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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 2.3: Injury and Mortality: Mechanical Injury | 5.00% | 80 | 80 | 100 | 100 | 100 | 100 | | 2016: Expert Panel mirrored rationale from Chinook. This one screen replacement will address all screens in the assessment unit. Therefore, the Expert Panel decided to use the difference between the low and high bookends to estimate improvement to 2018 and 2033 = 20%. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 3.1: Food: Altered Primary Productivity | 5.00% | 40 | 40 | 40 | 50 | 40 | 50 | | nutrient project scoping underway-potential benefits tbd in 2015 look back<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 25.1 | 25.1 | 25.1 | 30 | 25.5 | 35 | | CCD planting planned but not estimated - consider in 2015 workshop<br>2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 lookback as it considers vegetative growth toward PFC to 2033. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 0.00% | 11.3 | 11.3 | 11.3 | 15 | 11.3 | 15 | | 0% weight - therefore, side channels are considered in LF 6.2, instream complexity<br>2016: No actions anticipated through 2018, therefore no change from low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15.00% | 80.1 | 80.1 | 80.1 | 85 | 80.1 | 85 | Not a lot of opportunity but extrememly high benefit and priority as refuge and rearing areas are rare in this portion of the watershed<br><br>16 mile reach; 6 of 16 miles IMW control area but does have potential for treatment | Roaring Ck. - steelhead stream, may apply to juvenile Chinook rearing<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 70.3 | 70.3 | 70.3 | 72 | 70.6 | 72 | although there may not be a lot of opportunity for making changes, it is still high priority | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback as it considered progress toward PFC to 2033. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 6.2: Channel Structure and Form: Instream Structural Complexity | 25.00% | 30 | 30 | 30 | 50 | 30 | 70 | | Estimate considers RM 0.8 - 2.3 Boulder Cluster, Foreman Side Channel, Entiat Fish Hatchery - all include some LWD, ELJs - based on L Entiat RA<br>All 7 projects represent about 1/2 of opportunities<br>2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 7.2: Sediment Conditions: Increased Sediment Quantity | 15.00% | 23 | 23 | 23 | 50 | 23 | 50 | | Other actions may improve sediment conditions- evaluate in 2015 Workshop<br>2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS1 | Lower Entiat | 9.2: Water Quantity: Decreased Water Quantity | 10.00% | 50 | 50 | 50.5 | 55 | 50.5 | 55 | | 2016: One acquisition will provide an annual average of 0.7 cfs back to the stream. Relative to the 130 cfs (1996-2016 mean annual low flow), there will be a 0.5% improvement. This improvement carries forward to 2033. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 1.1: Habitat Quantity: Anthropogenic Barriers | 20.00% | 99.5 | 99.5 | 99.5 | 100 | 99.5 | 100 | | Tillicum Cr culverts are the last barriers 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 3.1: Food: Altered Primary Productivity | 20.00% | 40 | 40 | 40 | 50 | 40 | 50 | | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 4.1: Riparian Condition: Riparian Vegetation | 20.00% | 70 | 70 | 70 | 75 | 70 | 80 | | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 6.1: Channel Structure and Form: Bed and Channel Form | 20.00% | 90 | 90 | 90 | 92 | 90 | 92 | | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 91 | 91 | 92.8 | 97 | 92.8 | 99 | | 2016: One project will treat 0.3 stream miles and the benefits will be fully realized the same by 2018 and 2033. Relative to the 16.8 steelhead bearing stream miles in the assessment unit, there will be a 1.8% improvement in both 2018 and 2033. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 23 | 23 | 23 | 50 | 23 | 50 | | Roads are a source of sediment<br>2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS2 | Mad River | 9.2: Water Quantity: Decreased Water Quantity | 0.00% | | | | | | | | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 95 | 95 | 95 | 100 | 95 | 100 | | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 3.1: Food: Altered Primary Productivity | 10.00% | 40 | 40 | 40 | 50 | 40 | 55 | | 2016: No actions are anticipated through 2018, therefore the 2018 updated improvement value is the same as the low bookend. Likewise, the 2033 improvement remains as it was estimated during the 2015 Lookback. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 60.2 | 60.2 | 60.2 | 65 | 61.8 | 70 | | 2016: Two projects will treat 0.36 stream miles. Prorated to estimate realized improvement in 2018 and 2033 (respectively), the Expert Panel anticipates realized improvement over 0.0051 and 0.0816 stream miles (respectively). Relative to the 12.2 steelhead bearing stream miles in the assessment unit, there will be a 0% and 0.7% improvement. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 35.00% | 66.2 | 68 | 88.2 | 70 | 88.2 | 70 | | 2016: Two projects treated 2.69 stream miles. These projects are considered equally fully effective at achieving PFC by 2018 and 2033. Relative to the 12.2 steelhead bearing stream miles in the assessment unit (from streamnet), there will be a 22% improvement in 2018 and 2033 both. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 6.1: Channel Structure and Form: Bed and Channel Form | 5.00% | 93.4 | 97 | 98.7 | 99 | 98.7 | 99 | | Estimate considers Dillwater Project described under LF 6.2<br>Estimate assumes no social constraints affecting project implementation<br>Lower Tyee & a few unknown possibilities should get to the 99%<br><br>2016: Two projects will fully effectively treat 2.69 stream miles. Expect to exceed properly functioning condition for wood loading and channel form. 67 structures in ABC and 36 in E and F. Mostly changing pool/riffle ratio. Panel determined that projects will address/get to 100% of properly functioning condition in all but area D. The difference between 100% and 93.4% = 6.6%. Area D is 20% of total assessment unit. 20% of 6.6% = 1.3%. 6.6%-1.3% = 5.3% improvement in 2018 and 2033. Note: Panel discussed low bookend based on percentage of assessment unit that is incised/channelized/lacking wood and decided to leave bookend at 93.4%. EWW 8.24.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 6.2: Channel Structure and Form: Instream Structural Complexity | 25.00% | 39.7 | 39.7 | 62.2 | 50 | 62.2 | 60 | | 16 mile reach - 10 mi private, 6 USFS - work all on private<br>2016: Three projects will treat 2.94 stream miles. Prorated to reflect progress toward PFC in 2018 and 2033 respectively, thus the effectively treated stream miles in both years is 2.74 stream miles. Relative to the 12.2 steelhead bearing stream miles in the assessment unit, there will be a 22.5% improvement in 2018 and 2033. EWW 8.23.16 |
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 7.2: Sediment Conditions: Increased Sediment Quantity | 5.00% | 75 | 75 | 75 | 82 | 75 | 85 | | May be some benefits from riparian project so may add improvements during 2015 workshop<br>2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS3A | Middle Entiat | 9.1: Water Quantity: Increased Water Quantity | 0.00% | | | | | | | | 2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS3B | Upper Middle Entiat | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 93 | 93 | 93 | 99 | 93 | 99 | | 2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS3B | Upper Middle Entiat | 3.1: Food: Altered Primary Productivity | 45.00% | 40 | 40 | 40 | 50 | 40 | 55 | | 2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS3B | Upper Middle Entiat | 4.1: Riparian Condition: Riparian Vegetation | 0.00% | 80 | 80 | 80 | 85 | 80 | 90 | | 2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS3B | Upper Middle Entiat | 6.2: Channel Structure and Form: Instream Structural Complexity | 55.00% | 80 | 80 | 89.6 | 90 | 80 | 90 | Do not expect increased benefit after 2018 from added LWM | 2016: Two projects will fully effectively treat 0.8 stream miles. Relative to the 8.3 steelhead bearing stream miles in the assessment unit, there will be a 9.6% improvement in 2018 and 2033. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Entiat River | ERS3B | Upper Middle Entiat | 7.2: Sediment Conditions: Increased Sediment Quantity | 0.00% | 23 | 23 | 23 | 30 | 23 | 30 | | 2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Entiat River | ERS3B | Upper Middle Entiat | 9.1: Water Quantity: Increased Water Quantity | 0.00% | | | | | | | | 2016: No actions are anticipated through 2018, therefore there is no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 10.00% | 96.1 | 96.1 | 99.6 | 90 | 90 | 90 | Cambell diversion | 2016: 3.5% uplift |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 2.3: Injury and Mortality: Mechanical Injury | 5.00% | 87.5 | 87.5 | 87.5 | 95 | 90 | 95 | Are being addressed | replace 4 brush screens w/drum screens + Battie = 5<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 4.1: Riparian Condition: Riparian Vegetation | 20.00% | 70.8 | 70.8 | 70.8 | 75 | 80 | 80 | Good until you get to the WDFW property (if you are considering stream margin and not floodplain vegetation). | Basis: 32.65 riparian acres; 1.7 riparian miles; 3.2 wetland acres<br><br>2016: No actions anticipated through 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 67.6 | 67.6 | 67.6 | 80 | 70 | 80 | | 1.29 mi added or enhanced;<br>2016: No actions anticipated through 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 10.00% | 74.7 | 74.7 | 74.7 | 80 | 75 | 80 | | Basis: 6.2 mi; 2 structures<br>2016: No actions anticipated through 2018, therefore no change to low bookend |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 15.00% | 55 | 55 | 55 | 65 | 56 | 75 | | didn't consider road decommissioning in 2012 estimate<br>2016: No actions anticipated through 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 8.1: Water Quality: Temperature | 5.00% | 43.5 | 43.5 | 43.5 | 55 | 45 | 55 | | ;2016: No actions anticipated through 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Methow River | MES1 | Beaver Creek | 9.2: Water Quantity: Decreased Water Quantity | 25.00% | 73.9 | 73.9 | 73.9 | 80 | 75 | 80 | Cambell diversion; maybe others (?) | 550 AF (2 cfs) 16.5 mi<br><br>about 25% of total diversions;2016: No actions anticipated through 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Methow River | MES2 | Black Canyon | 1.1: Habitat Quantity: Anthropogenic Barriers | 20.00% | 90 | 90 | 90 | 100 | 90 | 100 | 1 culvert remaining (higher up) | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES2 | Black Canyon | 4.1: Riparian Condition: Riparian Vegetation | 0.00% | 80 | 80 | 80 | 90 | 80 | 95 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES2 | Black Canyon | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 90 | 90 | 90 | 90 | 90 | 90 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES2 | Black Canyon | 7.2: Sediment Conditions: Increased Sediment Quantity | 45.00% | 65 | 65 | 65 | 70 | 65.1 | 75 | Managed for timber harvest and grazing. Roads and recreation. | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES2 | Black Canyon | 9.2: Water Quantity: Decreased Water Quantity | 35.00% | 70 | 70 | 70 | 75 | 70.2 | 75 | | 2016: No actions expected to 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | | | | | | | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 3.1: Food: Altered Primary Productivity | 16.00% | 75 | 75 | 75 | 85 | 75 | 85 | Early Winters and Lost River Combined in 09 EP | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 4.1: Riparian Condition: Riparian Vegetation | 17.00% | 90 | 90 | 90 | 92 | 90 | 95 | Place with the riparian condition problem is the campground | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 17.00% | 90 | 90 | 91.1 | 95 | 90 | 95 | From campground down has been incised. | 2016: One project treated 0.1 stream miles and was prorated 50% to reflect progress toward PFC in 2018 (=0.05 stream miles). Relative to the 4.5 steelhead bearing stream miles in the assessment unit, there will be 1.1% improvement. EWW 8.22.16 |
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 75 | 75 | 75 | 93 | | 93 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 75 | 75 | 76.1 | 80 | 75 | 80 | | 2016: One project treated 0.1 stream miles and was prorated 50% to reflect effectiveness of treatment by 2018 (=0.05 stream miles). Relative to the 4.5 steelhead bearing stream miles in the assessment unit, there will be 1.1% improvement. EWW 8.22.16 |
