	60.5	65	65	70	Level of Certainty= 4. Percent fines in Crooked River watershed approximately 15% (IDEQ Appendix K, 2003). There are 38 mapped culverts in the watershed. The majority of those are high in the watershed and likely sources of fine sediment. Road density is approximately 2.0 miles per square mile. Watershed condition indicators suggest >1 mi per square mile. Target= Embeddedness <20%, surface fines <20 % for C&E channels and <10 % for A&B Channels.	2012:Two culverts are being replaced in the Crooked River watershed by 2018, which will reduce some sediment. Projects that will affect levels of sediment the most are planned beyond 2018. However, the Meanders project will provide better sediment transport in the lower two valley miles. 2015:The Expert Panel contemplated chronic sedimentation vs. unquantified acute risk from failures. The action that occurred on the 311 Road, East Fork Crooked Creek, affected a relatively small area. The watershed above had recently burned, and there was some scour at the culvert: 1-2 cubic yards had been scoured, plus there was risk of approximately 200 cubic yards from potential future failure. The Expert Panel chose to use the an adjustment that assigned 90% improvement recognizing this was not a chronic sediment source but rather an area with high potential to fail. Determining how much of an impact that potential failure would have to the whole assessment unit was

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Snake River Steelhead	South Fork Clearwater River	SCS2	Crooked River	8.1: Water Quality: Temperature	5.00%	60	60	60	70	68	80	SF Clearwater River TMDL (2003) lists the majority of streams in the South Fork Clearwater Rivers as being impaired for temperature. Projects that improve riparian condition and instream complexity are likely to improve temperature conditions in the watershed.	2012:Improvements from the Meanders project. Restoring the floodplain will provide better groundwater connection and reducing the amount of exposed surface water in the ponds will reduce overall stream temperatures in the lower Crooked River. 2015: Water temperatures are high in Crooked River. While there is one action completed in the 2012-2015 timeframe, and there is recognition that plantings will affect this limiting factor in the long term, it has no measureable benefit from 2013 when plantings were made through 2018. Further, cottonwood survival was low and most survivors were shrubby species, which may provide shading over the long term. However, currently, there is no change to the low bookend. EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS3	John's Creek	1.1: Habitat Quantity: Anthropogenic Barriers	20.00%	80	80	80	90	85	90	LOC:4 There are 9 known road crossings, based on stream miles blocked and assuming 3 are barriers, this results in a LBE of 80% and assuming 2 could be replaced by 2018 results in a HBE of 90%. Future crossing inventory and assessment is needed to prioritize actions.	1 unidentified stream crossing is planned in the Hugary Ridge EIS for 2013-2018. Based on stream miles blocked and the total number of stream miles in the AU replacing 1 culvert in 2013- 2018 gets to us to 85% 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no improvement to the low bookend. EWL 2.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS3	John's Creek	4.1: Riparian Condition: Riparian Vegetation	40.00%	80	80	80	85	85	90	LOC: 4 Specific areas of the watershed are affected by livestock resulting in loss of stream bank stability and increased width depth ratio. Goal bank stability of greater than 90% and width depth ratio of less than 10. Current conditions are approximately 70-80% and width depth ratios are 15-20	2012:Slight additional benefit from road decommissioning reducing impacts to riparian zone. No additional activities planned for 2013-2018. 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no improvement to the low bookend. EWL 2.9.16
Snake River Steelhead	South Fork Clearwater River	SCS3	John's Creek	7.2: Sediment Conditions: Increased Sediment Quantity	40.00%	80	80	80	85	84	90	LOC: 4 Goal for cobble embeddedness is less than 30%; ocular estimates of cobble embeddedness in Johns Creek is less than 40%. Goal for road density is 1 mile/sq. mile. Current road density in the roaded portion is 2.2 mi./sq. mi. There are 54 miles of known roads in the drainage. Additonal non inventoried roads increase road densities above stated values.	2012: 5 miles decommissioning in the roaded portion planned for 2013-2018. 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no improvement to the low bookend. EWL 2.9.16
