

NOTES:
This workbook contains **habitat functions** data downloaded directly from the Taurus database. Functions include those documented during the **Look Forward** process covering the **2016-2018** 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% | 85.6 | 85.6 | 85.6 | 100 | 95 | 100 | Level of certainty = 2; Sources = 5, 7 | 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. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS1A | Upper Lochsa Tributaries Postoffice to Parachute Creeks | 4.1: Riparian Condition: Riparian Vegetation | 15% | 50 | 50 | 50 | | | | | 2016: No actions expected by 2018, but identified as a limiting factor during Atlas process and will be addressed in the future. |
| Snake River Steelhead | Lochsa River | LAS1A | Upper Lochsa Tributaries Postoffice to Parachute Creeks | 4.2: Riparian Condition: LWD Recruitment | 5% | 66.2 | 66.2 | 66.2 | 70 | 68 | 72 | Level of certainty = 3; Sources = 5, 6 (Due to past timber harvest) | 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. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS1A | Upper Lochsa Tributaries Postoffice to Parachute Creeks | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15% | 70 | 70 | 70 | | | | | 2016: No actions expected by 2018, but identified as a limiting factor during Atlas process and will be addressed in the future. |
| Snake River Steelhead | Lochsa River | LAS1A | Upper Lochsa Tributaries Postoffice to Parachute Creeks | 6.2: Channel Structure and Form: Instream Structural Complexity | 25% | 70.2 | 74 | 80 | 77 | 70 | 80 | Level of certainty = 4; Sources = 5, 6 | Installation of wood addressed in LF 4.2 will address this LF. 2016: Two projects will treat 27 stream miles, but treatment is not continuous along the project length and their will be varying degrees of achievement of PFC by 2018. Therefore, treated length was prorated to account for both those variables = 4.0095 stream miles effectively treated. Relative to the 41 steelhead bearing stream miles in the assessment unit, a 9.8% improvement is expected. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS1A | Upper Lochsa Tributaries Postoffice to Parachute Creeks | 7.2: Sediment Conditions: Increased Sediment Quantity | 20% | 63.5 | 63.5 | 64 | 75 | 64 | 77 | Level of certainty = 3; Sources = 5, 6 | Use LiDAR data to determine extent of existing road network. Plan to decommission roads based on that data. 2016: Expert Panel accounted for slope position, distance from stream, and growth rate of vegetation (assumed 1-2%/year) when prorating actions for this limiting factor. Four actions treated 24 stream miles, but after proration factor was applied, the realized improvements were over 0.185 stream miles. Relative to the 41 steelhead bearing stream miles in the assessment unit, the improvement will be 0.5%. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS1A | Upper Lochsa Tributaries Postoffice to Parachute Creeks | 8.1: Water Quality: Temperature | 15% | 80 | 80 | 80 | 88 | 82 | 90 | Level of certainty = 3; Sources = 1, 6 (Doesn't meet state standards, highly functional) | Benefits from Riparian actions; wood installation (LF 4.2) will indirectly impact this LF. 2016: Although there is one project in the database, it is anticipated there will be no measureable improvement by 2018. Therefore, there is no change to the low bookend. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS2A | Lower Colt Killed Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 65.6 | 65.6 | 65.6 | 100 | 66 | 100 | Level of certainty = 3; Sources = 5, 7 (Walton Creek fish weir and water intake) | Opportunity to address this LF on checkerboard/private lands. 2016: no actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS2A | Lower Colt Killed Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 80% | 55.5 | 55.5 | 55.52 | 70 | 60 | 72 | Level of certainty = 5; Sources = 6 | Opportunity to address this LF on checkerboard/private lands. LiDAR data will be use to identify projects in the future. 2016: One project treated 1.5 stream miles, but was prorated for effectiveness of action based on landscape position and distance from stream. Therefore, effective treatment stream length = 0.0075 miles. Relative to the 40.7 steelhead bearing stream miles in the assessment unit, there will be a 0.02% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS2A | Lower Colt Killed Creek | 8.1: Water Quality: Temperature | 15% | 70 | 70 | 70 | 80 | 70.5 | 82 | Level of certainty = 3; Sources = 2, 6 (Doesn't meet state standards) | Benefits from sediment projects 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS2B | Big Sand Creek | 8.1: Water Quality: Temperature | 100% | 95 | 95 | 95 | 95 | 95 | 95 | | No actions; wilderness 2016: No actions, therefore no change to low bookend. |

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|-----------------------|--------------|-------|----------------------------------|---|-----------|-------------|------------------------|-----------------------|-------------------|------------------------|-------------------|--|--|
| Snake River Steelhead | Lochsa River | LAS3A | Crooked Fork | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 65 | 65 | 66.5 | 100 | 70 | 100 | Level of certainty = 3; Sources = 5, 7 | There are currently 12 known passage barriers in this AU. 3 will be replaced in 2013. 2016: One partial barrier will be replaced. It will open 1 mile, but since it's a partial barrier was prorated 50%=0.5 stream miles effectively treated. Relative to the 33.4 steelhead bearing stream miles in the assessment unit, there will be a 1.5% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS3A | Crooked Fork | 4.1: Riparian Condition: Riparian Vegetation | 5% | 70 | 70 | 70.03 | | | | | 2016: One project treated 0.5 stream miles, and was prorated at 2% for expected growth rate = 0.01 stream miles effectively treated. Relative to the 33.4 steelhead bearing stream miles in the assessment unit, the anticipated improvement = 0.03%. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS3A | Crooked Fork | 4.2: Riparian Condition: LWD Recruitment | 30% | 50 | 50 | 50.03 | 55 | 50 | 60 | Level of certainty = 4; Sources = 5, 6 | No projects currently planned. 2016: One project treated 0.5 stream miles, and was prorated at 2% for expected growth rate = 0.01 stream miles effectively treated. Relative to the 33.4 steelhead bearing stream miles in the assessment unit, the anticipated improvement = 0.03%. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS3A | Crooked Fork | 6.2: Channel Structure and Form: Instream Structural Complexity | 35% | 45 | 45 | 45.01 | 50 | 45 | 55 | Level of certainty = 4; Sources = 5, 6 | No projects currently planned. 2016: One remeandering project, treating 0.25 stream miles was considered by Expert Panel. The stream miles treated were prorated to estimate progress toward PFC by 2018 = 1% therefore, treated stream miles = 0.0025. Relative to the 33.4 steelhead bearing stream miles in the assessment unit, the anticipated improvement = 0.01%. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS3A | Crooked Fork | 7.2: Sediment Conditions: Increased Sediment Quantity | 20% | 53.1 | 53.1 | 53.5 | 70 | 55 | 75 | Level of certainty = 3; Sources = 5, 6 | 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. 2016: Six projects treated 6.25 stream miles, but effectiveness of treatment was prorated based on landscape position and probability/risk (1-2% per year) of failures that would send sediment to streams. Thus, with proration, the realized project length = 0.11925 stream miles. Relative to the 33.4 steelhead bearing stream miles in the assessment unit, there will be a 0.4% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS3A | Crooked Fork | 8.1: Water Quality: Temperature | 5% | 50 | 50 | 50 | 55 | 51 | 57 | Level of certainty = 3; Sources = 3 (Doesn't meet state standards) | Benefits from sediment projects 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS3B | Upper Crooked Fork/Boulder Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 85 | 85 | 85 | 100 | 85 | 100 | Level of certainty = 2; Sources = 5, 7 | LiDAR data will be use to identify projects in the future. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS3B | Upper Crooked Fork/Boulder Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 95% | 70.6 | 70.6 | 70.61 | 80 | 70 | 82 | Level of certainty = 3; Sources = 6 (Mostly from natural sources (fire)) | LiDAR data will be use to identify projects in the future. Weed treatment and tree planting on decommissioned roads will address this LF. 2016: In an attempt to control invasive species,0.25 stream miles will be treated, but based on landscape position and the potential for native vegetation to recolonize by 2018 (realized improvement), stream miles treated = 0.00125 stream miles. Relative to the 19.3 steelhead bearing stream miles in the assessment unit, there will be a 0.01% improvement. EWW 7.19.16 |