| Upper Columbia Steelhead | Methow River | MES3 | Early Winters Creek | 9.2: Water Quantity: Decreased Water Quantity | 25.00% | 75 | 75 | 75 | 85 | 75.2 | 85 | Early Winters and Lost River Combined in 09 EP ; Early Winters Irrigation (16cfs?) right across from the campground | 2016: No actions expected to 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES5A | Gold Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 10.00% | 95 | 95 | 95 | 100 | 95 | 100 | Riparian mostly functioning (for being in a canyon) - biggest problems in flats and road footprint | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5A | Gold Creek | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 75 | 75 | 75 | 80 | 75.1 | 85 | Not much floodplain naturally - not much could do. | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5A | Gold Creek | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 10.00% | 45 | 45 | 45 | 50 | 45 | 50 | To go higher than 80% would have to pull major roads and get people off the creek. | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5A | Gold Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 35.00% | 70 | 70 | 70 | 75 | 70 | 80 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5A | Gold Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 30.00% | 45 | 45 | 45 | 60 | 45.1 | 75 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5A | Gold Creek | 9.2: Water Quantity: Decreased Water Quantity | 5.00% | 90 | 90 | 90 | 90.5 | 90.5 | 90.5 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5B | Libby Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 95 | 95 | 95 | 100 | 95 | 100 | | 2016: No actions expected to 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES5B | Libby Creek | 4.1: Riparian Condition: Riparian Vegetation | 35.00% | 75 | 75 | 75 | 77 | 75.3 | 80 | Confluence to border of WDFW property (~RM 1.5?) opportunities for fencing and revegetation. Evaluated for the entire watershed. | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5B | Libby Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 25.00% | 60 | 60 | 60 | 75 | 60.1 | 75 | Mouth to ~RM4 focus of this EC | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5B | Libby Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 25.00% | 45 | 45 | 45 | 60 | 45.1 | 75 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES5B | Libby Creek | 9.2: Water Quantity: Decreased Water Quantity | 10.00% | 75 | 75 | 75 | 80 | 75.2 | 80 | Diversions probably not migration barriers. | beaver could affect streamflow more than other LFs in Libby Ck<br>2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 85 | 85 | 85 | 98 | 85 | 98 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 3.1: Food: Altered Primary Productivity | 5.00% | 75 | 75 | 75 | 85 | 75 | 85 | | 2016: No actions expected to 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 55.5 | 55.5 | 55.5 | 65 | 58 | 75 | Riparian and floodplain combined in 09 EP, used lower chewuch values | remaining effects from grazing, roads, recreation...<br>2016: No actions expected to 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 25.00% | 66.5 | 66.5 | 72.6 | 70 | 57 | 70 | Most sidechannels in the lower have been cutoff, filled, and developed<br><br>10/4/12: I disagree with this comment: Some side channels may have been filled by deposition of fine sediment mainly as a natural process; not many, if any, have been developed or filled in by people | more future opportunities that would provide majority of change<br>2016: Two projects treated 0.7 side channel miles. Prorated to reflect progress toward PFC by 2018, the realized stream miles of improvement = 0.6. Relative to the total side channel miles in the assessment unit (BOR Tributary Assessment Geodatabase), there will be a 6.1% improvement. |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 6.1: Channel Structure and Form: Bed and Channel Form | 2.50% | 77 | 77 | 82.6 | 90 | 77 | 90 | | Relocations in eight-mile or 20-mile would provide benefits (not cub or boulder-above barriers)- improvements apply to tribs, mainstem in good shape<br>2016: Two projects treated 4.5 stream miles. Prorated to reflect progress toward PFC by 2018, the realized stream miles improved = 1.35. Relative to the 23.9 steelhead bearing stream miles in the assessment unit, there will be a 5.6% improvement. EWW 8.22.16 |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 6.2: Channel Structure and Form: Instream Structural Complexity | 15.00% | 78.1 | 78.1 | 81.2 | 80 | 70 | 80 | | 5 treatment areas in about 8 mi<br>2016: Two projects treated 4.5 stream miles. Prorated to reflect realized improvement by 2018, 0.75 stream miles were effectively treated. Relative to the 23.9 steelhead bearing stream miles in the assessment unit, there will be a 3.1% improvement. EWW 8.22.16 |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 50 | 50 | 50 | 52 | 50.3 | 55 | High bookend assumes some riparian improvement | beavers would improve sediments from roads<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 8.1: Water Quality: Temperature | 2.50% | 40 | 40 | 40 | 60 | 44 | 60 | | Include Pete's Ck, 10-mile, 8-mile ranches (11.75-13+ 13-15.5)<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES6 | Lower Chewuch | 9.2: Water Quantity: Decreased Water Quantity | 10.00% | 80 | 80 | 80 | 90 | 85 | 90 | Used 09 EP Lower Chewuch value | estimate doesn't include the Fulton pipe project<br><br>changes from fall to spring diversion to refill Perrygin Lake improves conditions for salmon/steelhead<br><br>5%= 10cfs aquisition/40 cfs diverted to get from 80 to 100%<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES7 | Lower Methow | 4.1: Riparian Condition: Riparian Vegetation | 25.00% | 80 | 80 | 80 | 82 | 81 | 85 | | 10/4/12: Riparian Conditions in the Lower methow have not been formally assessed so this is actually an unknown.<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES7 | Lower Methow | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 20.00% | 80 | 80 | 80 | 81 | 80 | 81 | Riparian and floodplain combined in 09 EP; Casey - I donâ€™t think there are any sidechannels that are cut off due to human features, but maybe???? | 10/4/12: This has not been assessed so is actually an unknown - there appear to be a few off channel areas that may have been lost to small push up levees.<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES7 | Lower Methow | 6.1: Channel Structure and Form: Bed and Channel Form | 25.00% | 80 | 80 | 80 | 81 | 81 | 81 | | 2016: No actions anticipated through 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES7 | Lower Methow | 6.2: Channel Structure and Form: Instream Structural Complexity | 25.00% | 75 | 75 | 75 | 80 | 76 | 80 | Casey - I am not sure we want to go here in the lower methow, but maybe so. It likely has less wood than it did historically and we know that a lot of juvenile salmonids rear in canyon habitat in other areas (Tumwater) | 01/4/12: Has not been assessed and so is an unknown - large wood sources from uspream and riparian areas is likley lower than historic conditions<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES7 | Lower Methow | 9.2: Water Quantity: Decreased Water Quantity | 5.00% | 93 | 93 | 93 | 93 | 93 | 93 | | 10/4/12: Needs further assessment. Low bookend is way to high. The lower Methow is likely flow impaired. Diversion rate from all tribs upstream is over 140cfsâ€¦Base flow condition at Pateros is around 480 cfs - this is nearly a 30% diversion rateâ€¦.<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 60 | 60 | 72.2 | 95 | 95 | 95 | | 2016: One project will treat 9.1 stream miles, but is prorated for impacts to life stages and severity of barrier (25%) for a realized treatment of 2.275 stream miles. Relative to the 18.6 steelhead bearing stream miles in the assessment unit, there will be a 12.2% uplift. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 2.3: Injury and Mortality: Mechanical Injury | 0.00% | | | | | | | | 10/4/12:MVID West push up dam, dewatereing and stranding of redds and individuals. EP to consider adding this LF to 2016 Look Forward<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 3.1: Food: Altered Primary Productivity | 8.00% | 75 | 75 | 75 | 85 | 75 | 85 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 64.3 | 64.3 | 64.6 | 64 | 75 | 75 | Used lower twisp values, riparian and floodplain combined in 09 EP | Basis: 43 acres improved<br>2016: Four projects will treat 2.11 stream miles. Prorated to reflect realized improvements in 2018, the effectively treated stream miles = 0.0623. Relative to the 18.6 steelhead bearing stream miles in the assessment unit, there will be a 0.3% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 15.00% | 51.7 | 60 | 60.2 | 60 | 60 | 60 | (below Buttermilk Creek) | Include MVID-W RM 4.6 project & Elbow Coulee Side Channel and Elbow Coulee Right<br>2016: Four projects will treat 1.31 side channel miles and the treatments will be fully effective by 2018. Relative to the 15.5 side channel miles in the assessment unit (2008 tributary assessment), there will be a 8.5% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 6.1: Channel Structure and Form: Bed and Channel Form | 15.00% | 50 | 51 | 55.8 | 60 | 51 | 60 | | Bridge Creek beaver relocation<br><br>Include MVID-W RM 4.6 project<br>2016: Five projects will treat 2.66 stream miles. Prorated to reflect progress toward PFC by 2018, 1.074 stream miles will be effectively treated. Relative to the 18.6 steelhead bearing stream miles in the assessment unit, there will be a 5.8% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 6.2: Channel Structure and Form: Instream Structural Complexity | 10.00% | 51.6 | 55 | 58.6 | 60 | 55 | 60 | (below Buttermilk Creek) | Basis: 3 miles & 20 acres improved<br>2016: Four projects will treat 2071 stream miles. Prorated to reflect progress toward PFC by 2018, 1.2955 stream miles will be effectively treated. Relative to the 18.6 steelhead bearing stream miles in the assessment unit, there will be a 7% improvement. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 8.1: Water Quality: Temperature | 7.00% | 25.1 | 25.1 | 25.5 | 40 | 30 | 40 | | major flow improvement (9.2), 5.1 actions 2016: The Expert Panel used flow improvements as a proxy for temperature benefits. Flow improvements are expected to be 8% by 2018. Prorated in recognition that flow alone doesn't fix the water temperature problem (5%), there will be a 0.4% improvement across the assessment unit. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES8 | Lower Twisp | 9.2: Water Quantity: Decreased Water Quantity | 30.00% | 42.3 | 42.3 | 49.9 | 75 | 67 | 75 | | 3400 AF/yr (15cfs)<br><br>Poorman + Devaney also include screens<br><br>15 cfs is about half the current diversion of 33 cfs moving almost 50% from 40 to 100 (67%)<br><br>Water transactions obtained by TU/YN for CBW TP<br><br>2016: Three water acquisition projects will bring 13.8 cfs (annual average) back to the streams. Relative to the 43 cfs in the assessment unit, then prorated based on affected stream miles (24%), there will be a 7.6% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 1.1: Habitat Quantity: Anthropogenic Barriers | 2.00% | 85 | 85 | 85.8 | 98 | 90 | 98 | | 1 mi TOTAL access from BOTH projects<br><br>remaining barriers on Bear Ck open to (currently) low intrinsic potential habitat<br><br>2016: One barrier will be removed and will open 0.19 stream miles. Relative to the 25.2 steelhead bearing stream miles in the assessment unit, there will be a 0.8% improvement. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 2.3: Injury and Mortality: Mechanical Injury | 8.00% | 81.5 | 95 | 95 | 95 | 95 | 95 | | Eliminate need for heavy equipment maintenance of push-up dams & eliminate fish accessibility to intake at Barkley diversion. Collaboration among WDFW screen shop/TU/Reclamation & YN<br><br>Addresses all known issues. Other projects would improve from 95-100%<br>2016: Because this screen addresses the remainder of the unscreened diversions in the assessment unit, the Expert Panel chose to use the difference between the high and low bookends as the improvement estimate = 13.5%. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 48.9 | 48.9 | 49.1 | 50 | 55 | 55 | Riparian and floodplain combined in 09 EP, 09 EP LB 45 increased to 48 in 2012 EP | 75 acres from projects listed in 2012-2016: Three projects treated 1.38 stream miles. Prorated to reflect progress toward effective treatment by 2018, 0.0414 stream miles were treated. Relative to the 25.2 steelhead bearing stream miles in the assessment unit, there will be a 0.2% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 25.00% | 63 | 65 | 67 | 70 | 68 | 70 | | Include 3R, Barkley, Whitefish, WDFW Floodplain<br><br>5 mi total improvement<br>20169: Two projects treated 1.13 side channel miles. Prorated to reflect progress toward PFC, 0.792 side channel miles were treated. Relative to the 20 miles of side channel miles in the assessment unit (from Bureau of Reclamation tributary Assessment database), there will be a 4.0% improvement. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 51.8 | 51.8 | 53.1 | 70 | 55 | 70 | Focus of much of M2 work | all 4.1/5.1 actions EXCEPT Silver (Consider in 2015 look back for anything that happens there)<br>2016: One project will treat 0.85 stream miles. Prorated to reflect progress toward PFC by 2018, 0.34 stream miles will be effectively treated. Relative to the 25.2 steelhead bearing stream miles in the assessment unit, there will be a 1.3% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 6.2: Channel Structure and Form: Instream Structural Complexity | 25.00% | 54.2 | 54.2 | 55.5 | 70 | 60 | 70 | | 2012 Basis: 4.05 mi + 118 structures (includes 8 for Lewisia * 12 for SIlver Reach)<br><br>50 to 60% treats half reach covered by existing RA; remaining 60-70% to be treated by actions from the RA to be completed<br><br>2016: One project will treat 0.85 stream miles. Prorated to reflect progress toward PFC by 2018, the effectively treated stream miles = 0.34. Relative to the 25.2 steelhead bearing stream miles in the assessment unit, there will be a 1.3% improvement. EWW 8.23.16 |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 8.1: Water Quality: Temperature | 5.00% | 77.2 | 77.2 | 77.3 | 85 | 77 | 85 | | all 4.1/5.1 + 9.2actions EXCEPT Silver (Consider in 2015 look back for anything that happens there)<br><br>Does not include BArkley or MVID- Considers that actions identified in RA cover 1/2 needs- other half to be covered by next RA<br><br>2016: recognizing that flow improvements help moderate water temperature, the expert panel considered benefits from flow increases to 2018 (1.6%). Prorated (5%) to acknowledge that increased flow alone does not improve temperature across the entire assessment unit, there will be a 0.1% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9A | Middle Methow | 9.2: Water Quantity: Decreased Water Quantity | 10.00% | 75 | 75.2 | 76.6 | 85 | 75.2 | 85 | This is look at the cummulative effect to this reach of water savings upstream. | Basis- does not include MVID/M2 BArkley; beavers in upstream areas- no effect on flow downstream<br>2016: Two permanent acquisitions were weighted (not clear what the proration factor was based on) yielding 4.1 cfs being returned to the streams annually. Relative to the 250 cfs in the assessment unit (USGS Winthrop Gauge Mean Daily Lowest Baseflow (1911-2016), there will be a 1.6% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 85 | 85 | 85 | 85 | 85 | 85 | Foghorn | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 3.1: Food: Altered Primary Productivity | 5.00% | 75 | 75 | 75 | 85 | 76 | 85 | | Implement Hancock nutrient treatment plan<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 60 | 60 | 60 | 62 | 60.2 | 65 | | includes Big Valley project<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 15.00% | 68.4 | 68.4 | 69.1 | 80 | 80 | 80 | | progress from 80-100% are actions around hatchery & WInthrop<br><br>Include Heath/Big Valley RIGHT (FWS w/funding from BPA) in 80% total<br><br>2016: One project will treat 0.2 side channel miles. Prorated to reflect progress to PFC by 2018, the effectively treated side channel miles = 0.1. Relative to the 15.1 side channel miles (from BOR tributary assessment project), there will be a 0.7% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 6.1: Channel Structure and Form: Bed and Channel Form | 23.00% | 65 | 67 | 73.3 | 75 | 70 | 75 | | includes Heath/Big Valley RIGHT<br>2016: One project will treat 0.9 stream miles. The intended improvements will be fully realized by 2018. Relative to the 10.8 steelhead bearing stream miles in the assessment unit, there will be a 8.3% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 6.2: Channel Structure and Form: Instream Structural Complexity | 22.00% | 65 | 67 | 73.3 | 75 | 70 | 75 | | Includes Heath/Big Valley RIGHT<br>2016: One project will treat 0.9 stream miles. The intended improvements will be fully realized by 2018. Relative to the 10.8 steelhead bearing stream miles in the assessment unit, there will be a 8.3% improvement. EWW 8.23.16 |
| Upper Columbia Steelhead | Methow River | MES9B | Upper-Middle Methow | 9.2: Water Quantity: Decreased Water Quantity | 20.00% | 80 | 80 | 80 | 85 | 80 | 85 | Foghorn | No effect UNLESS beaver reintroduction occurs in Hancock<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES10 | Upper Chewuch | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 90 | 90 | 90 | 92 | 90 | 95 | Early recovery from burning | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES10 | Upper Chewuch | 6.1: Channel Structure and Form: Bed and Channel Form | 5.00% | 90 | 90 | 90 | 93 | 90 | 95 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES10 | Upper Chewuch | 6.2: Channel Structure and Form: Instream Structural Complexity | 70.00% | 80 | 80 | 80 | 85 | 80 | 90 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES10 | Upper Chewuch | 7.2: Sediment Conditions: Increased Sediment Quantity | 15.00% | 90 | 90 | 90 | 92 | 90 | 95 | Sediment condition is mostly natural | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 75 | 75 | 75 | 90 | 75 | 90 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 3.1: Food: Altered Primary Productivity | 5.00% | 75 | 75 | 75 | 85 | 75 | 85 | Water quality in 09 EP no values | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 70 | 70 | 70 | 72 | 70.5 | 75 | From Weeman up to Mazama (associated with development); includes Goat Creek | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 10.00% | 60 | 60 | 60 | 75 | 65 | 75 | Some opportunity between Goat Creek and Lost River.; includes Goat Creek | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 6.1: Channel Structure and Form: Bed and Channel Form | 15.00% | 75 | 75 | 75 | 85 | 77 | 85 | Localized severe incisions, channel straightening. Most actions would occur from Lost River down to Weeman Bridge.; includes Goat Creek | 2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 6.2: Channel Structure and Form: Instream Structural Complexity | 10.00% | 75 | 75 | 75 | 85 | 77 | 85 | Most actions would occur from Lost River down to Weeman Bridge.; includes Goat Creek | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 7.2: Sediment Conditions: Increased Sediment Quantity | 5.00% | 85 | 85 | 85 | 85 | 85 | 85 | Goat creek off of White Face Mountain. Not an issue in the main channel. | minimal impact from beaver<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 9.1: Water Quantity: Increased Water Quantity | 0.00% | | | | | | | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11A | Upper Methow | 9.2: Water Quantity: Decreased Water Quantity | 40.00% | 30 | 30 | 30 | 40 | 30.5 | 40 | Dry in most years from Early Winters down to Weeman. In dry years from just below Lost River. Not entirely anthropogenic - is a losing reach and would go dry in some years anyway. Not lethal at the AU scale - fish get above, live, and leave in spite of sections that go dry.; includes Wolf Creek | most beaver relocation in Goat Ck-<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 75 | 75 | 75 | 98 | | 98 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 3.1: Food: Altered Primary Productivity | 20.00% | 75 | 75 | 75 | 85 | 75 | 85 | Used same values as Early Winters | 2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 4.1: Riparian Condition: Riparian Vegetation | 25.00% | 85 | 85 | 85 | 87 | 85 | 90 | Lost river combined with early winters in 09 EP | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 30.00% | 85 | 85 | 85 | 85 | 85 | 85 | Evaluated for watershed | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 6.1: Channel Structure and Form: Bed and Channel Form | 25.00% | 85 | 85 | 85 | 85 | 85 | 85 | Sugar Dike ~RM1.5(?); Evaluated from watershed perspective (LBE would be lower if look at % opportunity) | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 60 | 60 | 60 | 90 |  | 90 |  | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES11B | Lost River | 9.1: Water Quantity: Increased Water Quantity | 0.00% |  |  |  |  |  |  |  | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 93 | 93 | 93 | 94 | 93 | 96 |  | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 3.1: Food: Altered Primary Productivity | 20.00% | 75 | 75 | 75 | 85 | 77 | 85 |  | YN- implement nutrient enhancement assessment<br><br>uncertain of potential benefits- low initial est.<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 85 | 85 | 85 | 88 | 85 | 92 | | release upstream from disturbed area<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 15.00% | 85 | 85 | 85 | 88 | 85 | 92 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 6.1: Channel Structure and Form: Bed and Channel Form | 20.00% | 90 | 90 | 90 | 93 | 90 | 95 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 6.2: Channel Structure and Form: Instream Structural Complexity | 20.00% | 92.5 | 92.5 | 92.5 | 95 | 93 | 95 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 7.2: Sediment Conditions: Increased Sediment Quantity | 10.00% | 90 | 90 | 90 | 95 | 90.5 | 95 | | beaver release likely in tribs (Buttermilk Ck)- tribs are sediment source; small % of issue<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES12 | Upper Twisp | 9.1: Water Quantity: Increased Water Quantity | 0.00% | | | | | | | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES13 | Wolf Creek | 2.3: Injury and Mortality: Mechanical Injury | 10.00% | 75 | 75 | 75 | 90 | 90 | 90 | need to evaluate status of screens in Wolf Ck | fix Wolf Ck ID screen (in wilderness)<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Methow River | MES13 | Wolf Creek | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 80 | 80 | 80 | 82 | 80 | 85 | Lower 2 miles; RM 0-2.5 | release site likely upstream from private land (where direct fish benefits would accrue)<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES13 | Wolf Creek | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 10.00% | 75 | 75 | 75 | 80 | 75 | 80 | Lower 2 miles; RM 0-2.5 | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES13 | Wolf Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 35.00% | 75 | 75 | 75 | 80 | 75 | 80 | Focus on low 3-4 miles | release upstream from impacted reach<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Methow River | MES13 | Wolf Creek | 9.2: Water Quantity: Decreased Water Quantity | 30.00% | 65 | 65 | 65 | 70 | 70 | 70 | Wolf Creek Irrigation Diversion; Biddle Ponds(?) | TU worked w/I.D. to lower target from 7.5 to 7 cfs in late season (Aug-Sep)- .5 cfs improvement<br>2016: No actions anticipated through 2018, therefore no change to low bookend. |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS1 | Loup Loup Creek | 4.1: Riparian Condition: Riparian Vegetation | 13.00% | 50 | 50 | 50 | 60 | 50 | 75 | High: Old values=LB-50%, 2018=75% & 2033=80% which represents a 25% to 30% change??? Riparian benefits will be small initially then grow over time. 10% increase from action in the 10-12 period with benefits from these same actions improving to 25% by 2033. ; %: o be accomplished in lower reach, adjacent to bottomless box culverts. OCD will plant during spring of 2012, benefits from perenial flows being reestablished beginning in 2011. | 2016: No actions, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS1 | Loup Loup Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 12.00% | 70 | 70 | 70 | 80 | 80 | 80 | %: Wood recruitment not likely to occur in the next 50 years due to past development. Adding wood in short term mayâ€¦. | 2016: No actions, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS1 | Loup Loup Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Based on OBMEP data and EDT values of 14% fines in spawning gravels??? | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS1 | Loup Loup Creek | 9.2: Water Quantity: Decreased Water Quantity | 55.00% | 50 | 70 | 70 | 70 | 70 | 70 | High: Old values=LB-10%, 2018 & 2033=70% which represents a 60% change??? 10 to 50 for current actions during the 10-12 period with potential for another 20% ; Low: Barrier half of the habitat for all the fish ; %: Increase irrigation efficiency or alternative water source, (lease) | 2016: This is the most limiting factor in the Assessment Unit; low flows and overwintering flows limit fish populations. Projects will focus water in mainstem Loup Loup rather than spreading it among tributaries resulting in inefficient water delivery. Based on bookends from previous panels, a 20% increase in flow function remained possible due to these projects, therefore, the Panel assigned 20% expected uplift. EWW 8.17.16 |