Snake River Steelhead	South Fork Clearwater River	SCS4	Meadow Creek	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	80	80	80	90	80	90	LOC: 2. There are 67 known road crossings, 34 are known barriers based on stream miles blocked , this results in a LBE of 80% and assuming 8 could be replaced by 2018 results in a HBE of 90%. Future crossing inventory and assessment is needed to priotitize actions.	2012: No actions planned for 2013-2018 2015: No actions were undertaken during 2012-2015 that address this limiting factor, therefore there is no change to low bookend

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Snake River Steelhead	South Fork Clearwater River	SCS4	Meadow Creek	4.1: Riparian Condition: Riparian Vegetation	15.00%	60	60	61.1	70	70	75	LOC: 3 Specific areas of the watershed are affected by livestock resulting in loss of stream bank stability and increased width depth ratio. Goal bank stability of greater than 90% and width depth ratio of less than 10.	2012: 3.0 miles riparian planting planned for 2013-2018. Additional benefit from road decommissioning reducing access to riparian zone. 2015 A 1-mile planting project occurred at McComas Meadows from 2012 through 2015. The entire area was not intensely treated, only 0.25 mile per year. A riparian weed treatment of 0.25 mile also occurred but it was not a stand-alone action, but rather part of many projects, so assigned 0 miles in the end. The Expert Panel adjusted the functional miles treated by prorating based on percentage of properly functioning condition expected by 2018: anywhere from 15% to 30% depending on what year the action occurred (assumes 5% improvement=growth/year). The resultant stream miles affected by the prorated actions = 0.225 and made relative to all the steelhead stream miles in the Assessment Unit. Streamnet steelhead distribution is 15 miles and includes mainstem and not North Meadow. The Expert Panel added 6.0 miles of additional tributary
Snake River Steelhead	South Fork Clearwater River	SCS4	Meadow Creek	4.2: Riparian Condition: LWD Recruitment	15.00%	65	65	65	70	65	75	LOC: 4. Lack of recruitment of riparian vegetation in some areas has resulted in less than desired LWD. Goal is greater than 30 pieces of LWD per mile.	2012: 3.0 miles riparian planting planned for 2013-2018. Riparian planting will not provide LWD recruitment until the long term (75 plus years). 2015: Riparian vegetation projects would not improve conditions for this limiting factor within 2012-2018 period. Furthermore planted species would not provide large wood. Therefore, there was no change assessed from the low bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS4	Meadow Creek	7.2: Sediment Conditions: Increased Sediment Quantity	45.00%	50	50	50.7	70	60	75	LOC: 4 Goal for cobble embeddedness is less than 30%; occular estimates of cobble embeddedness in Meadow Creek is less than 40%. Goal for road density is 1 mile/sq. mile. Current road density is 4.6 mi./sq. mi. There are 174 miles of known roads in the drainage. Additonal non inventoried roads increase road densities above stated values.	2012:15 miles decommissioning planned for 2013-2018. Additional benefit from 3.0 miles riparian planting planned for 2013-2018. 2015: Meadow Face Road Decommissioning III (2012) and IV (2014) occurred in separate locations in the Assessment Unit. Improved stream miles were estimated by measuring down to next downstream major tributary junction, then adjusted by slope position and weighted by considering all existing anthropogenic sediment sources including grazing, mining, etc. Resultant metric was 0.15 miles of stream improved by the action and assessed over total steelhead stream miles in the Assessment Unit (21 miles). Therefore, $0.15/21 \times 100 = 0.7\%$ improvement over low bookend. EWL 3.9.16.

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Snake River Steelhead	South Fork Clearwater River	SCS4	Meadow Creek	8.1: Water Quality: Temperature	15.00%	65	65	66.1	70	70	75	LOC: 2. Goal is 20 degree max and 16 degree max for spawning. Over 40 days annually exceeded 20 degrees in each of the past few years.	2012: 3.0 miles riparian planting planned for 2013-2018. Recent trends show 20-25 days exceedence. 2015: Because vegetative shading cools stream temperature, the Expert Panel considered riparian projects listed under limiting factor 4.1 as improving limiting factor 8.1. A 1-mile planting project occurred at McComas Meadows from 2012 through 2015. The entire area was not intensely treated, only 0.25 mile per year. A riparian weed treatment of 0.25 mile also occurred but it was not a stand-alone action, but rather part of many projects, so assigned 0 miles in the end. The Expert Panel adjusted the functional miles treated by prorating based on percentage of properly functioning condition expected by 2018: anywhere from 15% to 30% depending on what year the action occurred (assumes 5% improvement=growth/year). The resultant stream miles affected by the prorated actions = 0.225 and made relative to all the steelhead stream miles in the Assessment Unit. Stream steelhead distribution is 15