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|-----------------------|--------------|------|---|--|-----------|-------------|------------------------|-----------------------|-------------------|------------------------|-------------------|--|---|
| Snake River Steelhead | Lochsa River | LAS6 | Lochsa Mainstem | 4.1: Riparian Condition: Riparian Vegetation | 40% | 85 | 85 | 85 | 87 | 85 | 90 | Level of certainty = 3; Sources = 5, 6 | 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. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS6 | Lochsa Mainstem | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 20% | 50 | 50 | 50.4 | | | | 2016: Spill concerns on highway (tanker trucks): low probability, but high risk. MgCl use in winter. | 2016: One project treating 0.3 stream miles that will achieve 95% PFC by 2018 = 0.285 stream miles effectively treated. Relative to the 71.4 steelhead bearing stream miles in the assessment unit, there will be a 0.4% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS6 | Lochsa Mainstem | 7.2: Sediment Conditions: Increased Sediment Quantity | 35% | 76.7 | 76.7 | 76.71 | 90 | 78 | 78 | Level of certainty = 3; Sources = 3, 5, 6 | benefits from actions in other assessment units 2016: Invasive species treatments across 0.5 stream miles, prorated for landscape position and ability for native vegetation to recolonize by 2018 = 0.009 stream miles effectively treated. Relative to the 71.4 steelhead bearing stream miles in the assessment unit, there will be a 0.01% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS6 | Lochsa Mainstem | 8.1: Water Quality: Temperature | 5% | 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) | Benefits from actions in other AU. This LF will also be slightly impacted by the potential placement of wood in the upper river. 2016: no actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS7 | Lower Lochsa (Deadman Creek to Pete King Creek) | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 73.4 | 73.4 | 88.7 | 100 | 73 | 100 | Level of certainty = 2; Sources = 5, 7 | 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. 2016: Removing two full barriers will open 4.5 stream miles. Relative to the 29.4 steelhead bearing stream miles in the assessment unit, there will be a 15.3% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS7 | Lower Lochsa (Deadman Creek to Pete King Creek) | 4.1: Riparian Condition: Riparian Vegetation | 20% | 70.2 | 70.2 | 70.2 | 80 | 71 | 82 | Level of certainty = 4; Sources = 3, 4, 5,6 | Accrued benefits from rd decommissioning projects 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | Lochsa River | LAS7 | Lower Lochsa (Deadman Creek to Pete King Creek) | 4.2: Riparian Condition: LWD Recruitment | 10% | 60 | 60 | 60 | | | | Based on assessment of present conditions. | 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS7 | Lower Lochsa (Deadman Creek to Pete King Creek) | 6.2: Channel Structure and Form: Instream Structural Complexity | 20% | 70 | 70 | 70.1 | 80 | 71 | 82 | Level of certainty = 3; Sources = 1,3, 4, 5, 7 | Benefits from other projects to address sediment 2016: This pilot project is very small. They hope to trap sediment, gain scour pools and willow growth in a low gradient area. Natural beaver dams blew out and there wasn't much food left for them. Prorated by 50% to reflect improvements by 2018 = 0.025 stream miles treated. Relative to the 29.4 steelhead bearing stream miles in the assessment unit, there will be a 0.1% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS7 | Lower Lochsa (Deadman Creek to Pete King Creek) | 7.2: Sediment Conditions: Increased Sediment Quantity | 35% | 52.5 | 52.5 | 55.6 | 80 | 62 | 85 | Level of certainty = 2; Sources = 2, 4, 5, 6 | 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. 2016: Two road decommissioning projects will treat 2 stream miles, prorated based on landscape position and potential realized improvement by 2018 = 0.9 stream miles. Relative to the 29.4 steelhead bearing stream miles in the assessment unit, there will be a 3.1% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS7 | Lower Lochsa (Deadman Creek to Pete King Creek) | 8.1: Water Quality: Temperature | 10% | 65 | 65 | 65 | 75 | 66 | 77 | Level of certainty = 2; Sources = 1,3, 4, 5, 6 | Benefits from sediment projects 2016: No measureable changes anticipated by 2018 |

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| Snake River Steelhead | Lochsa River | LAS8 | Middle Lochsa North Face tributaries - Weir to Tick Creeks | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 85 | 85 | 86.7 | 100 | 90 | 100 | | LiDAR will be utilized to determine extent and needs for this LF. 2016: Two stream miles treated with culvert replacement during road relocation. Prorated 50% because it's a partial barrier = 1 stream mile realized change. Relative to the 57.7 steelhead bearing stream miles in the assessment unit, there will be a 1.7% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS8 | Middle Lochsa North Face tributaries - Weir to Tick Creeks | 4.1: Riparian Condition: Riparian Vegetation | 25% | 85.2 | 85.2 | 85.21 | 92 | 87 | 95 | Level of certainty = 2; Sources = 3, 4, 5, 6 (time needed, regeneration returning from previous fires) | 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. 2016: Riparian vegetation (0.25 stream miles) will be planted in association with road relocation. Prorated (2%) to reflect vegetative growth by 2018 = 0.005. Relative to the 57.7 steelhead bearing stream miles, there will be a 0.01% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS8 | Middle Lochsa North Face tributaries - Weir to Tick Creeks | 4.2: Riparian Condition: LWD Recruitment | 5% | 80 | 80 | 80 | | | | 2016: Weighting and low bookend based on 2016 existing conditions. | 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lochsa River | LAS8 | Middle Lochsa North Face tributaries - Weir to Tick Creeks | 7.2: Sediment Conditions: Increased Sediment Quantity | 35% | 85.6 | 85.6 | 85.8 | 95 | 88 | 95 | Level of certainty = 3; Sources = 3, 4, 5 | 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. 2016: Road relocation and invasives treatment to address sediment issues. 0.5 stream miles treated, but prorated for consideration of landscape position and potential for realized improvement by 2018 = 0.10225 stream miles treated. Relative to the 57.7 steelhead bearing stream miles in the assessment unit, there will be a 0.2% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS8 | Middle Lochsa North Face tributaries - Weir to Tick Creeks | 8.1: Water Quality: Temperature | 30% | 95 | 95 | 95 | 95 | 95 | 95 | Level of certainty = 4; Sources = 3, 4 | Currently no projects planned for this LF. 2016: Parking lot improvements and toilet project will benefit water quality, but not temperature. Therefore, no change to low bookend. EWW 7.19.16 |
| Snake River Steelhead | Lochsa River | LAS9 | Middle Lochsa South Face tributaries - Lottie to Robin Creeks | 8.1: Water Quality: Temperature | 100% | 95 | 95 | 95 | 95 | 95 | 95 | Level of certainty = 4; Sources = 3, 4, 6 (Doesn't meet state standards) | Wilderness/roadless area- no projects planned for this AU. 2016: No measureable benefit from invasives project by 2018. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 4.1: Riparian Condition: Riparian Vegetation | 10% | 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 2016: No actions during look forward, therefore no change from low bookend. 2016 UPDATED after 8/2/16 Lapwai Meeting: One project will treat 0.03 stream miles and by 2018 the expected improvement will be 5% (prorated to reflect progress toward ultimate improvement) = 0.001 stream miles improved. Relative to the 54.3 steelhead bearing stream miles in the assessment unit, there will be a 0.003% improvement. EWW 9.16.16 |