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 2.1: Injury and Mortality: Predation | 15.00% | 57 | 57 | 57 | 90 | 57 | 90 | High: Old values=LB-30%, 2018&2033=50% which represents a 20% change??? ; Low: Bird predation from Grant PUD studies is 14% assumed at least an equal impact from Piscivor predation plus another 5% to account for other sources (i.e. bear, otter, pelican, unknown). | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 2.3: Injury and Mortality: Mechanical Injury | 3.00% | 98 | 98 | 98 | 98 | 87.5 | 98 | High: If all pump screens meet NOAA criteria. Number based on original EP table. ; Low: Unknown but also unlikely to have much impact on listed stocks with the exception of emergant summer steelhead.<br><br>LOW BOOKEND CHANGED FROM 96 TO 80% | EACH SCREEN IS 1/130 (TREATED/OUT-OF-COMPLIANCE SCREENS)<br>2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 3.2: Food: Food-Competition | 1.00% | 95 | 95 | 95 | 95 | 95 | 95 | Low: This impact would be limited to actively rearing summers steelhead at time of release. | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 4.1: Riparian Condition: Riparian Vegetation | 0.00% | 70 | 70 | 70 | 85 | | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 60 | 60 | 60 | 80 | | 85 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 8.1: Water Quality: Temperature | 4.00% | 35 | 35 | 35 | 35 | 35 | 35 | Low: Makes these habitats largely uninhabitatable from July to October in most years. (ie habitable 75% of year) | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2A | Wells Pool (inundated-Confluence to Chilliwist Creek) | 9.3: Water Quantity: Altered Flow Timing | 77.00% | 25 | 25 | 25 | 25 | 25 | 25 | Low: Habitat ranges from roughly 100% to 50% altered from the historic as you move upstream estimate of 75% alteration and 25% function. ; % Altered hydrograph has affected fine sediment, temperature, wood accumulation, and habitat complexity. If not going to change the hydrograph (i.e. remove Wells Dam), then the only actions that should occur are predation reduction and fixing pump screens. 1-1D combined for 1 EP% | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 2.1: Injury and Mortality: Predation | 5.00% | 60 | 60 | 60 | 65 | 60 | 65 | Low: Most predation in this reach would be limited to mostly emergent summer steelhead fry by SMB??? Potential 5% increase related to potential removal of some portion of SMB population. | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 2.3: Injury and Mortality: Mechanical Injury | 3.00% | 98 | 98 | 98 | 98 | 87.5 | 98 | High: If all pump screens meet NOAA criteria. Number based on original EP table. ; Low: Unknown but also unlikely to have much impact on listed stocks with the exception of emergant summer steelhead.<br><br>LOW BOOKEND CHANGED FROM 95 TO 80% | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 3.2: Food: Food-Competition | 1.00% | 85 | 85 | 85 | 85 | 85 | 85 | Low: Based upon EDT outputs related to actively rearing NOR's | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 4.1: Riparian Condition: Riparian Vegetation | 1.00% | 60 | 60 | 60 | 62 | 60 | 65 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 7.00% | 55.5 | 60 | 55.5 | 65 | 60 | 65 | Low: (85% based upon linear length impacted) - LBE based calibrated agains Bed and Channel Form. UBEs based on opportunity for large project. Think that the Conservancy Island project may be worth 10%. May be other opportunities. ; %: | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 50 | 50 | 50 | 50 | 50 | 50 | Low: (90% based upon linear length impacted) - 50% as calibrated by WG ; %: Covers habitat complexity, overstabilization from riprap, and channel incision. | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 6.2: Channel Structure and Form: Instream Structural Complexity | 2.00% | 70 | 70 | 70 | 75 | 70 | 75 | Low: Not a single log jam of any consequence exists within this reach although several LWD collection sites do exist. Loss of upstream wood sources. ; %: Although wood will increase ambush opportunities for predators the literature suggests that woody habitats benefit the prey more than the predator (Robertson and Crook 1999, Roni and Quinn 2001). | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 7.2: Sediment Conditions: Increased Sediment Quantity | 37.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Based on OBMEP data and EDT values of 14% fines in spawning gravels??? ; %: What spawning is occurring in this reach is being rapidly reduced by fine sediments claiming spawning gravels | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 8.1: Water Quality: Temperature | 29.00% | 35 | 35 | 35 | 40 | 36 | 40 | Low: Makes these habitats largely uninhabitatable from July to October in most years. ; %: High summer temperatures<br><br>HIGH BOOKEND FORM 35 TO 40% | Conservancy Island temp benefit- similar to Peterson<br><br>10/5/12: New information suggests this could be a lot more beneficial based on groundwater influence in sidechannel---- might need to readjust during 2015 look back.<br><br>2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS2B | Okanogan River 01 (Chilliwist to Salmon) | 9.2: Water Quantity: Decreased Water Quantity | 5.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 2.1: Injury and Mortality: Predation | 4.00% | 60 | 60 | 60 | 65 | 60 | 65 | Low: Most predation in this reach would be limited to mostly emergent summer steelhead fry by SMB??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 2.3: Injury and Mortality: Mechanical Injury | 1.00% | 98 | 98 | 98 | 98 | 87.5 | 98 | High: If all pump screens meet NOAA criteria. Number based on original EP table. ; Low: Unknown but also unlikely to have much impact on listed stocks with the exception of emergant summer steelhead.<br><br>CHANGE LOW BOOKEND FROM 95 TO 80% | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 3.2: Food: Food-Competition | 1.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Based upon EDT outputs related to actively rearing NOR's | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 4.1: Riparian Condition: Riparian Vegetation | 1.00% | 60 | 60 | 60 | 62 | 60 | 65 | Low: (35% based upon % alteration of aerial images along length of the reach) ; % Riparian habitat has been substainially disturbed by reduced floodplain interaction and agricultural development and land clearing. However, benefits to fish on a stream this wide are marginal at best. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 20.00% | 60 | 60 | 60 | 75 | 60 | 75 | Low: Based upon linear length impacted ; %: Railroads, highways, and dikes cutting off lateral migration and interaction with floodplain | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 10.00% | 60 | 60 | 60 | 75 | 60 | 75 | Low: Based upon linear length impacted ; %: Railroads, highways, and dikes cutting off lateral migration and interaction with floodplain | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 60 | 60 | 60 | 75 | 60 | 75 | Low: Based upon linear length impacted ; %: Riprap reducing channel migration zone - Railroads, highways, and dikes cutting off lateral migration and interaction with floodplain | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 6.2: Channel Structure and Form: Instream Structural Complexity | 1.00% | 70 | 70 | 70 | 75 | 70 | 75 | Low: only 1 log jam of any consequence exists within this reach although several LWD collection sites do exist. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 90 | 90 | 90 | 90 | 90 | 90 | Low: Based on OBMEP data and EDT values of 9% fines in spawning gravels??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 8.1: Water Quality: Temperature | 30.00% | 30 | 30 | 30 | 35 | 30 | 35 | Low: Makes these habitats largely uninhabitatable from July to October in most years. ; %: Provide or augment flows in tributaries which would result in cold water refugia | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3A | Okanogan River 02 (Salmon Creek to Omak Creek) | 9.2: Water Quantity: Decreased Water Quantity | 2.00% | 95 | 95 | 95 | 95 | 95 | 95 | Low: Kistler & Arterburn 2006-OBMEP water quality and quanitity report. | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 2.1: Injury and Mortality: Predation | 5.00% | 60 | 60 | 60 | 65 | 60 | 65 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 2.3: Injury and Mortality: Mechanical Injury | 3.00% | 98 | 98 | 98 | 98 | 87.5 | 98 | High: If all pump screens meet NOAA criteria. Number based on original EP table.<br><br>LOW BOOKEND CHANGED FROM 95 TO 80% | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 3.2: Food: Food-Competition | 10.00% | 85 | 85 | 85 | 85 | 85 | 85 | Low: May be a bigger issue in the future because of location of Chief Joseph Hatchery acclimation ponds %: May be a bigger issue in the future because of location of Chief Joseph Hatchery acclimation ponds | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 4.1: Riparian Condition: Riparian Vegetation | 1.00% | 50 | 50 | 50 | 52 | 50 | 55 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 7.00% | 60 | 60 | 60 | 62 | 60 | 62 | Low: Based upon linear length impacted | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 60 | 60 | 60 | 65 | 61 | 65 | Low: Based upon linear length impacted ; %: Covers habitat complexity, overstabilization from riprap, and channel incision.<br><br>HIGH BOOKEND CHANGED FROM 60 TO 65% | ACTION DESIGNED FOR FALL CHINOOK-SOME BENEFIT TO STEELHEAD<br>2016: No actions anticipated by 2018, therefore no change to low bookend<br><br>10/5/12: if this benefit is tied to Hopkins sidechannel there will not be benefit summer/fall chinook. Hopkins is designed for summer thermal refugia for steelhead. |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 6.2: Channel Structure and Form: Instream Structural Complexity | 2.00% | 70 | 70 | 70 | 75 | 70 | 75 | Low: only 2 log jam of any consequence exists within this reach although several LWD collection sites do exist. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 7.2: Sediment Conditions: Increased Sediment Quantity | 28.00% | 70 | 70 | 70 | 70 | 70 | 70 | Low: Based on OBMEP data and EDT values of 24% fines in spawning gravels. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 8.1: Water Quality: Temperature | 29.00% | 35 | 35 | 35 | 35 | 35 | 35 | | 10/5/12: some small benefit (1%) should have been given to steelheadhere based on Hopkins sidechannel<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3B | Okanogan River 03 (Omak to Riverside) | 9.2: Water Quantity: Decreased Water Quantity | 5.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 2.1: Injury and Mortality: Predation | 7.00% | 60 | 60 | 60 | 65 | 60 | 65 | High: Old values=LB-30%, 2018&2033=50% which represents a 20% change??? | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 2.3: Injury and Mortality: Mechanical Injury | 12.00% | 98 | 98 | 98 | 98 | 84 | 98 | High: If all pump screens meet NOAA criteria. Number based on original EP table.<br><br>CHANGED LOW BOOKEND FROM 95 TO 80%- more screens in this reach than others THAT ARE OUT OF COMPLIANCE AND NEED REPLACEMENT | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 3.2: Food: Food-Competition | 1.00% | 85 | 85 | 85 | 85 | 85 | 85 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 4.1: Riparian Condition: Riparian Vegetation | 5.00% | 55 | 55 | 55 | 60 | 57.5 | 65 | | |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 20.00% | 55 | 55 | 55 | 75 | 56 | 75 | High: No direct relationship to old EP tables ; %: What about Wilson's? | CONSIDERING PETERSON ALCOVE 8.1 ACTION<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 5.00% | 56.2 | 56.2 | 56.2 | 75 | 55 | 75 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 6.1: Channel Structure and Form: Bed and Channel Form | 5.00% | 50 | 50 | 50 | 50 | 50 | 50 | %: Railroad confines migration to a degree, but already confined | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 6.2: Channel Structure and Form: Instream Structural Complexity | 1.00% | 75 | 75 | 75 | 80 | 75 | 80 | Low: No 2 log jam of any consequence exists within this reach although several LWD collection sites do exist. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 7.2: Sediment Conditions: Increased Sediment Quantity | 10.00% | 85 | 85 | 85 | 85 | 85 | 85 | Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? ; % Should be addressed upstream in source reaches | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 8.1: Water Quality: Temperature | 30.00% | 35 | 35 | 35 | 40 | 36 | 40 | CHANGED HIGH BOOKENDS FROM 35 TO 40 | Small part of total reach length. Monitoring will provide insight on benefits. Final value will be evaluated considering supplemental info tbd- also potential benefit to 5.1 tbd later<br>2016: No actions anticipated by 2018, therefore no change to low bookend<br><br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3C | Okanogan River 04 (Riverside to Janis Bridge) | 9.2: Water Quantity: Decreased Water Quantity | 4.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 2.1: Injury and Mortality: Predation | 10.00% | 60 | 60 | 60 | 65 | 60 | 65 | High: Old values=LB-30%, 2018&2033=50% which represents a 20% change??? | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 2.3: Injury and Mortality: Mechanical Injury | 8.00% | 98 | 98 | 98 | 98 | 96 | 98 | High: If all pump screens meet NOAA criteria. Number based on original EP table.<br><br>GROUP REEDUCED LOW BOOKEND FROM 95 TO 92 % | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 3.2: Food: Food-Competition | 3.00% | 70 | 70 | 70 | 70 | 70 | 70 | Low: Bonaparte Creek Acclimation site | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 4.1: Riparian Condition: Riparian Vegetation | 7.00% | 45 | 45 | 45 | 47 | 45 | 50 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 6.1: Channel Structure and Form: Bed and Channel Form | 13.00% | 80 | 80 | 80 | 85 | 80 | 85 | %: Bank instability and riparian degradation | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 6.2: Channel Structure and Form: Instream Structural Complexity | 1.00% | 65 | 65 | 65 | 85 | 65 | 85 | Low: No log jams of any consequence exists within this reach although several LWD collection sites do exist. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 7.2: Sediment Conditions: Increased Sediment Quantity | 17.00% | 85 | 85 | 85 | 85 | 85 | 85 | Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 8.1: Water Quality: Temperature | 36.00% | 35 | 35 | 35 | 35 | 35 | 35 | %: Note on difficulties when considering multiple species: Warm temperature could be beneficial for ocean-type salmonids because of reduced competition. But #1 limiting factor for stream-types. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS3D | Okanogan River 05 (Janis to Siwash Creek) | 9.2: Water Quantity: Decreased Water Quantity | 5.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 33 | 33 | 33 | 96 | | 96 | | 10/5/12: comment should be that mission falls is part of Upper Omak so there are no barriers in lower Omak<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 3.2: Food: Food-Competition | 30.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Assumes ongoing stocking of 30,000 summer steelhead annually ; %: Could increase as potential exists for not only high quantiies to be stocked but also muiltiple species | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 4.1: Riparian Condition: Riparian Vegetation | 5.00% | 90 | 90 | 90 | 90 | 90 | 90 | Low: Mostly degraded on private land in holdings %: Missing large wood | 10/5/12: low bookend may need to be adjusted next time due to fire<br>2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 6.1: Channel Structure and Form: Bed and Channel Form | 5.00% | 50 | 50 | 50 | 50 | 50 | 50 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 6.2: Channel Structure and Form: Instream Structural Complexity | 8.00% | 95.5 | 95.5 | 95.5 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 75 | 75 | 75 | 85 | 75 | 85 | Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 8.1: Water Quality: Temperature | 12.00% | 90 | 90 | 90 | 90 | 90 | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4A | Lower Omak Creek (Mouth to Mission Falls) | 9.2: Water Quantity: Decreased Water Quantity | 15.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Habitat in lower Omak Creek considered to be in excellent condition | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 1.1: Habitat Quantity: Anthropogenic Barriers | 71.00% | 38.2 | 38.2 | 38.2 | 60 | 40 | 60 | Low: Currently, no access above Mission Falls ; %: Removed approximately 3,000 cubic yds of material in 2011; anticipate an additional 3,000 cubic yds in 2012, access to estimated 17 miles of spawning and rearing habitat | Several implemented projects have not resulted in passage yet. Full benefit depends on extent of success of project. Group chose mid-way to full success to be re-evaluated at next cycle.<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 3.2: Food: Food-Competition | 1.00% | 90 | 90 | 90 | 90 | 90 | 90 | Low: Based upon past but no future hatchery stocking in this area. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 4.1: Riparian Condition: Riparian Vegetation | 1.00% | 70 | 70 | 70 | 75 | 70 | 80 | High: Old values=LB-95%, 2018& 2033=96% which represents a 1% change??? Are there other oppertunities???? ; %: Plant vegetation along reactivated floodplain in Disatuel area | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 6.1: Channel Structure and Form: Bed and Channel Form | 5.00% | 95 | 95 | 95 | 96 | 95 | 96 | High: Old values=LB-95%, 2018& 2033=96% which represents a 1% change??? Are there other oppertunities???? : %: activate floodplain in Disautel Reach | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 6.2: Channel Structure and Form: Instream Structural Complexity | 1.00% | 80 | 80 | 80 | 85 | 80 | 85 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 7.1: Sediment Conditions: Decreased Sediment Quantity | 0.00% | 25 | 25 | 25 | 60 | | 60 | High: Old values=LB-30%, 2018=35% & 2033=60% which represents a 5% to 30% change??? Expected long-term benefits from past projects???? Past projects credited with 2% gain in 7-9 period with longer term gain of 14%. How much benefit for actions in 10 to 12?? and 13-15??? ; Low: Based on old values??? What would V-star suggest???? ; %: remove 18" culvert; replace with 36" culvert in 2012 | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 25.3 | 25.3 | 26.7 | 60 | 27 | 60 | High: Old values=LB-30%, 2018=35% & 2033=60% which represents a 5% to 30% change??? Expected long-term benefits from past projects???? Past projects credited with 2% gain in 7-9 period with longer term gain of 14%. How much benefit for actions in 10 to 12?? and 13-15??? ; Low: Based on old values??? What would V-star suggest???? ; %: remove 18" culvert; replace with 36" culvert in 2012<br><br>NOTE: GROUP CHANGED 7.1 TO 0 AND 7.2 TO 20%- TOO MUCH SEDIMENT IS THE LIMITING FACTOR | 1%- road decommissioning; springs/fencing: 1%; culverts: pre-emptive protect from further degradation; more benefits to these actions in long term than short term; treating 5/247 mi of roads in this watershed<br><br>2016: As per expert panel, road density is very high here (4.5 miles per square mile. PFC is 2 miles/sq mi. Therefore 352 miles of road need to be put to bed to be at PFC. Expert Panel anticipates decommissioning of 5 miles of those roads by 2018 = 5/352 = **Expert panel felt that this was an underestimate of the effect of this project, as it doesn't take into account road position with respect to riparian area. Next time, use % of riparian roads. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 8.1: Water Quality: Temperature | 0.00% | 75 | 75 | 75 | 90 | | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS4B | Upper Omak Creek (Upstream from Mission Falls) | 9.2: Water Quantity: Decreased Water Quantity | 1.00% | 80 | 80 | 80 | 90 | 80 | 90 | %: Only so much water to go around | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS5A | Lower Salmon Creek (OID to Mouth) | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 60 | 60 | 60 | 90 | | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5A | Lower Salmon Creek (OID to Mouth) | 3.2: Food: Food-Competition | 7.00% | 100 | 100 | 100 | 100 | 100 | 100 | High: No old values to consider ; Low: Based upon existing plans for continued stocking at 50,000/year | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5A | Lower Salmon Creek (OID to Mouth) | 4.1: Riparian Condition: Riparian Vegetation | 0.00% | 60 | 60 | 60 | 90 | | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5A | Lower Salmon Creek (OID to Mouth) | 6.2: Channel Structure and Form: Instream Structural Complexity | 3.00% | 29.1 | 29.1 | 29.1 | 70 | 25 | 70 | High: These values are no longer relatible to the old EP tables as percentages were for the entire stream. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5A | Lower Salmon Creek (OID to Mouth) | 8.1: Water Quality: Temperature | 0.00% | | | | | | | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS5A | Lower Salmon Creek (OID to Mouth) | 9.2: Water Quantity: Decreased Water Quantity | 90.00% | 39 | 39 | 57.75 | 65 | 39 | 65 | High: These values are no longer relatible to the old EP tables as percentages were for the entire stream. Improvements in the 2010-2012 period would be 17% ; Low: 22% is based upon existing agreements (#days per year w/water from water lease)and is an increase from 1-5% resulting from overflows at Conconully Dam prior to this agreement. ; %: Increase lease amount, increase storage | 10/5/12: Some benefit could be gained before 2018 but there is not enough information to make a change now. 2016: Past leases already accounted for through 2018. New project: Okanogan Irrigation District 50-year lease 1,800 acre-ft. Goal is 3,600 acre-ft to get perennial flow with less temperature concern in summer. 1,800 acre-ft, which will get to 75% of the 3,600 acre-feet. 1,800/2,400 = 0.75 * remaining gap (25%) = 18.75% uplift. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 60 | 60 | 60 | 90 | | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 2.1: Injury and Mortality: Predation | 6.00% | 90 | 90 | 90 | 90 | 90 | 90 | Low: Predation is closely tied to hatchery program resisuals plus eastern book trout and a few smallmouth bass | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 3.2: Food: Food-Competition | 7.00% | 72 | 72 | 72 | 72 | 72 | 72 | High: No old values to consider ; Low: Based upon existing plans to continue annaul releases of 50,000 summer steelhead. ; %: | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 80 | 80 | 80 | 80 | 80 | 80 | | 2016: 0.03 stream miles will be treated, but this will not lead to a measureable benefit by 2018. Therefore there will be no change from low bookend. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 6.1: Channel Structure and Form: Bed and Channel Form | 15.00% | 65.2 | 65.2 | 65.2 | 75 | 66 | 75 | High: Old values=LB-65%, 2018=75% & 2033=80% which represents a 10% to 15% change??? Based on existing numbers, No work during the 10-12 period how much is likely to occur in the 13-15 period??? ; %: Site specific to willing landowners (Knutson & McCormick - to be accomplished 2012) | 10/5/12: benefits from McCormick and could be a little higher but can be adjusted later in the look back<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 6.2: Channel Structure and Form: Instream Structural Complexity | 2.00% | 91.4 | 91.4 | 91.4 | 90 | 90 | 90 | Low: Stream structure is in pretty good shape | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 81.4 | 81.4 | 82.12 | 85 | 80 | 85 | High: No old values to consider ; Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? ; %: Site specific to willing landowners (Knutson & McCormick - to be accomplished 2012) | 2016: A bio-engineered bank stabilization project will treat 0.19 miles relative to the 26.52 miles of banks in the Assessment Unit = 0.72% improvement. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS5B | Upper Salmon Creek (OID to Conconully Dam) | 9.2: Water Quantity: Decreased Water Quantity | 35.00% | 33 | 33 | 53.25 | 60 | 33 | 60 | High: Assumes agreements can be secured to provide perenial flows in Lower Salmon Creek ; Low: Winter flows are 1/3rd of historic | 2016: Okanogan Irrigation District 50-year lease 1,800 acre-ft. Goal is 3,600 acre-ft to get perennial flow with less temperature concern in summer. 1,800 acre-ft, = 20.25% uplift. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 2.1: Injury and Mortality: Predation | 0.00% | 30 | 30 | 30 | 50 | | 50 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 2.2: Injury and Mortality: Pathogens | 0.00% | 90 | 90 | 90 | 90 | | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 4.1: Riparian Condition: Riparian Vegetation | 25.00% | 40 | 40 | 40 | 42 | 40 | 45 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 6.1: Channel Structure and Form: Bed and Channel Form | 25.00% | 70 | 70 | 70 | 75 | 70 | 75 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 6.2: Channel Structure and Form: Instream Structural Complexity | 25.00% | 70 | 70 | 70 | 75 | 70 | 75 | Low: No log jams of any consequence exists within this reach although several LWD collection sites do exist. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 70 | 70 | 72.31 | 75 | 70 | 75 | High: Old values=LB-65%, 2018=75% & 2033=80% which represents a 10% to 15% change??? Less sure of 2033 values (will these actions persist?). ; Low: Based on OBMEP data and EDT values of 24% fines in spawning gravels. ; %: Similkameen River depositional zone. | 2016: A bio-engineered bank stabilization project will treat 0.19 miles out of 4.12 miles (2 times for each bank) in the assessment unit, resulting in 2.31% uplift (=0.19/8.24*100). EWW 8.19.16 |