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Snake River Steelhead	South Fork Clearwater River	SCS5	Mill Creek	1.1: Habitat Quantity: Anthropogenic Barriers	15.00%	83	90	91.9	94	90	94	LOC: 3 There are 48 known road crossings, based on stream miles blocked 10 a known as barriers, this results in a LBE of 83% and assuming 6 could be replaced by 2018 results in a HBE of 94%. Future crossing inventory and assessment is needed to prioritize actions.	2012: 4 stream crossings a scheduled for 2013-2018, 2 at Black George, Hunt Creek, and 1 with the planned road decommissioning. Based on stream miles blocked and the total number of stream miles in the AU replacing /removing these culverts in 2013-2018 gets to us to 90% 2015: Three passage projects occurred between 2012 and 2015, over 4.3 stream miles. An upstream barrier still exists on Adams Creek. The Expert Panel adjusted miles of improvement based on distinguishing full/partial barriers and adult/juvenile blockage for a realized improvement to 2.15 stream miles (changed from 3.7 miles as per QA review of Lookback materials, EWW 7.6.16) of stream. Overall improvement to the Assessment Unit was assessed by making improved stream miles relative to all steelhead stream miles in the Assessment Unit. Using Streamnet, they calculated 15.1 miles in mainstem Mill Creek. Then the Expert Panel added tributaries with known spawning and rearing (Merton 2 miles, Black George 4 miles, Hunt 3 miles,

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Snake River Steelhead	South Fork Clearwater River	SCS5	Mill Creek	4.1: Riparian Condition: Riparian Vegetation	30.00%	60	60	60.1	70	67	75	LOC: 3 Specific areas of the watershed are affected by livestock resulting in loss of stream bank stability and increased width depth ratio. Goal bank stability of greater than 90% and width depth ratio of less than 10.	2012: 1.0 miles riparian planting planned for 2013-2018. Additional benefit from road decommissioning reducing access to riparian zone. 2015: Four Mill Creek projects occurred, with 0.1 mile planted annually for 4 years. Total miles treated was adjusted to account for spatial overlap and a % improvement factor (5%/year) to account for vegetation growing over time. The resultant total miles improved by the actions was 0.0225. Assessed over all steelhead bearing river miles in the Assessment Unit (24.1), the Expert Panel calculated a 0.1% improvement over the low bookend. EWL 3.9.16.
Snake River Steelhead	South Fork Clearwater River	SCS5	Mill Creek	4.2: Riparian Condition: LWD Recruitment	20.00%	60	60	60	65	60	70	LOC: 4. Lack of recruitment of riparian vegetation in some areas has resulted in less than desired LWD. Goal is greater than 30 pieces of LWD per mile.	2012: 1.0 miles riparian planting planned for 2013-2018. Riparian planting will not provide LWD recruitment until the long term (75 plus years). 2015: No actions undertaken during 2012-2015 that address this limiting factor, therefore no change to low bookend. EWL 2.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS5	Mill Creek	7.2: Sediment Conditions: Increased Sediment Quantity	20.00%	70	70	71	75	73	80	LOC: 4 Goal for cobble embeddedness is less than 30%; occular estimates of cobble embeddedness in Meadow Creek is less than 40%. Goal for road density is 2 mile/sq. mile. Current road density is 2.6 mi./sq. mi. There are 95 miles of known roads in the drainage. Additonal non inventoried roads increase road densities above stated values.	2012: 10 miles decommissioning planned for 2013-2018. Additional benefit from 1.0 miles riparian planting planned for 2013-2018. 2015: Fixed an ATV and cattle ford that was a chronic sediment source by installing bridge over Mill Creek, which improved 0.5 miles but weighted with other anthropogenic sediment sources in that area, the total stream miles affected was 0.25. Relative to the 24.1 steelhead bearing stream miles in the Assessment Unit, the Expert Panel estimated a 1.0% improvement. EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS5	Mill Creek	8.1: Water Quality: Temperature	15.00%	70	70	70.1	75	75	85	LOC: 2. Goal is 20 degree max and 16 degree max for spawning. Over 30 days annually exceeded 20 degrees in each of the past few years.	2012: 1.0 miles riparian planting planned for 2013-2018. Recent trends show 10-15 days excedence. 2015: Because vegetation shades streams and cools water: 2015: Four Mill Creek projects, with 0.1 mile planted annually for 4 years, were considered as projects to benefit this limiting factor. Total miles treated was adjusted to account for spatial overlap and a % improvement factor (5%/year) to account for vegetation growing over time. The resultant total miles improved by the actions was 0.0225. Assessed over all steelhead bearing river miles in the Assessment Unit (24.1), the Expert Panel calculated a 0.1% improvement over the low bookend. EWL 3.9.16.