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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% | 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: 2003-2006 NPT bank stability and width:depth ratio 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 2016: 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 15% | 45 | 45 | 45.05 | 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 2016: No actions during look forward, therefore no change from low bookend 2016 UPDATED after 8/2/16 Lapwai Meeting: One project will treat 0.03 stream miles and by 2018 the expected improvement will be 90% (prorated to reflect progress toward ultimate improvement) = 0.03 stream miles improved. Relative to the 54.3 steelhead bearing stream miles in the assessment unit, there will be a 0.05% improvement. EWW 9.16.16 |
| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 10% | 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, periphyton 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 2016: No actions during look forward, therefore no change from low bookend 2016 UPDATED after 8/2/16 Lapwai Meeting: One project will treat 0.03 stream miles. Landscape position prorates the effectiveness by 50% and by 2018 the expected progress improvement will be 1% (= 0.00001 stream miles improved). Relative to the 54.3 steelhead bearing stream miles in the assessment unit, there will be a 0.0003%% improvement. This small of an improvement is not recordable in Taurus. EWW 9.16.16 |

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| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 8.1: Water Quality: Temperature | 25% | 30 | 30 | 30 | 40 | 30 | 55 | Level of Certainty = 2. Instantaneous max in excess of 26Â°C recorded at multiple locations; 28.8Â°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 <14Â°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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 8.7: Water Quality: Toxic Contaminants | 2% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 9.1: Water Quantity: Increased Water Quantity | 8% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS1 | Big Canyon Creek | 9.2: Water Quantity: Decreased Water Quantity | 20% | 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 |

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|-----------------------|---------------------------------|------|---------------------------|---|-----------|-------------|------------------------|-----------------------|-------------------|------------------------|-------------------|--|---|
| Snake River Steelhead | Clearwater River lower mainstem | LCS2 | Camas Prairie tributaries | 4.1: Riparian Condition: Riparian Vegetation | 15% | 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 community composition. EXTANT DATA: 2008-2011 NPT photos and canopy cover dataRiparian 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS2 | Camas Prairie tributaries | 6.1: Channel Structure and Form: Bed and Channel Form | 10% | 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 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS2 | Camas Prairie tributaries | 6.2: Channel Structure and Form: Instream Structural Complexity | 10% | 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 2016: No actions during look forward, therefore no change from low bookend |

| 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% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS2 | Camas Prairie tributaries | 8.1: Water Quality: Temperature | 35% | 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 <14Â°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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS2 | Camas Prairie tributaries | 9.1: Water Quantity: Increased Water Quantity | 5% | 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 2016: No actions during look forward, therefore no change from low bookend |

| 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 |
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| Snake River Steelhead | Clearwater River lower mainstem | LCS2 | Camas Prairie tributaries | 9.2: Water Quantity: Decreased Water Quantity | 15% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS3 | Clearwater Mountain tributaries | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS3 | Clearwater Mountain tributaries | 4.1: Riparian Condition: Riparian Vegetation | 10% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS3 | Clearwater Mountain tributaries | 6.1: Channel Structure and Form: Bed and Channel Form | 15% | 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 2016: No actions during look forward, therefore no change from low bookend |

| 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% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS3 | Clearwater Mountain tributaries | 7.2: Sediment Conditions: Increased Sediment Quantity | 15% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS3 | Clearwater Mountain tributaries | 8.1: Water Quality: Temperature | 15% | 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 <14Â°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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS3 | Clearwater Mountain tributaries | 9.1: Water Quantity: Increased Water Quantity | 10% | 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 2016: No actions during look forward, therefore no change from low bookend |

| 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% | 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 2016: No actions during look forward, therefore no change from low bookend |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 60 | 60 | 71.3 | 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 | Mission Creek Bridge Replacement #15-1586 ("184. Install Fish Habitat Structure" should read barrier removal: 11 miles of upstream habitat; was a seasonal partial barrier with debris blockage issues depending on county clean-out timing actions - often blocked during critical migration season, so 50% proration) included. No credit assigned (0% proration) to Flat Iron Bridge Replacement #12-157 ("29. Increase Instream Habitat Complexity and Stabilization": 7 miles of upstream habitat, 4 foot drop, SRBA 2017 project not in database) because there is also a downstream barrier that needs to be addressed before this one helps. East Fork Sweetwater Culvert Replacement 2017 is also above the other barrier, and is slated for 2019 or 2020. New uplift (including previous Look Forward sessions) = 11.3%. EWW 9.16.16 |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 4.1: Riparian Condition: Riparian Vegetation | 15% | 36.4 | 36.4 | 36.6 | 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 affect LF 6.1, 6.2, 7.2, and 8.1. High bookend changed from 40 to 55 (2018) and 60 to 65 (2033) per NPT CLW_Lapwai_expert panel edits_Oct2012.xlsx. spreadsheet. | Comments entered 7/18/16 and updated after 8/2/16 Lapwai meeting on 9/16/16 EWW. See calculation table. Added Mission Creek Bridge Stream bank Enhancement; 5% proration = 0% uplift due to rounding. Sweetwater Exclusion Fence will benefit springs and Webb Creek, no plantings, but natural regeneration for 800 ft. Site 11-128 water developments expected completion 2016. Project provides off channel water for livestock, protection 600 ft of Mission Creek; regeneration of mature plants; 5% proration. South Tom Beall Buffer Project Phase V expected completion 2016. Planting project along 1.25 miles of stream to establish a 150 ft buffer; currently no shade or woody veg; 5% proration. Install fence at Site 16-1847 expected completion 2016.Fence installed along Sweetwater Creek along 1000 ft.(5% proration). Expected completion 2018. Fence installation along 300 ft of Sweetwater Creek for spring protection Fors 0.02 miles downstream of Sweetwater fence expected completion 2017. Fence installed along Sweetwater Creek." Water Development Fors, Windmill Road Phase I expected completion 2018. Planting project along 600 feet of stream (5% proration). Tom Beall Reconnect Phase II expected completion 2016. Planting project along 300 feet of stream both banks planted (5% proration). Tom Beall Reconnect Phase I expected completion 2016. Planting along 300 ft of stream.New uplift = 0.2%. |

| 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 |
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| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15% | 29 | 29 | 32.9 | | | | Approximately 21 out of 75 miles have no side channels. | 2016: Two projects will treat 1 stream miles, but prorated to account for achieving PFC by 2018 = 0.825 stream miles. Relative to 21 steelhead bearing mainstem miles, there will be a 3.9% improvement. EWW 7/18/16 |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 6.1: Channel Structure and Form: Bed and Channel Form | 5% | 51.1 | 55 | 55 | 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. | Comments entered 7/18/16 and updated after 8/2/16 with L. Rasmussen 9/16/16 EWW. Mission Creek bridge replacement will pass more bed material, but bed and channel form is a secondary minor localized benefit. Flat Iron Bridge replacement will benefits other limiting factors. Webb Creek Floodplain project will relocate road out of the floodplain to restore channel meanders. Because there are not direct changes to the channel be constructed benefits were weighted at 0%.Sweetwater Creek sediment reduction near the Flat Iron project will benefit sediment and was not included in benefits to this limiting factor. New uplift 3.9%. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 6.2: Channel Structure and Form: Instream Structural Complexity | 10% | 40.3 | 40.3 | 41.9 | 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 | Comments entered 7/18/16 and updated after 8/2/16 Lapwai meeting on 9/16/16 EWW. Group discussed time frame which benefits would accrue and did not include the fence projects, plantings, or water developments. Mission Creek bank protection expected completion 2018. Log revetment and toe rock placement to create pools in 0.05 miles with 75% proration. New uplift = 1.6%. |