| Upper Columbia Steelhead | Okanogan River | ORS6A | Lower Similkameen (Confluence To Cross Channel) | 8.1: Water Quality: Temperature | 0.00% | 47 | 47 | 47 | 65 | | 75 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 2.1: Injury and Mortality: Predation | 18.00% | 85 | 85 | 85 | 85 | 85 | 85 | Low: A lot of focused harvest on summer steelhead occurs in this reach ; %: poaching, and harrassment | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 2.2: Injury and Mortality: Pathogens | 12.00% | 45 | 45 | 45 | 45 | 45 | 45 | Low: Hatchery activities have focused effort and spawner returns in this area. ; %: Location of Similkameen Acclimation site | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 3.2: Food: Food-Competition | 12.00% | 56 | 56 | 56 | 56 | 56 | 56 | Low: Acclimatation pond here. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 4.1: Riparian Condition: Riparian Vegetation | 4.00% | 60 | 60 | 60 | 62 | 60 | 65 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 8.00% | 40 | 40 | 40 | 50 | 40 | 50 | %: Historic channels are plentiful | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 75 | 75 | 75 | 75 | | 80 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 7.1: Sediment Conditions: Decreased Sediment Quantity | 13.00% | 70 | 70 | 70 | 75 | 70 | 75 | %: Gravel recruitment and retention issues continue thorugh middle reaches. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 7.2: Sediment Conditions: Increased Sediment Quantity | 0.00% | 65 | 65 | 65 | 75 | | 80 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 8.1: Water Quality: Temperature | 30.00% | 45 | 45 | 45 | 50 | 45 | 50 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6B | Middle Similkameen (Cross Channel to Canyon) | 8.3: Water Quality: Gas Saturation | 3.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Only an issue during high discharge | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 2.1: Injury and Mortality: Predation | 15.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Only an issue during high discharge ; %: poaching, and harassment | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 2.2: Injury and Mortality: Pathogens | 9.00% | 75 | 75 | 75 | 75 | 75 | 75 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 3.2: Food: Food-Competition | 8.00% | 77 | 77 | 77 | 77 | 77 | 77 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 4.1: Riparian Condition: Riparian Vegetation | 0.00% | 80 | 80 | 80 | 82 | | 84 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 75 | 75 | 75 | 75 | | 80 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 7.1: Sediment Conditions: Decreased Sediment Quantity | 26.00% | 40 | 40 | 40 | 40 | 40 | 40 | %: Gravel recruitment is a problem in the upper portions (canyon section in particular). | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 7.2: Sediment Conditions: Increased Sediment Quantity | 0.00% | 65 | 65 | 65 | 75 | | 80 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 8.1: Water Quality: Temperature | 30.00% | 83 | 83 | 83 | 83 | 83 | 83 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS6C | Upper Similkameen (Canyon to Enloe Dam) | 8.3: Water Quality: Gas Saturation | 12.00% | 75 | 75 | 75 | 75 | 75 | 75 | Low: Only an issue during high discharge | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7A | Chiliwist Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 60 | 60 | 60 | 60 | 60 | 60 | Low: Mostly due to naturally occuring conditions (including flow, gradient, culvert) ; %: Steep gradient prevents access | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7A | Chiliwist Creek | 4.1: Riparian Condition: Riparian Vegetation | 5.00% | 25 | 25 | 25 | 30 | 25 | 35 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7A | Chiliwist Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 55 | 55 | 55 | 60 | 55 | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7A | Chiliwist Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 15.00% | 40 | 40 | 40 | 45 | 40 | 45 | Low: Based on OBMEP data and EDT values of 18% fines in spawning gravels??? ; %: Consider reducing sediment sources from roads | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7A | Chiliwist Creek | 8.1: Water Quality: Temperature | 0.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7A | Chiliwist Creek | 9.2: Water Quantity: Decreased Water Quantity | 75.00% | 70 | 70 | 70 | 80 | 70 | 80 | Low: Unknown how many or magnetude of water withdrawls??? ; %: Consider options to minimze withdrawals and adjacent shallow wells | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 40 | 40 | 40 | 90 | 40 | 90 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 4.1: Riparian Condition: Riparian Vegetation | 5.00% | 50 | 50 | 50 | 52 | 50 | 55 | High: Should this be 1.1 and related to flow??? ; Low: Little or no riparian vegetation exists along this stream | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 3.00% | 60 | 60 | 60 | 60 | 60 | 60 | High: How much of the lower 1/2 mile will be treated? ; Low: Lower half mile is wide and shallow with little complexity upper half mile is narrow deep and complex : ; %: In the lower reach (1.0 mile) consider instream structure to create pool habitat to increase rearing habitat | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 2.00% | 50 | 50 | 50 | 60 | 50 | 60 | High: How much of the lower 1/2 mile will be treated? ; Low: Lower half mile is wide and shallow with little complexity upper half mile is narrow deep and complex : ; %: In the lower reach (1.0 mile) consider instream structure to create pool habitat to increase rearing habitat | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 80 | 80 | 80 | 85 | 80 | 85 | Low: Based on OBMEP data and EDT values of 14% fines in spawning gravels??? ; %: Prevent access by livestockâ€¦browsing of riparian vegetation, decreased bank stability | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 8.1: Water Quality: Temperature | 15.00% | 80 | 80 | 80 | 85 | 80 | 85 | %: Input of groundwater will reduce water temperature | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7B | Wanacut Creek | 9.2: Water Quantity: Decreased Water Quantity | 50.00% | 25 | 25 | 25 | 50 | 25 | 50 | High: Old values=LB-50%, 2018& 2033=80% which represents a 30% change??? Will this restore perenial flows to the entire lower portion of the stream (100%)??? Are there other oppertunities for more water???? ; Low: Currently about 1/2 of the reach has intermittant flows. : ; %: Augment stream flow with groundwater from a well, max. flow 1 cfs | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 40 | 40 | 40 | 90 | 40 | 90 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 85 | 85 | 85 | 85 | 85 | 85 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 2.00% | 85 | 85 | 85 | 85 | 85 | 85 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 3.00% | 90 | 90 | 90 | 90 | 90 | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 75 | 75 | 75 | 80 | 77 | 80 | High: Small initial impact but might have considerable longer term impact if project covers a large enough area??? ; Low: Based on OBMEP data and EDT values of 18% fines in spawning gravels??? ; %: reduce sediment sources associated with logging activities in the upper watershed (Browns Pass) | LT est of 2%; ST estimate tbd<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 8.1: Water Quality: Temperature | 5.00% | 95 | 95 | 95 | 95 | 95 | 95 | High: Not likely to impact temperature. ; %: relocate turbine well away from stream channel, predicted to result in increased flow and reduced stream temperature | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7C | Tunk Creek | 9.2: Water Quantity: Decreased Water Quantity | 50.00% | 60 | 60 | 60 | 95 | 85 | 95 | High: how much will this incease flows? ; Low: Many threats to flows in upper watershed, occassionally lower 1-mile becomes intermittent ; %: relocate turbine well away from stream channel | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 71.00% | 20 | 20 | 20 | 100 | 90 | 100 | High: Will this address all barriers???? Will it persist??? ; Low: Only accessible habitat is currently contained withion the Okanogan River floodplain. ; %: Provide access to Aeneas Creek for juvenile and adults | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 40 | 40 | 40 | 42 | 40 | 45 | High: How much of the lower section will be treated???? Small initial impact with larger benefit over time. ; Low: Minimal riparian vegetation between mouth and falls ; %: plant vegetation along stream channel to deter avian predation | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 2.00% | 70 | 70 | 70 | 80 | 75 | 80 | High: Secondary benefit of improving access ; %: Secondary benefit of improving access | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 3.00% | 50 | 50 | 50 | 70 | 50 | 70 | High: How much of the lower section will be treated???? Will it persist??? ; Low: Current condition is a series of ponds rather than stream habitat ; %: Consider removing beaver dams, reducing W/D ratio, bank stability | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 8.1: Water Quality: Temperature | 0.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 8.5: Water Quality: pH | 9.00% | 90 | 90 | 90 | 90 | 90 | 90 | High: Don't know the magnitude of the problem. Need to assess. ; Low: Water chemistry reduces disturbance and fills intersitial spaces but is a natural condition | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7D | Aeneas Creek | 9.2: Water Quantity: Decreased Water Quantity | 0.00% | 50 | 50 | 50 | 80 | 50 | 80 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 40 | 40 | 40 | 90 | 40 | 90 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 65 | 65 | 65 | 70 | 65 | 75 | Low: Under story missing in lower 1-mile however, most areas of major disturbance associated with ranching in upper watershed ; %: May collaborate with OCD on site specific location | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 2.00% | 70 | 70 | 70 | 70 | 70 | 70 | High: how much area would or could you treat???? ; Low: Most areas of major disturbance associated with ranching in upper watershed. : %: site specific to will ing landowners, will collaborate with OCD on site specific locations | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 3.00% | 80 | 80 | 80 | 80 | 80 | 80 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 35.00% | 40 | 40 | 40 | 50 | 40 | 50 | High: how much area would or could you treat???? ; Low: Based on OBMEP data and EDT values of 14% fines in spawning gravels??? ; %: site specific to willing landowners; will collaborate with OCD on site specific locations | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 8.1: Water Quality: Temperature | 5.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7E | Bonaparte Creek | 9.2: Water Quantity: Decreased Water Quantity | 40.00% | 60 | 60 | 60 | 75 | 60 | 75 | High: How much water can you get??? ; Low: Many threats to flows in upper watershed, occassionally lower 1-mile becomes intermittent ; %: would include alternative water sources, purchase, lease | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7F | Siwash Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 20.00% | 20 | 20 | 20 | 70 | 20 | 70 | High: What infrastructure will be removed??? The water is already covered under flow. ; Low: Additional stream length opened ; %: If water right is secured water, associated diversions will be removed | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7F | Siwash Creek | 4.1: Riparian Condition: Riparian Vegetation | 0.00% | 60 | 60 | 60 | 90 | 60 | 94 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7F | Siwash Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 2.00% | 60 | 60 | 60 | 70 | 60 | 70 | Low: Minimal structural complexity currently exists. ; %: Channel complexity would be nice after water and barriers are addressed | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7F | Siwash Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 3.00% | 50 | 50 | 50 | 60 | 50 | 60 | Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? ; %: Mostly a result of dewatering and lack for riparian veg. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7F | Siwash Creek | 8.1: Water Quality: Temperature | 0.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7F | Siwash Creek | 9.2: Water Quantity: Decreased Water Quantity | 75.00% | 20 | 20 | 20 | 70 | 20 | 70 | High: How much og the historic flows can you possibly restore? Are Perenial flows possible???? ; Low: At most this stream has discharge 2 month out of the year. : %: Study to be completed to determine water rights/use | 10/5/12: some possiblity by 2018 but nothing concrete enough to speculate about benefits yet<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 90 | 90 | 90 | 90 | 40 | 40 | | 2016: No actions anticipated through 2018, therefore no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 60 | 60 | 60 | 63 | 60 | 65 | High: Riparian area reduced due to agricultural land use. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 6.1: Channel Structure and Form: Bed and Channel Form | 2.00% | 80 | 80 | 80 | 80 | 80 | 80 | High: Channel can not migrate. ; %: Dyked, relocated, straightened, and reinforced | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 6.2: Channel Structure and Form: Instream Structural Complexity | 3.00% | 70 | 70 | 70 | 75 | 70 | 75 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 85 | 85 | 85 | 85 | 85 | 85 | Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 8.1: Water Quality: Temperature | 5.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7G | Lower Antoine Creek (Mouth to Rock chute) | 9.2: Water Quantity: Decreased Water Quantity | 50.00% | 33 | 33 | 33 | 95 | 33 | 95 | High: How much of an increase can you get???  ; Low: Currently flows make this habitat inaccessible to summer steelhead in most years. ; %: Increase irrigation efficiency in 2011 | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 1.1: Habitat Quantity: Anthropogenic Barriers | 71.00% | 61.5 | 61.5 | 61.5 | 80 | 80 | 80 | High: How to measure increased passage if no fish make it to the barrier? What about other barriers further upstream??? ; Low: unknown how this project will improve passage as during most years summer steelhead do not reach to site anyway??? ; %: Chute has been modified during 2011/12 to facilitate fish passage | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 4.1: Riparian Condition: Riparian Vegetation | 1.00% | 70 | 70 | 70 | 72 | 70 | 75 | Low: Most areas of major disturbance associated with farming and ranching in upper watershed. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 6.1: Channel Structure and Form: Bed and Channel Form | 2.00% | 80 | 80 | 80 | 85 | 80 | 85 | Low: Some sections of stream have been all but abliterated by past land use activities. Remaining habitat is in excellent condition. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 6.2: Channel Structure and Form: Instream Structural Complexity | 1.00% | 70 | 70 | 70 | 75 | 70 | 75 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 7.2: Sediment Conditions: Increased Sediment Quantity | 5.00% | 81.5 | 81.5 | 81.5 | 85 | 75 | 85 | Low: Based on OBMEP data and EDT values of 11% fines in spawning gravels??