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

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 Spring Chinook	Entiat River	ERC1	Lower Entiat	2.3: Injury and Mortality: Mechanical Injury	5.00%	80	80	80	100	95	100		2012 EP: 2 ARRA, 3 Ecology, 3 Below Keystone/HD-KW consolidation screens were completed in the 09-12 cycle, but are evaluated here because there was no screen LF in the 09-12 cycle. / 2015 LB EP: No actions, no change. EP moved one action that was not completed, Roaring Creek screen(s), to the LF. 0% uplift. -MAH2.25.16
Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	3.1: Food: Altered Primary Productivity	5.00%	40	40	40	50	40	50		2012 LF EP: Nutrient project scoping underway- potential benefits tbd in 2015 look back./ 2015 LB EP: No Actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	4.1: Riparian Condition: Riparian Vegetation	15.00%	25	25	25.1	30	25.6	35		2012 LF EP: Planting planned by CCD- benefits tbd. / 2015 LB EP: Riparian planting too immature to uplift at this time. 0% improvement anticipated in 2018, but 0.4% improvement expected in 2033. -MAH.2.25.2016 and edited by EWL 3.16.16 Post-Lookback meeting, Yakama Nation added one additional project that resulted in 0.014 stream miles effectively treated (by 2018) and 0.105 stream miles effectively treated (by 2033). Relative to the 16.8 steelhead bearing stream miles in the assessment unit, there will be a 0.1% improvement by 2018 and a 0.6% improvement by 2033. EWW 7.27.16
Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	0.00%	10	10	11.8	15	10	15		2012 EP: 0% LF weight - therefore, side channels are considered under LF 6.2 instream complexity. / 2015 LB EP: Determined this Limiting Factor should have weight, and the 0% is a data-entry error-MAH.2.25.2016. According to the Expert Panel, this limiting factor should be 15% . Four projects treated 0.37 side channel miles, but were adjusted to represent effectiveness to 2018 and 2033, respectively. Thus, the realized improvement to 2018 was across 0.32 side channel miles and also 0.32 miles in 2033. Relative to the 16.8 side channel miles in the Assessment Unit (from Tributary Assessment and Reach Assessment: 2063 ft. of side channel per mile (up to hatchery at river mile 7.2, but Assessment Unit goes up to Moraine, upstream of hatchery is more confined), the improvement is 1.8% (0.32/16.8*100) in both 2018 and 2033. EWL 3.18.16

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Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	5.2: Peripheral and Transitional Habitats: Floodplain Condition	15.00%	80	80	80.2	85	81	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	2015: The Expert Panel initially discussed counting side channel improvements in this limiting factor Assessment, but ultimately decided to only use those parameters in consideration for limiting factor 5.1 improvements. Ultimately, the benefits from one project were considered - a levee removal action for floodplain access. The 0.04 miles treated was adjusted for projected improvement in 2018 and 2033, respectively (both were the same in this case). Thus the realized river miles improved was 0.032. Relative to the 16.8 Chinook bearing river miles in the Assessment Unit (from Streamnet), improvement for this limiting factor = 0.2% (0.032/16.8*100). EWL 3.15.16
Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	70	70	70.4	72	71	72	Although there may not be a lot of opportunity for making changes, it is still high priority	2015: While the Expert Panel recognizes that it's difficult to affect bed and channel form in this area, 4 projects were assessed for limiting factor 6.1. The Expert Panel considered measured lengths of treated areas, then prorated stream miles treated to reflect how much each project action addressed this limiting factor, and taking into account whether wood was in active channel. The don't expect to see much pool depth change because of large substrates, adjustments were made accordingly. Estimates were projected both to 2018 and to 2033. The 1.38 stream miles treated were assessed to have realized impact to 0.069 river miles by 2018 and 0.138 river miles by 2033. Relative to the 16.8 Chinook river miles in the Assessment Unit (based on Streamnet database), the improvement is expected to be 0.4% by 2018 and 0.8% by 2033. EWL 3.10.16