| 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 | 7.2: Sediment Conditions: Increased Sediment Quantity | 5% | 42.1 | 42.1 | 45.6 | 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, periphyton and macroinvertebrate data. | Comments entered 7/18/16 and updated 8/2/16 Lapwai meeting on 9/16/16 EWW. Mission Creek Bridge replacement will eliminate fine sediment erosion to creek. See calculation tables for sediment reduction projects. Proration based on landscape position and potential benefit in project area. Sweetwater exclusion mid-slope water development and fencing. Webb Creek enhancement. Flat Iron Bridge replacement will eliminate erosion along 400 ft of stream. Road erosion reduction will partially treat incoming sediments. Webb Creek floodplain road will treat 2,300 ft. Benefits prorated based on road slope position. Sweetwater Creek sediment reduction (two segments) will treat 800 and 200 ft of old logging road near Mill Creek with water bars and other BMPs. Numerous other roads in the area so benefits were prorated lower. Sweetwater drainage no-till conservation expected completion 2016. Project expected to reduce erosion and water surface runoff (anticipated to reduce erosion 5 tons/ac of sediment) from treatment of 90% of acreage. 1.5 miles adjacent to creek. Sweetwater drainage no-till projects planned between 2015 and 2018. South Tom Beall buffer project Phase V will treat 1.25 mi. Mission Creek bank protection project benefits prorated at 90%. Windmill mostly channel erosion, so small/no measurable benefit from plantings. Gully Erosion treatments are considered to be 75-80% effective in reducing erosion (in Sweetwater Cr drainage), will affect 300 ft. of creek, but other sediment sources exist from land use. Revised uplift 3.5%. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 8.1: Water Quality: Temperature | 15% | 30.4 | 35 | 48.25 | 45 | 38 | 55 | Level of Certainty = 1. Instantaneous max in excess of 26Â°C recorded at multiple locations; 31.8Â°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 <14Â°C. EXTANT DATA: 2003-2005 NPT thermograph data; BOR thermograph data | Benefits from 3.25 miles of riparian restoration, in addition to benefits from influence on hyporheic flow from NPT trust unit 40 stream restoraion and 4 major levee systems to be addressed. Vegetation growth response within 2018 period not expected to yield measurable benefits to temperature. These projects accounted for already under different limiting factors. Recognizing that temperature improvements can come from both shading and flow increases, the expert panel calculated temperature improvements through the additive uplifts from both vegetation improvement projects = 0.05% and flow improvements from limiting factor 9.2 = 17.8%. Therefore, a 17.85% improvement is expected. EWW 7/18/16 |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 8.7: Water Quality: Toxic Contaminants | 2% | 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. | No projects planned 2016: No actions, therefore no change to low bookend. |

| 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% | 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 | No actions no change. Comments entered 9/26/16 RM. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS4 | Lapwai Creek Basin | 9.2: Water Quantity: Decreased Water Quantity | 15% | 35 | 38 | 52.8 | 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 | Comments entered 7/9/16 and updated 9/16/16 EWW. LOP pilot well project will add 4 cfs, over 22 stream miles, but flows and needs are seasonal. The annual average flow affected = 2.7 cfs over historical baseflow of 15 cfs = 17.8% improvement. EWW 7.18.16 Lapwai Reforestation (expected completion 2016) will convert 30 ac of cropland to forestlands, is anticipated to improve upland hydrology. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 71 | 75 | 89.1 | 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." | In 2016 the expert panel evaluated three projects anticipated to improve 59 stream miles. When prorated to account for full or partial barriers, improvement was considered over 32.5 stream miles. Relative to the 179.5 steelhead bearing stream miles in the assessment unit, 18.1% improvement is anticipated. Comments entered 7/18/16 EWW. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 4.1: Riparian Condition: Riparian Vegetation | 10% | 50.7 | 50.7 | 50.9 | 55 | 65 | 65 | A large portion of the diminished riparian cooridors are located within the basin where agricluture has been active and continues to be active as well as areas of active livestock grazing. The riparian conditions in these area will be enhanced through livestock exclusion, riparian plantings with native species, and the implementation of upland agriclutural practices that reduce sheet and gully erosion. These efforts will also affect 6.1, 6.2, 7.2, and 8.1. | In 2016 the expert panel evaluated five riparian vegetation projects treating 5.21 stream miles that are anticipated for completion by 2018. Because vegetation takes time to grow up, projects were prorated based on their anticipated realized improvement by 2018. Therefore 0.3125 stream miles relative to the 179.5 steelhead bearing stream miles in the assessment unit were credited for improvement of 0.2%Comments entered 7/18/16 EWW. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15% | 30 | 30 | 33.3 | | | | Much incision throughout assessment unit. | In 2016 five projects were prorated based on anticipated progress toward PFC by 2018 along 2.9325 stream miles. Relative to the 90 stream miles with less than 2% slope in the assessment unit (the expert panel recognizes that not all reaches will have floodplains due to different geomorphology/confinement), there will be a 3.3% improvement. Comment entered 7/18/16 EWW. |

| 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% | 47.1 | 47.1 | 50.6 | 55 | 60 | 60 | Channel structure and stability will be enhanced in the agricluture 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. | In 2016 the expert panel evaluated treatments to 5.46 stream miles total from meadow restoration projects. Based on anticipated improvements by 2018 3.1475 stream mi relative to 90 mi of steelhead bearing streams were expected to improve < 2% of the assessment unit. The expert panel recognizes that not all reaches will have floodplains due to different geomorphology/confinement, so estimated a 3.5% uplift. Comments entered 7/18/16 EWW. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 6.2: Channel Structure and Form: Instream Structural Complexity | 10% | 41.7 | 41.7 | 43.5 | 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 | In 2016 the expert panel evaluated treatments to 5.46 stream miles total from meadow restoration projects. Based on anticipated improvements by 2018 3.1475 stream mi relative to 90 mi of steelhead bearing streams were expected to improve < 2% of the assessment unit. The expert panel recognizes that not all reaches will have floodplains due to different geomorphology/confinement, so estimated a 1.8% uplift. Comments entered 7/18/16 EWW. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 7.2: Sediment Conditions: Increased Sediment Quantity | 10% | 41 | 41 | 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. | No actions no change. Comments entered 9/26/2016 RM. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 8.1: Water Quality: Temperature | 15% | 30 | 30 | 34.4 | 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. | Comments entered 7/16/16 EWW and updated 9/26/16 RM. Panel noted that dissolved oxygen is a factor in this assessment unit, but considered it within limiting factor 8.1 and limiting factor 9.2 and noted that dissolved oxygen is improved by actions that benefit flow and temperature. Sum of riparian and flow uplifts results in 4.4% uplift that was recorded for this limiting factor. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS5 | Potlatch River Basin | 9.2: Water Quantity: Decreased Water Quantity | 20% | 30 | 30 | 34.2 | 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. | Comments entered 7/18/16 EWW and edited 9/26/16 RM. Panel noted that dissolved oxygen is a factor in this assessment unit, but considered it within limiting factors 8.1 and 9.2 and noted that dissolved oxygen is improved by actions that benefit flow and temperature. Spring Valley Reservoir flow augmentation will supplement low flows by 0.25 cfs, affecting 12 mi, 7 that currently go dry. Mainstem Potlatch baseflow in August is 6 cfs. Using this as a denominator results in 4.2% uplift. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6A | Weippe Prairie | 4.1: Riparian Condition: Riparian Vegetation | 15% | 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 2016: No actions, therefore no change to low bookend. |