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 8.1: Water Quality: Temperature | 0.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7H | Upper Antoine Creek (Rocks to Fancher Dam) | 9.2: Water Quantity: Decreased Water Quantity | 20.00% | 40 | 40 | 40 | 95 | 50 | 95 | High: How much of an increase can you get???  ; Low: Currently flows make this habitat inaccessible to summer steelhead in most years. ; %: possibility of portion of stored water to be dedicated to instream flow | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7I | Wild Horse Spring Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 3.00% | 78.5 | 78.5 | 78.5 | 80 | 62 | 80 | High: Added roughly 20%?? to the existing habitat in 2011/2 leaving the potential for another 20% benefit by replacing the Highway 97 culvert???? (timeline???) ; Low: HWY 97 culvert is marginally passable by adults during high water and 100% barrier to upstream passage of juveniles. ; %: perched round cuvlert, replaced with a bridge in 2011/ replace a culvert in 2012 | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7I | Wild Horse Spring Creek | 4.1: Riparian Condition: Riparian Vegetation | 2.00% | 65 | 65 | 65 | 66 | 65 | 70 | High: How much of Accord's property can you change, small initial change could increase over time if change persists and trees grow??? ; Low: lower third of creek has little to no riparian buffer | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7I | Wild Horse Spring Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 5.00% | 80 | 80 | 80 | 85 | 80 | 85 | High: How much of stream will be impacted by this action? ; Low: Deep pools are lacking. ; %: possible installation of instream structures to create pool habitat for increased juvenile survival | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7I | Wild Horse Spring Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 10.00% | 70 | 70 | 70 | 75 | 70 | 75 | High: How much of accords property can you change, small initial change could increase over time if change persists??? ; Low: Based on OBMEP data and EDT values of 24% fines in spawning gravels. : | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7I | Wild Horse Spring Creek | 8.1: Water Quality: Temperature | 0.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7I | Wild Horse Spring Creek | 9.2: Water Quantity: Decreased Water Quantity | 80.00% | 50 | 50 | 50 | 60 | 50 | 60 | High: Can you make this stream perenial???? ; Low: In most years this stream becomes intermittant by late summer. ; %: Reviewing water augmentation analysis, with potential well development | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 4.1: Riparian Condition: Riparian Vegetation | 25.00% | 40 | 40 | 40 | 40 | 40 | 40 | Low: Intermittant sections have very limited riparian habitat. | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 5.00% | 20 | 20 | 20 | 50 | 20 | 50 | Low: Channel can not migrate along lower 1 mile. ; %: Dyked, relocated, straightened, and reinforced | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 3.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Lower 1mile and isolated areas above falls where riparian habitat has been lost. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 2.00% | 75 | 75 | 75 | 80 | 75 | 80 | Low: limited channel complexity in lower 1 mile. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 15.00% | 75 | 75 | 75 | 80 | 75 | 80 | Low: Based on OBMEP data and EDT values of 18% fines in spawning gravels??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 8.1: Water Quality: Temperature | 5.00% | 90 | 90 | 90 | 90 | 90 | 90 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7J | Tonasket Creek | 9.2: Water Quantity: Decreased Water Quantity | 45.00% | 25 | 25 | 25 | | 25 | 35 | High: Will this make stream perenial from mouth to falls? ; Low: 1/2 of stream is intermittant for most of the year and the remaining habitat is limited during low flow periods. ; %: may secure property with water (artesian well); study to determine amount of water needed to provide continuous flow | This Limiting Factor was somehow removed from Taurus database, and subsequently put back in on 8.18.16 by EWW.<br>2016: No actions anticipated by 2018, therefore, no change to low bookend. |
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 20.00% | 92 | 92 | 92 | 100 | 67 | 100 | High: Removal of the diversion would make all habitat accessible from the mouth to the falls???? Barrier completely removed during 13-15 period? ; Low: Diversion potential blocks access to 1/3 of available habitat. | 10/5/12: should move to 85-90% once the TU project is implemented, might be all SRFB/TRIB<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 4.1: Riparian Condition: Riparian Vegetation | 8.00% | 60 | 60 | 60 | 62 | 65 | 65 | Low: Large section of riparian habitat missing on Eder property. | 10/5/12: TU project will improve this as well, maybe another 1-2% by 2018 and 10% by 2033<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 8.00% | 70 | 70 | 70 | 80 | 75 | 80 | Low: Channel can not migrate along lower 1 mile. ; %: Dyked, relocated, straightened, and reinforced | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 6.1: Channel Structure and Form: Bed and Channel Form | 8.00% | 60 | 60 | 60 | 65 | 60 | 65 | High: How much area will this cover??? Small initial gain with increased benefits provided the action persists. : Low: Large section of riparian habitat missing on Eder property. | 2016: Project maintains existing benefit but no measureable improvement beyond baseline. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 6.00% | 60 | 60 | 60 | 65 | 60 | 65 | Low: Large section of riparian habitat missing on Eder property. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 10.00% | 70 | 70 | 70 | 75 | 70 | 75 | High: How much area will this cover??? Small initial gain with increased benefits provided the action persists. : Low: Based on OBMEP data and EDT values of 24% fines in spawning gravels. ; %: Installation of fencing during 2013 to limit livestock to hardened points for access | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 8.1: Water Quality: Temperature | 0.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS7K | Nine Mile Creek | 9.2: Water Quantity: Decreased Water Quantity | 40.00% | 92 | 92 | 92 | 100 | 80 | 100 | High: How much of an increase can you get??? All the water by 2015????? ; Low: Existing water diversion reduce instream flows by as much as 50%. ; %: Alternative water source (well) delivers water to agriculutral fields in lieu of surface diversion 2013 | 10/5/12: 2018 AND 2033 ESTIMATES CHANGED FROM 50. This was an error and should have been captured at the EP workshop.<br>2016: No actions anticipated by 2018, therefore no change to low bookend<br>Some of the potential benefit is likely to come from the diversions in Canada that might be fixed via non AA projects<br><br>There is also a 140 acre/ft increase from the TU project. The 2018 &2033 estimate could go to 80% with the CN project being the remaining 20%. |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 2.1: Injury and Mortality: Predation | 5.00% | 60 | 60 | 60 | 65 | 65 | 65 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 2.3: Injury and Mortality: Mechanical Injury | 4.00% | 98 | 98 | 98 | 100 | 85 | 100 | High: If all pump screens meet NOAA criteria. Number based on original EP table. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 3.2: Food: Food-Competition | 2.00% | 70 | 70 | 70 | 70 | 70 | 70 | Low: Tonasket Acclimation pond | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 4.1: Riparian Condition: Riparian Vegetation | 13.00% | 25 | 25 | 25 | 30 | 25 | 40 | | 2016: While 0.75 stream miles will be treated, there is no measureable benefit to 2018. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 6.00% | 40 | 40 | 40 | 65 | 40 | 65 | High: Old values=LB-90%, 2018&2033=95% which represents a 5% change??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 10.00% | 40 | 40 | 40 | 50 | 40 | 50 | High: Old values=LB-90%, 2018&2033=95% which represents a 5% change??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 6.1: Channel Structure and Form: Bed and Channel Form | 12.00% | 40 | 40 | 40 | 50 | 40 | 50 | High: Old values=LB-65%, 2018=75% & 2033=80% which represents a 10% to 15% change??? ; %: Function of lost riparian function | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 6.2: Channel Structure and Form: Instream Structural Complexity | 3.00% | 70 | 70 | 70 | 75 | 70 | 75 | High: Old values=LB-70%, 2018=75% & 2033=80% which represents a 5% to 10% change??? Less sure of the 2033 value. (will this persist???) ; %: Pilot project evaluation to increase sediment transport at localized site | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 7.2: Sediment Conditions: Increased Sediment Quantity | 30.00% | 55 | 55 | 57.7 | 60 | 55 | 60 | High: Values from old EP tables-these seem high to me especially the 2033 values. ; Low: (80% based on OBMEP data and EDT values of 14% fines in spawning gravels???) | 2016: One project will treat 1.5 mile on one bank. Prorated by 30% for effectiveness to 2018 = 0.45 stream miles treated. Relative to the 16.48 steelhead bearing stream miles in this Assessment Unit = 2.7% improvement. EWW 8.18.16 |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 8.1: Water Quality: Temperature | 15.00% | 35 | 35 | 35 | 35 | 35 | 35 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8A | Okanogan River 06 (Siwash to Confluence with Similkameen) | 9.2: Water Quantity: Decreased Water Quantity | 0.00% | 95 | 95 | 95 | 96 | 95 | 96 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 2.1: Injury and Mortality: Predation | 6.00% | 60 | 60 | 60 | 70 | 60 | 70 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 3.2: Food: Food-Competition | 5.00% | 75 | 75 | 75 | 75 | 75 | 75 | Low: Summer steelhead scatter plants into this area. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 4.1: Riparian Condition: Riparian Vegetation | 8.00% | 50 | 50 | 50 | 52 | 50 | 55 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15.00% | 60 | 60 | 60 | 70 | 60 | 70 | High: Old values=LB-70%, 2018 & 2033=80% which represents a 10% change??? ; % Confinement from roads and railroads | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 6.1: Channel Structure and Form: Bed and Channel Form | 12.00% | 85 | 85 | 85 | 85 | 85 | 85 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 6.2: Channel Structure and Form: Instream Structural Complexity | 6.00% | 70 | 70 | 70 | 75 | 70 | 75 | High: Old values=LB-70%, 2018 & 2033=75% which represents a 10% change??? 70 to 80 for cross channel during the 10-12 period and another 5% for the Eyhot channel in the 13-15 period. ; Low: only 1 log jam of any consequence exists within this reach although several LWD collection sites do exist. ; %: Install instream structure in side channel at EYHOTT Island to prevent dewatering of maintstem channel | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 7.2: Sediment Conditions: Increased Sediment Quantity | 8.00% | 80 | 80 | 80 | 80 | 80 | 80 | Low: Based on OBMEP data and EDT values of 14% fines in spawning gravels??? | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 8.1: Water Quality: Temperature | 40.00% | 35 | 35 | 35 | 40 | 35 | 40 | High: Old values=LB-21%, 2018=67% & 2033=70% which represents a 46% to 49% change??? ; %: evaluation of ground water input at Driscoll Island | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Okanogan River | ORS8B | Okanogan River 07 (Confluence with Similkameen to Z. Dam) | 9.2: Water Quantity: Decreased Water Quantity | 0.00% | 95 | 95 | 95 | 96 | 95 | 96 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Okanogan River | ORS9A | Johnson Creek | 1.1: Habitat Quantity: Anthropogenic Barriers | 50.00% | 20 | 20 | 45 | | | | Added during June 2016 Lookforward | 2016: Edwards St Culvert and Gabion Removal to are expected to open 3.7 upstream miles. Duck Lake Diversion is expected to open 6.2 upstream miles. Other partial barriers/impediments exist; these project will fix 3 out of 15 existing barriers. Prorated to account for improvement to 2018 (25%) = 2.475 stream miles opened. Relative to the 9.9 steelhead bearing stream miles in the Assessment Unit (EDT), there will be a 25% improvement. EWW 8.17.16. |
| Upper Columbia Steelhead | Okanogan River | ORS9A | Johnson Creek | 6.2: Channel Structure and Form: Instream Structural Complexity | 20.00% | 67 | 67 | 67 | | | | Added during June 2016 Lookforward meeting | 2016: No actions are anticipated through 2018 |
| Upper Columbia Steelhead | Okanogan River | ORS9A | Johnson Creek | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 67 | 67 | 67 | | | | Added during June 2016 Lookforward meeting | 2016: No actions are anticipated through 2018 |