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Snake River Steelhead	South Fork Clearwater River	SCS6	Misc Clearwater Tribs	1.1: Habitat Quantity: Anthropogenic Barriers	25.00%	75	75	75	80	77	80	LOC: 4 There are 168 known road crossings, based on stream miles and assuming 42 are barriers, this results in a LBE of 75% and assuming 8 could be replaced by 2018 results in a HBE of 80%. Future crossing inventory and assessment is needed to prioritize actions. Reassigned LF based on review of watershed conditions and goals.	2012: 3 stream crossings a scheduled for 2013-2018, 2 at Black George, Hunt Creek, and 1 with the planned road decommissioning. Based on stream miles blocked and the total number of stream miles in the AU replacing /removing these culverts in 2013-2018 gets to us to 77% 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no increase in the lowbookend. EWL 2.9.16
Snake River Steelhead	South Fork Clearwater River	SCS6	Misc Clearwater Tribs	4.1: Riparian Condition: Riparian Vegetation	25.00%	60	60	60	70	60	80	LOC: 4 Specific areas of the watershed are affected by livestock resulting in loss of stream bank stability and increased width depth ratio. Goal bank stability of greater than 90% and width depth ratio of less than 10. Reassigned LF based on review of watershed conditions and goals.	2012: No actions planned for 2013-2018 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no increase in the lowbookend. EWL 2.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS6	Misc Clearwater Tribs	7.2: Sediment Conditions: Increased Sediment Quantity	35.00%	50	55	57.9	60	60	70	LOC: 4 Goal for cobble embeddedness is less than 30%. Goal for road density is 2 mile/sq. mile. Current road density is 2.6 mi./sq. mi. There are 163 miles of known roads in the drainage. Additional non inventoried roads increase road densities above stated values. Reassigned LF based on review of watershed conditions and goals.	2012: 30 miles decommissioning in the roaded portion planned for 2013-2018. Additional benefits 5.1 miles road improvement planned for Leggett and Peasley Creeks 2015: Road 469 failure fix reduced sediment input to stream. Miles affected by the action was adjusted by the location of the road relative to the stream and the total benefit possible. Thus the realized improved miles = 1.8 (modified from 3.24 on 7.6.16 by EWW post Nez Perce Tribe's Lookback QA review). Relative improvement as a result of this project over all steelhead bearing stream miles in the Assessment Unit =22.8 from USFS distribution maps (*Modified from 18.9 from Streamnet by Nez Perce Tribe, post Lookback QA, EWW) is 1.8/22.8*100= 7.9% improvement over low bookend. Nez Perce Tribe comment "Excess roads and potentially failing culverts still exist adjacent to these other Steelhead streams and need to be addressed." EWL 3.9.16 (Modified by EWW on 7.6.16)
Snake River Steelhead	South Fork Clearwater River	SCS6	Misc Clearwater Tribs	8.1: Water Quality: Temperature	15.00%	60	60	60	65	60	75	LOC:4 The NPPC 1994 standards 20 degree max and 16 degree max for spawning is exceeded annually. Reassigned LF based on review of watershed conditions and goals.	2012: No actions planned for 2013-2018 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no increase in the lowbookend. EWL 2.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	83	83	83	90	83	90	LOC: 2. Only 2 high priority culverts for fish passage identified (both replaced already). More may be found upon further investigation.	2102: Identified high priority culverts for fish passage replaced already. No actions planned, but more may be found upon further investigation. 2015: No actions undertaken during 2012-2015 to address this limiting factor, therefore there was no increase in the lowbookend. EWL 2.9.16
Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	4.1: Riparian Condition: Riparian Vegetation	10.00%	45	45	47	50	55	65	LOC: 3. Newsome Watershed Assessment (EAWS) recommended riparian restoration for reaches heavily impacted by dredge mining and streamside roads (approx. 10 stream miles)	2012: All stream and floodplain restoration to be planted by 2018. 2015: In 2014, planted some conifers, but was mostly willows in 2.5 miles of the riparian zone. Used large planting stock: 1-5 gallon, so benefits should accrue relatively quickly, and survival was good -in the 90% range. The Expert Panel adjusted miles treated by assuming 10% growth/year (40%) through 2018. To assess improvement relative to all steelhead bearing streams in the Assessment Unit, the Expert Panel used Streamnet's 51.1 steelhead miles. Therefore, $1/51.1 \times 100 = 2\%$ improvement above low bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	4.2: Riparian Condition: LWD Recruitment	10.00%	40	40	40.2	42	40	45	LOC: 3. Newsome Watershed Assessment (EAWS) recommended riparian restoration for reaches heavily impacted by dredge mining and streamside roads (approx. 10 stream miles)	2012: Conifers will be planted as part of the floodplain/valley bottom revegetation after the stream restoration complete. The benefits from planting on LWD is a long-term benefit (75 years plus). 