| 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% | 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 and wetted width/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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6A | Weippe Prairie | 6.2: Channel Structure and Form: Instream Structural Complexity | 10% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6A | Weippe Prairie | 7.2: Sediment Conditions: Increased Sediment Quantity | 15% | 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 count 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 2016: No actions, therefore no change to low bookend. |

| 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% | 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 <14Â°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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6A | Weippe Prairie | 9.1: Water Quantity: Increased Water Quantity | 5% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6A | Weippe Prairie | 9.2: Water Quantity: Decreased Water Quantity | 25% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6B | Lower canyon tributaries | 1.1: Habitat Quantity: Anthropogenic Barriers | 2% | 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 2016: No actions, therefore no change to low bookend. |

| 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% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6B | Lower canyon tributaries | 6.1: Channel Structure and Form: Bed and Channel Form | 10% | 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 and wetted width/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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6B | Lower canyon tributaries | 6.2: Channel Structure and Form: Instream Structural Complexity | 15% | 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% | 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 count 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6B | Lower canyon tributaries | 8.1: Water Quality: Temperature | 20% | 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 <14Â°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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6B | Lower canyon tributaries | 9.1: Water Quantity: Increased Water Quantity | 8% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Clearwater River lower mainstem | LCS6B | Lower canyon tributaries | 9.2: Water Quantity: Decreased Water Quantity | 25% | 30 | 30 | 30 | 35 | 30 | 45 | Level of Certainty = 3. Low baseflow levels present within all streams, intermittant 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 2016: No actions, therefore no change to low bookend. |

| 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 | LOS1 | Eldorado Creek | 1.2: Habitat Quantity: Natural Barriers | 0% | 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 2016: no actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS1 | Eldorado Creek | 4.1: Riparian Condition: Riparian Vegetation | 50% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS1 | Eldorado Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 50% | 60 | 65 | 65 | 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 2016: One road decommission project would affect 1 stream miles, but prorated by landscape position and realized benefits to 2018 results in a 0.05 stream miles effectively treated. Relative to the 1 steelhead bearing stream miles in the assessment unit, there will be a 5% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lolo Creek | LOS2 | Jim Brown Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 15% | 80.7 | 80.7 | 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 seen during construction salvage. Therefore 3.75/35.1*100 = a 10.7% improvement. EWL 3.10.16 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS2 | Jim Brown Creek | 4.1: Riparian Condition: Riparian Vegetation | 15% | 40.1 | 40.1 | 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 2016: No actions, therefore no change to low bookend. |

| 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 | 7.2: Sediment Conditions: Increased Sediment Quantity | 25% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS2 | Jim Brown Creek | 8.1: Water Quality: Temperature | 30% | 40.1 | 40.1 | 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 16Â°C daily average and the instantaneous maximum of 20Â°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*100= 0.1 % improvement to this limiting factor. EWL 3.10.16 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS2 | Jim Brown Creek | 8.2: Water Quality: Oxygen | 15% | 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 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS3A | Lower Lolo Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 86.1 | 86.1 | 86.1 | 90 | 86 | 90 | NPT Culvert Assessment (2010) identified 19 culverts in this watershed which are identified as fish passage barriers. 2016: Revised Assessment Unit (AU) boundary, AU code, and AU name | Molly Creek to return 3 miles of stream habitat 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS3A | Lower Lolo Creek | 4.1: Riparian Condition: Riparian Vegetation | 40% | 60.1 | 60.1 | 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 2016: Revised Assessment Unit (AU) boundary, AU code, and AU name | Colette Mine Stream Restoration will restore approximately 5 miles of stream habitat, recontour, and reconnect the flood plain and wetlands 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS3A | Lower Lolo Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 10% | 70.5 | 70.5 | 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). 2016: Revised Assessment Unit (AU) boundary, AU code, and AU name | Colette Mine Stream Restoration will restore approximately 5 miles of stream habitat, recontour, and reconnect the flood plain and wetlands 2016: No actions, therefore no change to lowbookend. |

| 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 | LOS3A | Lower Lolo Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 40% | 71.7 | 71.7 | 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. 2016: Revised Assessment Unit (AU) boundary, AU code, and AU name | 35 miles of road decommissioning through Lolo insect and disease EIS 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS4 | Musselshell Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 25% | 56.7 | 56.7 | 56.7 | 90 | 75 | 90 | Clearwater Subbasin Plan, NOAA Recovery Plan | 14.4 miles of stream access to be restored 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS4 | Musselshell Creek | 4.1: Riparian Condition: Riparian Vegetation | 25% | 60.4 | 60.4 | 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 | 4 miles of stream and wetland plantings at Deer Gulch. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS4 | Musselshell Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 25% | 41.6 | 41.6 | 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. | 15 miles s of road decommissioning and improvement in Lolo Insect and Disease 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS4 | Musselshell Creek | 8.1: Water Quality: Temperature | 25% | 50.4 | 50.4 | 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 | From approximately 4 miles of stream and wetland planting at Deer Gulch. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS6 | Upper Lolo Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 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). 2016: New downstream boundary of LOS5 is confluence of Lolo and Jim Brown creeks. Renamed as "Upper Lolo Creek" = LOS6. Updated assessment unit weights: moved old LOS3 weight to new LOS6 + 10% (= 40%. Low bookend updated by panel based on percentage of properly functioning condition. EWW 7.19.16 | No actions planned. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | Lolo Creek | LOS6 | Upper Lolo Creek | 4.1: Riparian Condition: Riparian Vegetation | 20% | 60 | 60 | 60.2 | 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). 2016: New downstream boundary of LOS5 is confluence of Lolo and Jim Brown creeks. Renamed as "Upper Lolo Creek" = LOS6. Updated assessment unit weights: moved old LOS3 weight to new LOS6 + 10% (= 40%. Low bookend updated by panel based on percentage of properly functioning condition. EWW 7.19.16 | No actions planned. 2016: Riparian enhancement project will treat 0.5 stream miles. Prorated 10% to account for time it takes for vegetation to grow = 0.05 stream miles effectively treated. Relative to the 23.7 steelhead bearing stream miles in the assessment unit, there will be a 0.2% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lolo Creek | LOS6 | Upper Lolo Creek | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 10% | 70 | 70 | 71.9 | | | | 2016: New downstream boundary of LOS5 is confluence of Lolo and Jim Brown creeks. Renamed as "Upper Lolo Creek" = LOS6. Updated assessment unit weights: moved old LOS3 weight to new LOS6 + 10% (= 40%. Low bookend updated by panel based on percentage of properly functioning condition. EWW 7.19.16 | 2016: Berm removal at Collette mine will open 90% of floodplain upstream. Prorated 90% to reflect progress toward PFC by 2018, the effective treatment is 0.45 stream miles. Relative to the 23.7 steelhead bearing stream miles in the assessment unit, there will be a 1.9% improvement. EWW 7.19.16 |