| Upper Columbia Steelhead | Okanogan River | ORS9A | Johnson Creek | 9.2: Water Quantity: Decreased Water Quantity | 10.00% | 39 | 39 | 50 | | | | Added during June 2016 Lookforward meeting | 2016: Expert Panel writes "Average winter stream flows are around 1 CFS so adding 1-2 CFS would vastly improve overwinter conditions. During 25% of the year would improve survival benefits by up to 50%. Existing EDT analysis indicates flow conditions are functioning at 79%."<br>The Expert Panel determined there will be 11% improvement by 2018. EWW 8.17.16 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES1 | Chiwawa | 1.1: Habitat Quantity: Anthropogenic Barriers | 10.00% | 98 | 98 | 98 | 99 | 98 | 99 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES1 | Chiwawa | 3.1: Food: Altered Primary Productivity | 60.00% | 50 | 50 | 50 | 75 | 50 | 80 | Not a lot of data. The gap between the low and high bookends reflects an assumed improvement(?) | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES1 | Chiwawa | 4.1: Riparian Condition: Riparian Vegetation | 15.00% | 90 | 90 | 90 | 92 | 90 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES1 | Chiwawa | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 15.00% | 95 | 95 | 95 | 97 | 95 | 97 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES1 | Chiwawa | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 93 | 93 | 93 | 94 | 93 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES1 | Chiwawa | 7.2: Sediment Conditions: Increased Sediment Quantity | 0.00% | 29 | 29 | 29 | 29 | 29 | 29 | REMOVE THIS LF | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 1.1: Habitat Quantity: Anthropogenic Barriers | 8.00% | 99.4 | 99.4 | 99.4 | 95 | 85 | 95 | Mainstem Chumstick is close, but barriers on tributaries and Merry Canyon<br>95% high bookend considers smaller tribs (eagle cr, etc.) steelhead spawning > chinook, but distribution similar for juvenile rearing | 3 barriers provide 1.5 mi access, 4th barrier improves partial barrier<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 4.1: Riparian Condition: Riparian Vegetation | 14.00% | 60.1 | 60.1 | 60.1 | 65 | 60 | 80 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 5.00% | 55 | 55 | 55 | 60 | 55 | 60 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 6.2: Channel Structure and Form: Instream Structural Complexity | 5.00% | 55 | 55 | 55 | 60 | 55 | 60 | bookend values are a remnant from the 2009 Workshop values and really don't apply; LF weight = 0% | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 7.2: Sediment Conditions: Increased Sediment Quantity | 20.00% | 60 | 60 | 60 | 75 | 60 | 75 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 8.1: Water Quality: Temperature | 20.00% | 75.1 | 75.1 | 75.1 | 77 | 75 | 85 | Reflects growth of Populus species, but not reconnection of floodplain, etc. | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES2 | Chumstick | 9.2: Water Quantity: Decreased Water Quantity | 28.00% | 52 | 52 | 52 | 90 | 50 | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES3 | Icicle | 1.1: Habitat Quantity: Anthropogenic Barriers | 35.00% | 70 | 70 | 70 | 90 | 90 | 90 | Look at relative AU weight for Icicle - evidence no historic passage of adult chinook above boulder field | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES3 | Icicle | 2.3: Injury and Mortality: Mechanical Injury | 5.00% | 50 | 50 | 50 | 90 | 50 | 90 | Reflects screening of 2 out of four diversions. Would still be some mechanical injury associated with irrigation. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES3 | Icicle | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 75 | 75 | 75 | 77 | 75 | 80 | Averages conditions across Icicle (Lower is much worse than Upper) | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES3 | Icicle | 6.2: Channel Structure and Form: Instream Structural Complexity | 15.00% | 21 | 21 | 21 | 21 | 21 | 21 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES3 | Icicle | 7.2: Sediment Conditions: Increased Sediment Quantity | 10.00% | 70 | 70 | 70 | 75 | 70 | 76 | Conditions here improving naturally over time. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES3 | Icicle | 9.2: Water Quantity: Decreased Water Quantity | 25.00% | 55 | 55 | 55 | 65 | 55 | 65 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES4 | Little Wenatchee | 3.1: Food: Altered Primary Productivity | 25.00% | 55 | 55 | 55 | 85 | 55 | 90 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES4 | Little Wenatchee | 4.1: Riparian Condition: Riparian Vegetation | 20.00% | 85 | 85 | 85 | 85 | 85 | 90 | Action is to allow natural improvements | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES4 | Little Wenatchee | 5.2: Peripheral and Transitional Habitats: Floodplain Condition | 30.00% | 90 | 90 | 90 | 95 | 90 | 95 | Berm at the gravel pits | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES4 | Little Wenatchee | 6.2: Channel Structure and Form: Instream Structural Complexity | 0.00% | 97 | 97 | 97 | 98 | 97 | 99 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES4 | Little Wenatchee | 7.2: Sediment Conditions: Increased Sediment Quantity | 25.00% | 75 | 75 | 75 | 85 | 75 | 90 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 98 | 98 | 98 | 99 | 98 | 99 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 45 | 45 | 45 | 45 | 45 | 50 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 25.00% | 65.5 | 65.5 | 65.5 | 80 | 66 | 80 | | benefits estimates considers Lower Wenatchee instream flow project dam removal<br>2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 6.1: Channel Structure and Form: Bed and Channel Form | 20.00% | 60 | 60 | 60 | 65 | 60 | 65 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 6.2: Channel Structure and Form: Instream Structural Complexity | 10.00% | 60 | 60 | 60 | 65 | 60.1 | 70 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 8.1: Water Quality: Temperature | 15.00% | 65.1 | 65.1 | 65.1 | 70 | 65 | 70 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES5 | Lower Wenatchee | 9.2: Water Quantity: Decreased Water Quantity | 20.00% | 55.2 | 55.2 | 55.2 | 65 | 52 | 65 | | summer flow benefits greater for steelhead<br>2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 1.1: Habitat Quantity: Anthropogenic Barriers | 10.00% | 82 | 82 | 82 | 85 | 82 | 85 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 60 | 60 | 60 | 65 | 60 | 70 | Most projects should be delayed until flow and water quality are addressed; Japanese knotweek removal; Restoration opportunistically between Cashmere and the USFS boundary. | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 15.00% | 25 | 25 | 25 | 25 | 25 | 25 | Assess and reduce road impactsâ€¦. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 6.1: Channel Structure and Form: Bed and Channel Form | 10.00% | 40 | 40 | 40 | 45 | 40 | 45 | Lower 6 miles + FS Road | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 6.2: Channel Structure and Form: Instream Structural Complexity | 15.00% | 50 | 50 | 50 | 55 | 50 | 55 | Worth adding complexity at the price of riparian?. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 7.2: Sediment Conditions: Increased Sediment Quantity | 10.00% | 40 | 40 | 40 | 45 | 40 | 50 | Assess and reduce road impactsâ€¦. | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 8.1: Water Quality: Temperature | 10.00% | 35 | 35 | 35 | 45 | 35 | 45 | Mostly a product of flow  Esp. the lower 4 miles | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES6 | Mission | 9.2: Water Quantity: Decreased Water Quantity | 20.00% | 30 | 30 | 30 | 60 | 30 | 60 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 93 | 93 | 93 | 98 | 93 | 98 | | 2016: No actions, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 3.1: Food: Altered Primary Productivity | 10.00% | 60 | 60 | 60 | 80 | 60 | 85 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 50.03 | 50.03 | 50.06 | 55 | 52 | 60 | Includes recruitment of LWM | 2016: One project will treat .59 stream miles. But prorated to reflect progress by 2018 (1%), the realized improvement is over 0.0059 stream miles. Relative to the 20.8 steelhead bearing stream miles in the Assessment Unit, there will be a 0.03% improvement. EWW 8.18.16 |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 25.00% | 73 | 73 | 74.6 | 80 | 80 | 80 | Increase LWD complexes; reconnect side channel habitat; 1.1, 1.2, and 1.3 scored together | Coulter Ck, Lower White Pine, NI, & Upper White Pine assumed to achieve the 80% high bookend<br>2016: Two projects will treat 0.169 stream miles and improvements will be fully realized by 2018. Relative to the 10.7 connected and disconnected side channel miles in the Assessment Unit, there will be a 1.6% improvement. EWW 8.18.16 |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 6.1: Channel Structure and Form: Bed and Channel Form | 20.00% | 61.3 | 63 | 63.5 | 65 | 63 | 65 | | 2016: One project will fully treat 0.45 stream miles. Relative to the 20.8 steelhead bearing stream miles in the Assessment Unit, there will be a 2.2% improvement. EWW 8.18.16 |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 6.2: Channel Structure and Form: Instream Structural Complexity | 20.00% | 52.5 | 54 | 56.3 | 55 | 58 | 60 | | 2016:Two projects will fully treat 0.78 stream miles. Relative to the 20.8 steelhead bearing stream miles in the Assessment Unit, there will be a 3.8% improvement. EWw 8.18.16 |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 7.2: Sediment Conditions: Increased Sediment Quantity | 15.00% | 65 | 65 | 65 | 70 | 65 | 75 | May be short-term increases in sediment from opening up side channels. Increased sediment in Lower Nason | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES7 | Nason | 8.1: Water Quality: Temperature | 0.00% | 80 | 80 | 80 | 80 | 80 | 80 | | 2016: No actions, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 1.1: Habitat Quantity: Anthropogenic Barriers | 5.00% | 70.1 | 70.1 | 70.1 | 85 | 70 | 85 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 4.1: Riparian Condition: Riparian Vegetation | 10.00% | 60 | 60 | 60 | 65 | 60 | 70 | | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 20.00% | 26.2 | 26.2 | 26.2 | 30 | 26 | 30 | | estimate includes Peshastin RM 0.8 Project benefits<br>2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 6.1: Channel Structure and Form: Bed and Channel Form | 15.00% | 35 | 35 | 35 | 50 | 35 | 50 | Bank hardening and incision all along the orchards | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 6.2: Channel Structure and Form: Instream Structural Complexity | 15.00% | 55.4 | 55.4 | 55.4 | 75 | 56 | 75 | | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 8.1: Water Quality: Temperature | 0.00% | 98 | 98 | 98 | 99 | 98 | 99 | | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES8 | Peshastin | 9.2: Water Quantity: Decreased Water Quantity | 35.00% | 20 | 20 | 20 | 80 | 20 | 80 | | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES9A | Middle Wenatchee | 1.1: Habitat Quantity: Anthropogenic Barriers | 50.00% | 95 | 95 | 95 | 95 | 95 | 95 | | 2016: No actions, therefore, no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES9A | Middle Wenatchee | 6.1: Channel Structure and Form: Bed and Channel Form | 50.00% | 85 | 85 | 85 | 85 | 85 | 85 | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES9B | Upper Wenatchee | 1.1: Habitat Quantity: Anthropogenic Barriers | 0.00% | 95 | 95 | 95 | 98 | 95 | 98 | | 2016: No actions, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES9B | Upper Wenatchee | 4.1: Riparian Condition: Riparian Vegetation | 33.00% | 80.01 | 80.01 | 80.01 | 82 | 81 | 85 | | 2016: No action, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES9B | Upper Wenatchee | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 34.00% | 70.3 | 70.3 | 75.9 | 90 | 85 | 90 | | Based on Reach Assessment projects would address everything in this reach except private lands<br>2016: One project treated 0.2 miles of side channel out of 3.55 miles of side channels in assessment unit. Therefore the improvement will be 5.6%. EWW 8.18.16 |
| Upper Columbia Steelhead | Wenatchee River | WES9B | Upper Wenatchee | 6.2: Channel Structure and Form: Instream Structural Complexity | 33.00% | 60.6 | 60.6 | 60.6 | 80 | 70 | 85 | | Estimate based on projects identified under LF 5.1 Side Channels that should have some effect on instream complexity; social constraints for long term<br>2016: No actions, therefore no change to low bookend<br>2016: Side channels not included in estimate considerations for THIS limiting factor. No actions, therefore, no change to low bookend. |
| Upper Columbia Steelhead | Wenatchee River | WES10 | White | 3.1: Food: Altered Primary Productivity | 20.00% | 70 | 70 | 70 | 75 | 70 | 75 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES10 | White | 4.1: Riparian Condition: Riparian Vegetation | 25.00% | 85 | 85 | 85 | 90 | 85 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |
| Upper Columbia Steelhead | Wenatchee River | WES10 | White | 5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions | 25.00% | 90 | 90 | 90 | 95 | 90 | 95 | | 2016: No actions anticipated by 2018, 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Upper Columbia Steelhead | Wenatchee River | WES10 | White | 6.2: Channel Structure and Form: Instream Structural Complexity | 30.00% | 93.7 | 93.7 | 93.7 | 90 | 87 | 95 | | 2016: No actions anticipated by 2018, therefore no change to low bookend |