2015: In 2014, planted some conifers, but was mostly willows in 2.5 miles of the riparian zone. Used large planting stock: 1-5 gallon, so benefits should accrue relatively quickly, and survival was good - in the 90% range. The Expert Panel adjusted miles treated by a 4% improvement factor through 2018. To assess improvement relative to all steelhead bearing streams in the Assessment Unit, the Expert Panel used Streamnet's 51.1 steelhead miles. Therefore, $0.1/51.1 \times 100 = 0.2\%$ improvement above low bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	5.2: Peripheral and Transitional Habitats: Floodplain Condition	15.00%	40	50	60.8	55	57	65	LOC: 3. Newsome EAWS recommends restoration of areas impacted by dredge mining (approx 8 miles)	2012: Reach 2 will be implemented over a 2-3 year period to maximize floodplain connectivity. 2015: Mine tailing project (divided into 4 phases): watershed assessment guided phasing and priorities. Expert Panel adjusted miles treated based on extent of treatment. Reach 2 was given 100%, due to extent and treatment, and Reach 3 was 90%. Thus, the miles treated = 2.495. The improvement relative to all steelhead bearing stream miles in the Assessment Unit was calculated by starting with the 51.1 miles, which includes tributaries, but not floodplain, so panel excluded many miles based on channel types. They used 12 miles (11 miles of mainstem, plus a little more for the mouths). Therefore, $2.495/12 \times 100 = 20.8\%$ improvement over the low bookend. The Expert Panel expected a large improvement from this project. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	6.2: Channel Structure and Form: Instream Structural Complexity	40.00%	40	40	42.3	60	55	65	LOC: 3. Newsome Watershed Assessment (EAWS) recommended stream habitat complexity for the entire mainstem from the mouth up to Radcliff Creek (approx. 11 miles)	2012: Reach 2 will be implemented over a 1-2 year period after the floodplain has been reconnected. Newsome Cr. From the mouth to the townsite will be evaluated as well. The stream restoration includes the installation of approximately 350 instream structures. 2015:Newsome Restoration project treated 0.15 miles, with wood treatment along entire section. No remeandering occurred. Reference reach has 35 pieces per 100 meters. Installed 13 large wood structures with 7-9 logs per structure, which is 104 pieces in 0.5 mile, ~13 pieces per 100 m; however, panel thought that wood was at capacity in treated reach and there was no room for more, so at 100% for wood. Considered channel change through time to 2018 for adjustment of miles treated: it is on the right trajectory, but not there yet. Full action has been done, but creek is still adjusting, so prorated benefit to 50%. Thus, miles treated = 0.275. Assessed over 12 miles of steelhead bearing stream in the Assessment Unit

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Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	42	42	42.2	70	47	75	LOC: 2. Newsome Watershed Assessment (EAWS) recommended road density reduction from 3.4 mi/mi^2 to 1.4 mi/mi^2	2012: Approx. 168 miles of roads covered under NEPA. Road improvement and decommissioning will take several years to complete. 2015:Haysfork project repaired large "glory hole" and sediment pond, berm. 80% has stabilized with vegetation. Pond was no longer needed or functioning. Project removed berm to avoid sedimentation and potential failure. There was no current erosion, but was expected to present large future risk. Project improved mainstem down to Newsome Town site = 3.5 miles. The location was mid-slope, so the Expert Panel adjusted miles treated by 50%, and assessed a 5% weighting factor for total possible benefit. Relative improvement across the Assessment Unit was calculated using 51.1 Streamnet miles because all contributing water affects sediment downstream. Therefore, 0.0875/51.1*100=0.2% improvement over low bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS7	Newsome Creek	8.1: Water Quality: Temperature	5.00%	60	60	61.2	65	65	70	LOC: 3. Newsome Watershed Assessment (EAWS) cites dredge mining and reduced vegetation cover as major contributors to increased stream temps.	2012: Benefits from vegetation planting and channel work. Hyporheic flow 2015: All phases of Newsome Creek tailings removal project were considered cumulatively for this limiting factor. Previously, the area consisted of ponds, and no riparian vegetation. Now there is less water warming due to vegetation plantings. Total project miles=4, and conditions are expected to improve 15% through 2018. Relative to the 51.1 steelhead occupied river miles (from Streamnet), the estimated improvement from this project = $0.6/51.1 \times 100 = 1.2\%$. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	60	60	64.8	80	65	80	LOC: 2. 200 stream/road crossings. 40 are passage barriers.	2012: Six crossings currently indentified and prioritized for design and replacement. Additional culverts will be addressed in outyears (beyond 2018). 2015: Four culvert replacements opened 9 miles of juvenile rearing stream. Spawning occurs in mainstem. The small creeks in this area, even low order, have higher productivity than expected given how high in the watershed they are. Water temperatures are cold, so they are valuable future refuge. All culverts replacements removed full barriers with outlet drops. Still 8-10 high priority culverts remaining to be replaced. Expert Panel adjusted miles of stream improvement by 50% (to 4.5 miles) based on known other passage issues in area affected and steelhead life history stage. Relative improvement in the Assessment Unit was calculated using steelhead bearing stream miles from Streamnet (83.1 miles), but then added 3 miles of Dawson Creek up to headwaters, 3 miles of Ditch Creek, 2 miles of Jungle Creek, 1.5 miles of Salmon Creek.