| 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 |
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| Snake River Steelhead | Lolo Creek | LOS6 | Upper Lolo Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 20% | 70 | 70 | 71.9 | | | | 2016: New downstream boundary of LOS5 is confluence of Lolo and Jim Brown creeks. Renamed as "Upper Lolo Creek" = LOS6. Updated assessment unit weights: moved old LOS3 weight to new LOS6 + 10% (= 40%. Low bookend updated by panel based on percentage of properly functioning condition. EWW 7.19.16 | 2016: Berm removal at Collette mine will open 90% of floodplain upstream. Prorated 90% to reflect progress toward PFC by 2018, the effective treatment is 0.45 stream miles. Relative to the 23.7 steelhead bearing stream miles in the assessment unit, there will be a 1.9% improvement. EWW 7.19.16 |
| Snake River Steelhead | Lolo Creek | LOS6 | Upper Lolo Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 40% | 55 | 55 | 59.6 | 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. 2016: New downstream boundary of LOS5 is confluence of Lolo and Jim Brown creeks. Renamed as "Upper Lolo Creek" = LOS6. Updated assessment unit weights: moved old LOS3 weight to new LOS6 + 10% (= 40%. Low bookend updated by panel based on percentage of properly functioning condition. EWW 7.19.16 | Lolo insect and Disease EIS, approximately 20 miles of road decommissioning planned 2016: Road decommissioning will treat 22 stream miles, but prorated 50% because it is midslope road and another 10% to reflect progress toward sediment reduction by 2018. Therefore total effective treatment area = 1.1 stream miles. Relative to 23.7 steelhead bearing stream miles in the assessment unit, there will be 4.6% improvement. EWW 7.19.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 100 | 100 | 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. | 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. 2016:One project treated 10 stream miles and was prorated 50% because it is a partial barrier to steelhead adults and juveniles at high flows due to velocity. There are no other barriers upstream. Therefore 5 stream miles improved relative to 93 steelhead bearing stream miles in the assessment unit = 5.4%. However, the low bookend is already 100%, so this improvement cannot be accounted for in the look forward. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 4.1: Riparian Condition: Riparian Vegetation | 20% | 35 | 35 | 35.05 | 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% | Approximently 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. 2016: One project treated 0.25 stream miles, but was prorated 20% to reflect the realized improvement through 2018 = 0.05. Relative to the 93 steelhead bearing stream miles in the assessment unit, this project resulted in a 0.05% improvement. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 4.2: Riparian Condition: LWD Recruitment | 10% | 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. | Planting along American River will provide LWD recruitment in the long term. 2016: No actions, no change to low bookend |

| 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 |
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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% | 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. | No side channels or wetlands will be constructed or improved in this watershed by 2018. Projects are being explored for beyond 2018. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15% | 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. | No floodplain or side channel work will be done by 2018. Projects are being explored for beyond 2018. 2016: No actions, therefore, no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 6.2: Channel Structure and Form: Instream Structural Complexity | 15% | 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. | No instream work will be done in the American River watershed by 2018. Projects are being explored for beyond 2018. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 7.2: Sediment Conditions: Increased Sediment Quantity | 15% | 40.1 | 40.1 | 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. | 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. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS1 | American River | 8.1: Water Quality: Temperature | 5% | 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 likely to improve temperature conditions in the watershed. | Benefits from riparian planting actions. 2016: One project could address the water temperature issue, but there is not enough time between when the project was implemented and the end of the reporting period (2018) to realize any improvement. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 80 | 80 | 80.6 | 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 known barriers to streams with rearing habitat. Target= 100% fish passage. | Replacing 2 culverts in Crooked River by 2018. 2016: One project treated 0.5 stream miles, but was prorated 50% because it is a partial barrier = 0.25 stream miles treated. Relative to the 44 steelhead bearing stream miles across the assessment unit, there will be a 0.6% improvement. EWW 7.11.16 |

| 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 |
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| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 4.1: Riparian Condition: Riparian Vegetation | 20% | 25.3 | 25.3 | 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. | 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. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 4.2: Riparian Condition: LWD Recruitment | 5% | 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. | 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. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 10% | 35 | 35 | 35.6 | 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. | 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. 2016: One project (2 phases) will be completed by 2018, but there will be no realized improvement during the look forward period (until the channel is rewatered). EWW 7.11.16 7.20.16: An update by NPT: One additional project will treat 0.5 stream miles and will achieve 50% improvement toward PFC by 2018 = 0.25 side channel miles effectively treated (regarding 11 acres of which 6 will be wetland by 2018). Relative to the 44 side channel miles in the assessment unit, there will be a 0.6% improvement. EWW 9.1.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 20% | 35 | 35 | 38.3 | 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. | 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. 2016: One project (2 phases) will be completed by 2018, but there will be no realized improvement until the channel is rewatered after the look forward period. EWW 7.11.16 7.20.16: An update by NPT: One additional project will treat 0.5 stream miles and will achieve 80% improvement toward PFC by 2018 = 0.4 stream miles effectively treated (regarding 11 acres of which 6 will be wetland by 2018). Relative to the 12 steelhead bearing stream miles in the assessment unit, there will be a 3.3% improvement. EWW 9.1.16 |

| 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 |
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| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 6.2: Channel Structure and Form: Instream Structural Complexity | 25% | 40 | 40 | 40.9 | 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. | Design criteria from 2012 field season show an increace of approximately 1 mile of new stream channel and approx. 4 miles of improved instream structural complexity. 2016: No actions, therefore no change to low bookend 7.20.16: One project was added, which will add 10 large woody debris structures along 0.5 miles of river. The streambed will not be excavated and pools will form naturally, therefore the project was prorated to 80% to reflect progress toward PFC by 2018 = 0.4 stream miles improved. Relative to the 44 steelhead bearing stream miles in the assessment unit, there will be a 0.9% improvement. EWW 9.12.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 7.2: Sediment Conditions: Increased Sediment Quantity | 10% | 60.5 | 60.5 | 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 denisty 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. | 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. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS2 | Crooked River | 8.1: Water Quality: Temperature | 5% | 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 likley to improve temperature conditions in the watershed. | Improvements from the Meanders project. Restoring the floodplain will provide better groundwater connection and reducing the amount of exposed suface water in the ponds will reduce overall stream temperatures in the lower Crooked River. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS3 | John's Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 20% | 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 priotitize 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% 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS3 | John's Creek | 4.1: Riparian Condition: Riparian Vegetation | 40% | 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 | Slight additional benefit from road decommissioning reducing impacts to riparian zone. No additional activities planned for 2013-2018. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS3 | John's Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 40% | 80 | 80 | 80 | 85 | 84 | 90 | LOC: 4 Goal for cobble embeddedness is less than 30%; occular 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. | 5 miles decommissioning in the roaded portion planned for 2013-2018. 2016: No actions, therefore no change to low bookend |

| 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 |
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| Snake River Steelhead | South Fork Clearwater River | SCS4 | Meadow Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 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 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS4 | Meadow Creek | 4.1: Riparian Condition: Riparian Vegetation | 15% | 61.1 | 61.1 | 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 lengths of known steelhead distribution, resulting in 21 stream miles total for the Assessment Unit. Therefore 0.225/21*100 = 1.1% improvement. EWL 3.8.16 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS4 | Meadow Creek | 4.2: Riparian Condition: LWD Recruitment | 15% | 65 | 65 | 65 | 70 | 65 | 75 | LOC: 4. Lack of recuitment 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 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS4 | Meadow Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 45% | 50.7 | 50.7 | 50.7 | 70 | 60 | 75 | LOC: 4 Goal for cobble embeddedness is less than 30%; ocular 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*100 = 0.7% improvement over low bookend. EWL 3.9.16. 2016: No actions, therefore no change to low bookend |