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Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	4.1: Riparian Condition: Riparian Vegetation	25.00%	50	50	51.1	65	65	75	LOC 2:RR EAWS - loss of large established woody veg in meadows. Red Pines NEPA clears 32 miles for planting. LOC: 2. Red River EAWS recommends easements and/or land purchase on private meadow in-holdings	2012: 36-48 streambank (one side of river) miles total to be planted. Estimate does not include future potential conservation easements or land purchases. 2015: Red River Meadows conservation easement planting project treated both sides of stream, so using stream miles (2 miles) as initial metric. They used larger (1 gallon) rooted stock, and had good survival of alder (less susceptible to browse than willow), and used trench planting, intense in some selected areas. Vegetation response is expected to be good and the Expert Panel adjusted the miles treated by 50% (10%/year improvement) to account for delayed responses through 2018. Relative to steelhead bearing stream miles in the Assessment Unit (94.1, which are Streamnet miles plus 11 miles from local knowledge refinement) the project resulted in an improvement of 1.1% for this Limiting Factor (1.004/94.1*100). EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	4.2: Riparian Condition: LWD Recruitment	5.00%	60	60	60	65	60	70	Red River EAWS identifies lack of LWD due to streamside roads & past dredge mining. Most of RR has streamside roads or is meadow complexes.	2012:Conifers will be planted as part of the floodplain/valley bottom revegetation after the stream restoration complete. The benefit from riparian planting on LWD is a long-term benefit. 2015: No large wood was planted during the 2012-2015 timeframe, therefore there was no change from the low bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	5.2: Peripheral and Transitional Habitats: Floodplain Condition	5.00%	65	65	65	75	73	80	LOC: 2. RR EAWS identified RR Narrows as key project for floodplain restoration (2 stream miles). Some work exists on private property as well.	2012: Benefits estimated include channel restoration. This reflects a combination of multiple WEs. 2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	6.2: Channel Structure and Form: Instream Structural Complexity	20.00%	40	40	40	60	47	70	LOC: 2. Red River Narrows project area key area for restoration (2 miles). Meadows also simplified habitat (approx. 12 miles)	2012: Estimate is a combination of multiple WEs. Meadows will not have LWD structures placed, will focus on floodplain connectivity and revegetation. 2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	7.2: Sediment Conditions: Increased Sediment Quantity	20.00%	50	50	58.3	70	62	80	LOC: 2. Road densities are 3.6 mi/mi^2. Goal for road densities are 1.0 mi./sq. mi.	2012: 45-50 miles total of road decommissioning and 10-15 miles of road improvements to be completed. Road density is taken from 1998 data. NPT and FS has implemented many miles of road decommissioning watershed wide to date. 2015: Miles of stream improved by four projects were adjusted to reflect their proximity of road project to stream (e.g., Deadwood was mostly stream-side and mid-slope (65% weight)), and total benefit possible given other influences on this limiting factor. Still have 65 miles of road to improve and 46 miles to decommission, meaning that 25% of work remains to be done. Relative to the 94.1 miles of steelhead bearing stream in the Assessment Unit (STreamnet plus 11 miles addition based on local knowledge), there was 8.3% improvement (7.8/94.1*100). This is validated by sediment monitoring, indicating improvements compared to 1980s. EWL 3.9.16

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Snake River Steelhead	South Fork Clearwater River	SCS8	Red River	8.1: Water Quality: Temperature	15.00%	40	40	40	60	55	70	LOC: 2. RR EAWS - temps commonly exceeded in mainstem RR, streamside shading reduced.	2012: Benefits from stream & floodplain restoration (hyphorheic flow) as well as riparian planting work. 2015: Benefits from vegetation planting projects were applied to this limiting factor because as the vegetation grows up, it will shade the streams and cool them. Red River Meadows conservation easement planting project treated both sides of stream, so using stream miles (2 miles) as initial metric. They used larger (1 gallon) rooted stock, and had good survival of alder (less susceptible to browse than willow), and used trench planting, intense in some selected areas. Still, the Expert Panel recognizes it will take a while before the temperature benefits from the plantings will be measurable (about 0.5%/year of growth), and miles treated was adjusted to reflect this low value. Thus, essentially, there were zero miles of stream that would benefit from the action. Therefore, there was no change from the low bookend. EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS9	South Fork Clearwater Mainstem	6.2: Channel Structure and Form: Instream Structural Complexity	20.00%	60	60	60	70	60	75		2012: No actions for 2013-2018 planned. 