| 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 |
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| Snake River Steelhead | South Fork Clearwater River | SCS4 | Meadow Creek | 8.1: Water Quality: Temperature | 15% | 66.1 | 66.1 | 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. Streamnet steelhead distribution is 15 miles and includes mainstem and not North Meadow. The Expert Panel added 6.0 miles of additional tributary lengths of known steelhead distribution, resulting in 21 stream miles total for the Assessment Unit. Therefore 0.225/21*100 = 1.1% improvement. EWL 3.8.16 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS5 | Mill Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 15% | 91.9 | 91.9 | 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. | 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% 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS5 | Mill Creek | 4.1: Riparian Condition: Riparian Vegetation | 30% | 60.1 | 60.1 | 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. | 1.0 miles riparian planting planned for 2013-2018. Additional benefit from road decommissioning reducing access to riparian zone. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS5 | Mill Creek | 4.2: Riparian Condition: LWD Recruitment | 20% | 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. | 1.0 miles riparian planting planned for 2013-2018. Riparian planting will not provide LWD recruitment until the long term (75 plus years). 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS5 | Mill Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 20% | 60 | 60 | 64.5 | 75 | 73 | 80 | LOC: 4 Goal for cobble embeddedness is less than 30%; ocular 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. 2016: Revised the low bookend from 71 to 60 during 2016 EP LF. MAH6.7.16 | 10 miles decommissioning planned for 2013-2018. Additional benefit from 1.0 miles riparian planting planned for 2013-2018. 2016: One project treated 2.3 stream miles (5 road miles), but was prorated (90% & 50%) based on position on landscape and total benefit possible in the watershed = 1.035 realized treatment stream miles. Relative to the 22.8 steelhead bearing stream miles in the assessment unit, there will be a 4.5% improvement. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS5 | Mill Creek | 8.1: Water Quality: Temperature | 15% | 70.1 | 70.1 | 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. | 1.0 miles riparian planting planned for 2013-2018. Recent trends show 10-15 days exceedence. 2016: No actions, therefore no change to low bookend |

| 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 | SCS6 | Misc Clearwater Tribs | 1.1: Habitat Quantity: Anthropogenic Barriers | 25% | 40 | 40 | 69.4 | 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 priotitize actions. Reassigned LF based on review of watershed conditions and goals. 2016:Expert Panel decided that low bookend was too high given current knowledge of what needs to be replaced = 40% | 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% 2016: Three project that will treat 18.8 stream miles were prorated to 6.7 stream miles based on if they are partial or full barriers or the quality of the habitat above the barrier. Relative to the 22.8 steelhead bearing stream miles in the assessment unit, there will be a 29.4% improvement. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS6 | Misc Clearwater Tribs | 4.1: Riparian Condition: Riparian Vegetation | 20% | 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. | No actions planned for 2013-2018 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS6 | Misc Clearwater Tribs | 6.2: Channel Structure and Form: Instream Structural Complexity | 10% | 80 | 80 | 80.7 | 90 | | | 2016: Low and high bookend revised when LF added. | 2016: One historic mining project treated 0.33 stream miles and was prorated 50% to reflect realized improvements by 2018 = 0.165 stream miles. Relative to the 22.8 steelhead bearing stream miles in the assessment unit, the anticipated improvement = 0.7%. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS6 | Misc Clearwater Tribs | 7.2: Sediment Conditions: Increased Sediment Quantity | 30% | 57.9 | 57.9 | 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. | 30 miles decommissioning in the roaded portion planned for 2013-2018. Additional benefits 5.1 miles road improvement planned for Leggett and Peasley Creeks 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS6 | Misc Clearwater Tribs | 8.1: Water Quality: Temperature | 15% | 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. | No actions planned for 2013-2018 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 5% | 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. | Identified high priority culverts for fish passage replaced already. No actions planned, but more may be found upon further investigation. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 4.1: Riparian Condition: Riparian Vegetation | 10% | 47 | 47 | 47.2 | 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) | All stream and floodplain restoration to be planted by 2018. 2016: One project treated 1.95 stream miles, but was prorated 5% to account for potential improvement to 2018 = 0.0975 stream miles. Relative to the 51.1 steelhead bearing stream miles in the assessment unit, the anticipated improvement = 0.2%. EWW 7.11.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 4.2: Riparian Condition: LWD Recruitment | 10% | 40.2 | 40.2 | 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 strea miles) | 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). 2016: One project treated 1.95 stream miles but was prorated 0 because there is not enough time to realize any improvement by 2018. EWW 7.11.16 |

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|-----------------------|-----------------------------|------|-----------------|--|-----------|-------------|------------------------|-----------------------|-------------------|------------------------|-------------------|--|---|
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 15% | 30 | 30 | 41.4 | | | | Not many functioning side channels remain in this assessment unit. | 2016: New Limiting factor added during 2016 Look Forward. 1.95 stream miles treated, but prorated 70% to reflect realized improvements to 2018. Therefore, 1.365 stream miles treated across 12 steelhead bearing stream mainstem miles yields 11.4% improvement. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15% | 60.8 | 60.8 | 60.8 | 55 | 57 | 65 | LOC: 3. Newsome EAWS recommends restoration of areas impacted by dredge mining (approx 8 miles) | Reach 2 will be implemented over a 2-3 year period to maximize floodplain connectivity. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 30% | 42.3 | 42.3 | 54.5 | 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) | 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. 2016: One project will treat 1.95 stream miles, but by 2018, 75% improvement will be realized = 1.4625 stream miles. Relative to 12 mainstem miles in the assessment unit, the project results in a 12.2% improvement. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 10% | 42.2 | 42.2 | 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 | Approx. 168 miles of roads covered under NEPA. Road improvement and decommissioning will take several years to complete. 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS7 | Newsome Creek | 8.1: Water Quality: Temperature | 5% | 61.2 | 61.2 | 61.5 | 65 | 65 | 70 | LOC: 3. Newsome Watershed Assessment (EAWS) cites dredge mining and reduced vegetation cover as major contributors to increased stream temps. | Benefits from vegetation planting and channel work. Hyporheic flow 2016: One project treated 1.95 stream miles, but the hyporheic benefits will be realized slightly by 2018 = 8%. Therefore, total improved stream miles = 0.14625 relative to the 51.1 steelhead bearing stream miles in the assessment unit. Yielding an improvement of 0.3%. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 1.1: Habitat Quantity: Anthropogenic Barriers | 10% | 64.8 | 65 | 67.5 | 80 | 65 | 80 | LOC: 2. 200 stream/road crossings. 40 are passage barriers. | Six crossings currently indentified and prioritized for design and replacement. Additional culverts will be addressed in outyears (beyond 2018). 2016: One project replaced 2 culverts, which were full barriers, but opened 5 miles of high gradient habitat. Assuming high gradient reduces the value of the habitat, the Expert Panel prorated the improved stream miles by 50% = 2.5 stream miles. Relative to the 94.1 steelhead bearing stream miles in the assessment unit, the project resulted in a 2.7% improvement. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 4.1: Riparian Condition: Riparian Vegetation | 25% | 51.1 | 51.1 | 51.5 | 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 | 36-48 streambank (one side of river) miles total to be planted. Estimate does not include future potential conservationn easements or land purchases. 2016: Two projects treated 3.5 miles, but prorated to reflect vegetative growth to 2018 = 0.3875 stream miles. Relative to the 94.1 steelhead bearing stream miles in the assessment unit, there will be a 0.4% improvement. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 4.2: Riparian Condition: LWD Recruitment | 5% | 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. | 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. 2016: No actions, therefore no change to low bookend. |