2015: No actions undertaken during the 2012-2015 timeframe, therefore there was no change from the low bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS9	South Fork Clearwater Mainstem	7.2: Sediment Conditions: Increased Sediment Quantity	40.00%	60	60	61.75	70	67	75	LOC: 4 Improvements would come from habitat actions within the tributaries.	2012: No actions for 2013-2018 planned. Benefits attributed to upstream tributary improvements including road improvements, riparian improvments, riparian production, and road decmmissioning. 2015: Collective benefits of projects in tributatires (upstream assessment units (30.9) miles affected. Average of uplifts for all AUs putting sediment into the mainstem is 3.7%, but the Expert Panel adjusted this estimate down based on best professional judgment. Therefore, improvement to this Assessment Unit is 1.75%. EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS9	South Fork Clearwater Mainstem	8.1: Water Quality: Temperature	40.00%	50	50	50	60	60	70	LOC:4 Improvements would come from habitat actions within the tributaries.	2012: No actions for 2013-2018 planned. Benefits attributed to upstream tributary improvements including road improvements, riparian improvments, riparian production, and road decmmissioning. 2015: While all other Southfork Clearwater Assessment Units drain into this one, there is no expectation that temperature improvements from those projects would be realized here. Therefore, there were no actions and no change from low bookend. EWL 3.9.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Steelhead	South Fork Clearwater River	SCS10	Ten Mile Creek	1.1: Habitat Quantity: Anthropogenic Barriers	30.00%	85	85	85	95	90	95	LOC:4 There are 9 known road crossings, based on stream miles and assuming 2 are barriers, this results in a LBE of 85% and assuming 1 could be replaced by 2018 results in a HBE of 95%. Future crossing inventory and assessment is needed to prioritize actions.	2012: 1 unidentified stream crossings a scheduled for 2013-2018. Based on stream miles blocked and the total number of stream miles in the AU replacing/removing this culvert in 2013- 2018 gets to us to 90% 2015: There were no actions undertaken during the 2012-2015 time frame, therefore, there was no change from Low Bookend. EWL 3.9.16
Snake River Steelhead	South Fork Clearwater River	SCS10	Ten Mile Creek	7.2: Sediment Conditions: Increased Sediment Quantity	70.00%	82	82	83.9	87	87	90	LOC: 4 Goal for cobble embeddedness is less than 30%; ocular estimates of cobble embeddedness in Ten Mile Creek is less than 40%. Goal for road density is 2 mile/sq. mile. Current road density in the roaded portion is 1.2 mi./sq. mi. There are 29 miles of known roads in the drainage. Additional non inventoried roads increase road densities above stated values.	2012: Sediment reduction due to Tenmile Creek Bridge replacement. 2015: The Ten Mile project in 2012 included replacement of failing bridge with wide span. This was a preventative action to reduce risk of erosion/failure: otherwise, it would have continued to erode at each peak flow. The road continues up to SCS6. Project affected 4 miles of stream, and those miles were adjusted 90% for landscape/slope position and 10% for other human-caused sedimentation in area (other roads, timber harvest) and upstream for total stream miles affected=0.36. The Expert Panel used Streamnet steelhead miles in the Assessment Unit=18.5 miles to assess the relative benefit of the project across the Assessment Unit. Therefore $0.36/18.5*100 = 1.9\%$ improvement over the low bookend. EWL 3.9.16

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Snake River Steelhead	Selway River	SRS1	Lower Selway River	1.1: Habitat Quantity: Anthropogenic Barriers	30.00%	75	83	84.5	90	83	90	LOC: 3. 4 large stream crossings were identified as passage barriers. 2 have been relaced with 2 remaining. Surveys need to be completed in remainder of Lower Drainage.	2012:3 culvert replacements for approx. 24 miles upstream passage 2015: The Expert Panel evaluated the benefits from 3 barrier removal projects, and weighted the effectiveness of the actions by adjusting miles opened by proration based on life-history stage use and if it is a full vs. partial barrier (=5.75 miles). To assess the benefits of these actions over the entire Assessment Unit, the Panel considered steelhead miles in Streamnet (39.4), and added more miles based on local knowledge of fish distribution (an additional 21 miles), which totaled 60.4 total river miles occupied by Steelhead. Therefore $5.75/60.4*100=9.5\%$ improvement. EWL 3.8.16
Snake River Steelhead	Selway River	SRS1	Lower Selway River	7.2: Sediment Conditions: Increased Sediment Quantity	50.00%	65	65	65.1	75	69	80	LOC: 4 Goal for cobble embeddedness is less than 30%. Goal for road density is 1 mile/sq. mile.	2012: 20-30 miles of road improvement/decommissioning 2015: One project that affected 1 mile was weighted for landscape/slope position and total benefit possible/other anthropogenic sediment sources (=0.045 miles). Relative to the 60.4 river miles of steelhead habitat, the Expert Panel estimated a 0.1% uplift ($0.045/60.4*100$). EWL 3.8.16
Snake River Steelhead	Selway River	SRS1	Lower Selway River	8.1: Water Quality: Temperature	20.00%	60	60	60	65	60	70	LOC: 2. Goal is (20 degree max and 16 degree max for spawning), average temperature for the lower Selway River is over 19 degrees (2001).	2012: No actions planned 2015: No actions were undertaken during the 2012-2015 timeperiod, therefore there was not change from the Low Bookend. EWL 3.8.16

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Snake River Steelhead	Selway River	SRS2	Meadow Creek	7.2: Sediment Conditions: Increased Sediment Quantity	100.00%	90	90	90	95	93	95	LOC: 3. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) describe sediment yield as 8% over base levels.	2012: Horse Creek Road improvement/decommission, Falls Creek Road improvement 2015: No actions were undertaken during the 2012-2015 timeperiod, therefore there was not change from the Low Bookend. EWL 3.8.16
Snake River Steelhead	Selway River	SRS3	O'Hara Creek	4.1: Riparian Condition: Riparian Vegetation	20.00%	60	60	60	70	70	75	LOC: 2. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) cites that stream temperatures in the Selway at Ohara Creek average 19.5 degrees C.	2012: Plant 3 miles of riparian vegetation-O'Hara Creek 2015: 2015: No actions were undertaken during the 2012-2015 timeperiod, therefore there was not change from the Low Bookend. EWL 3.8.16
Snake River Steelhead	Selway River	SRS3	O'Hara Creek	7.2: Sediment Conditions: Increased Sediment Quantity	60.00%	50	50	54.8	65	62	75	LOC: 3. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) describe road density at approx 1.8 mi/sq. mi with 52 miles of excess roads. Goal is 1 mi/sq. mi. Culverts should be inventoried for sediment sources.	2012: 15 miles road improvements 2015: O'Hara Road replaced 4 culverts and improved road prism to reduce sediment delivery to stream. This was 3.5 miles of stream-adjacent road. Panel weighted accordingly (90%), and weighted for other sediment sources in area (20%: this was a major contributor, but others still exist). Still have 1-2 miles to do. NOTE: these future phases need to be included in Look Forward. Steelhead river miles from Streamnet was adjusted based on local knowledge and the panel added 4 miles to the 9.1 Streamnet miles for a total of 13.1 steelhead bearing stream miles in the Assessment Unit. Therefore, 0.63 miles of improvement over 13.1 miles of stream results in 4.8% improvement. EWL 3.8.16

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Snake River Steelhead	Selway River	SRS3	O'Hara Creek	8.1: Water Quality: Temperature	20.00%	60	60	60	65	62	70	LOC: 2. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) cites that stream temperatures in the Selway at Ohara Creek average 19.5 degrees C.	2012: Plant riparian vegetation-O'Hara Creek 2015: No actions were undertaken during the 2012-2015 timeperiod, therefore no change from Low Bookend. EWL 3.8.16
Snake River Steelhead	Selway River	SRS4	Wilderness Area (Moose Creek, Upper Selway River, etc.)	7.2: Sediment Conditions: Increased Sediment Quantity	100.00%	85	85	85	90	85	90	LOC: 3. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) describe sediment yield as 3% over base levels.	2012: No actions planned 2015: No actions were undertaken during the 2012-2015 time period, therefore no change from Low Bookend. EWL 3.8.16