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| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 5% | 65 | 65 | 66.7 | 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. | Benefits estimated include channel restoration. This reflects a combination of multiple WEs. 2016: One project will remove floodplain berms to reconnect floodplain and reactivate meanders for 2.25 miles, but will project benefits will be realized at 70% of PFC by 2018 (1.575 stream miles). Therefore, relative to the 94.1 steelhead bearing stream miles in the assessment unit, there will be a 1.7% improvement. |
| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 6.2: Channel Structure and Form: Instream Structural Complexity | 20% | 40 | 40 | 42.2 | 60 | 47 | 70 | LOC: 2. Red River Narrows project area key area for restoration (2 miles). Meadows also simplified habitat (approx. 12 miles) | Estimate is a combination of multiple WEs. Meadows will not have LWD structures placed, will focus on floodplain connectivity and revegetation. 2016: One project will excavate deep pools and increase sinuosity. By 2018, it is anticipated improvements will yield 90% improvement to PFC. = 2.025 stream miles. Therefore, across the 94.1 steelhead bearing stream miles in the assessment unit, there will be a 2.2% improvement. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 7.2: Sediment Conditions: Increased Sediment Quantity | 20% | 58.3 | 58.3 | 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. | 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. 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS8 | Red River | 8.1: Water Quality: Temperature | 15% | 40 | 40 | 40.2 | 60 | 55 | 70 | LOC: 2. RR EAWS - temps commonly exceeded in mainstem RR, streamside shading reduced. | Benefits from stream & floodplain restoration (hyphorheic flow) as well as riparian planting work. 2016:Planting projects treated 3.25 stream miles were prorated to reflect realized improvement of temperature by 2018, which is dependent on vegetative growth = 0.18 stream miles. Relative to the 94.1 steelhead bearing stream miles across the assessment unit, there will be a 0.2% improvement. EWW 7.18.16 |
| Snake River Steelhead | South Fork Clearwater River | SCS9 | South Fork Clearwater Mainstem | 6.2: Channel Structure and Form: Instream Structural Complexity | 20% | 60 | 60 | 60 | 70 | 60 | 75 | | 2016: No actions, therefore no change from low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS9 | South Fork Clearwater Mainstem | 7.2: Sediment Conditions: Increased Sediment Quantity | 40% | 61.75 | 61.75 | 61.75 | 70 | 67 | 75 | LOC: 4 Improvements would come from habitat actions within the tributaries. | 2016: No measureable benefits to mainstem expected from upstream sediment actions. |
| Snake River Steelhead | South Fork Clearwater River | SCS9 | South Fork Clearwater Mainstem | 8.1: Water Quality: Temperature | 40% | 50 | 50 | 50 | 60 | 60 | 70 | LOC:4 Improvements would come from habitat actions within the tributaries. | 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | South Fork Clearwater River | SCS10 | Ten Mile Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 30% | 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 priotitize actions. | 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% 2016: No actions, therefore no change to low bookend. |
| Snake River Steelhead | South Fork Clearwater River | SCS10 | Ten Mile Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 70% | 83.9 | 83.9 | 83.9 | 87 | 87 | 90 | LOC: 4 Goal for cobble embeddedness is less than 30%; occular 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. Additonal non inventoried roads increase road densities above stated values. | Sediment reduction due to Tenmile Creek Bridge replacment, 2012 2016: No actions, therefore no change to low bookend |

| 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 |
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| Snake River Steelhead | Selway River | SRS1 | Lower Selway River | 1.1: Habitat Quantity: Anthropogenic Barriers | 30% | 84.5 | 84.5 | 85.3 | 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. | 3 culvert replacements for approx. 24 miles upstream passage 2016: Nineteenmile Bridge Project (2016) will open 1 mile. It is a partial barrier, so prorated at 50%=0.5 stream miles treated. Relative to the 60.4 steelhead bearing stream miles in there assessment unit, there was a 0.8% improvement. EWW 7.7.16 |
| Snake River Steelhead | Selway River | SRS1 | Lower Selway River | 7.2: Sediment Conditions: Increased Sediment Quantity | 50% | 65.1 | 65.1 | 65.3 | 75 | 69 | 80 | LOC: 4 Goal for cobble embeddedness is less than 30%. Goal for road density is 1 mile/sq. mile. | 20-30 miles of road improvement/decommissioning 2016: One bridge replacement project, weighted 10% to reflect total improvement possible from action = 0.1 stream miles treated. Relative to 60.4 steelhead bearing stream miles in the assessment unit, there will be a 0.2% improvement. EWW 7.7.16 |
| Snake River Steelhead | Selway River | SRS1 | Lower Selway River | 8.1: Water Quality: Temperature | 20% | 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). | No actions planned 2016: No actions, no change |
| Snake River Steelhead | Selway River | SRS2 | Meadow Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 100% | 90 | 92 | 94.1 | 95 | 93 | 95 | LOC: 3. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) describe sediment yield as 8% over base levels. | Horse Creek Road improvement/decommission, Falls Creek Road improvement 2016: One project anticipated in 2018 to decommission 12 miles of road, but weighted by 50% due to its landscape position (midslope) and another 50% for total possible benefit of the project results in a realized change over 3 stream miles. Relative to the 73 steelhead bearing stream miles in the assessment unit, there will be a 4.1% improvement. EWW 7.7.16 |
| Snake River Steelhead | Selway River | SRS3 | O'Hara Creek | 4.1: Riparian Condition: Riparian Vegetation | 20% | 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. | Plant 3 miles of riparian vegetation-O'Hara Creek 2016: No actions, no change to low bookend |
| Snake River Steelhead | Selway River | SRS3 | O'Hara Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 60% | 54.8 | 54.8 | 57.5 | 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. | 15 miles road improvments 2016: One Road Improvement Project in 2017 will treat 2 miles of road and benefit 5 miles of creek adjacent to stream. Because it is a riparian road, it was prorated 90%, but only 8% of that will influence the sediment problem (=0.36 stream miles. Relative to 13.1 steelhead bearing stream miles in the assessment unit, there will be a 2.7% improvement. EWW 7.7.16 |
| Snake River Steelhead | Selway River | SRS3 | O'Hara Creek | 8.1: Water Quality: Temperature | 20% | 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. | Plant riparian vegetation-O'Hara Creek 2016: No actions, therefore no change to low bookend |
| Snake River Steelhead | Selway River | SRS4 | Wilderness Area (Moose Creek, Upper Selway River, etc.) | 7.2: Sediment Conditions: Increased Sediment Quantity | 100% | 85 | 85 | 85.03 | 90 | 85 | 90 | LOC: 3. Selway and Middle Fork Clearwater Rivers Subbasin Assessment (2001) describe sediment yield as 3% over base levels. | No actions planned 2016: Invasives treatment over 24 stream miles across mid slopes will have a realized benefit of 1% = 0.12 streamiles of realized improvement. Relative to the 418.9 steelhead bearing stream miles in the assessment unit, there will be a 0.03% improvement |