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Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	25	25	31.8	50	35	70	This LF includes side channels	2012: 7 total projects from Entiat RA. Also include these 3 projects that were not in the 2012 look forward project list but were brought forward at the May 2012 EP workshop: - 0.8-2.3 boulder cluster - Foreman side channel - Entiat fish hatchery All 7 projects include some LWD, ELJs - based on L Entiat RA All 7 projects represent about 1/2 of opportunities 2015:Pool formation was considered in limiting factor 6.1, and not here for limiting factor 6.2. The Expert Panel considered 4 projects and adjusted the stream miles treated to reflect the anticipated improvement realized in 2018 and 2033 (respectively). The Expert Panel was conscientious to keep in mind the limits of possibilities within the treated areas given the boulder sizes, which limit how much channel structure and form can be changed in this Assessment Unit. Relative to the 16.8 Chinook bearing stream miles in the Assessment Unit (from Streamnet data layer), the improvement in both 2018 and in 2033 is 6.8%. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	23	23	23	50	23	50		2012: effects of actions for other LFs can affect change in sediment HF tbd in 2015 2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC1	Lower Entiat	9.2: Water Quantity: Decreased Water Quantity	10.00%	50	50	50	55	50	55		2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC2	Mad River	1.1: Habitat Quantity: Anthropogenic Barriers	20.00%	98	98	98	100	100	100		2015 LB EP: Actions were above the known extent of Chinook distribution. Therefore, no uplift. -MAH.2.25.16
Upper Columbia Spring Chinook	Entiat River	ERC2	Mad River	3.1: Food: Altered Primary Productivity	20.00%	40	40	40	50	40	50		2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16

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Upper Columbia Spring Chinook	Entiat River	ERC2	Mad River	4.1: Riparian Condition: Riparian Vegetation	20.00%	70	70	70	75	70	80		2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC2	Mad River	6.1: Channel Structure and Form: Bed and Channel Form	20.00%	90	90	90	92	90	92		2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC2	Mad River	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%	91	91	91	97	91	99		2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC2	Mad River	7.2: Sediment Conditions: Increased Sediment Quantity	20.00%	23	23	23	50	23	50	coarser bed material than lower Ent; road decommissioning could have high impact on sediment loading	2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore there is no change from the low bookend. EWL 3.10.16
Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95	95	95	100	95	100		2015 LB EP: No actions, no change. -MAH.2.25.16
Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	3.1: Food: Altered Primary Productivity	10.00%	40	40	40	50	40	55		2015 LB EP: No actions, no change. -MAH.2.25.16
Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	4.1: Riparian Condition: Riparian Vegetation	15.00%	60	60	60.2	65	64	70		2015: Two projects were considered though a third project (3D construction) was considered and removed because in the end it was decided that project removed vegetation instead of added it. For the two projects remaining, the Expert Panel adjusted the miles treawted (0.45) based on vegetation growth in period between project initiation and 2018 and 2033, respectively. This yielded improved stream miles of 0.027 and 0.135, respectively. Relative to the 11.6 chinook bearing stream miles in the Assessment Unit (from Streamnet), improvements to riparian condition is 0.2% in 2018 (0.027/11.6*100) and 1.2% (0.135/11.6*100), respectively. EWL 3.20.16

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Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	5.2: Peripheral and Transitional Habitats: Floodplain Condition	35.00%	60	68	68.2	70	68.2	70		2015: Miles of treated stream was measured using post-project aerial imagery, then those river miles were adjusted based on portion of PFC before and after each project. Side channel elements were considered in this limiting factor because limiting factor 5.1 was not previously identified for this AU. The 3D channel was already functional, but the entrance is now locked, so the value of the project was adjusted lower than the others. Extent and duration of inundation for the Dillwater jam has been measured. The 0.76 river miles treated were adjusted for projected improvement in 2018 (0.496) and 2033 (0.496). Relative to the Chinook bearing stream miles in the Assessment Unit (=11.6; from Streamnet), the actions have resulted in a 4.3% improvement (0.496/11.6*100) in both years. EWL 3.11.16 During the June, 2016 lookforward meeting, the Expert Panel concurred with Yakama Nation's suggestion to increase the proration value of the 3-D project from 15% to 100%. This change increased the stream miles effectively treated by 2018 and 2033 to 0.95. Relative to the 11.6 chinook bearing stream miles in the assessment unit (=11.6), there will be a 8.2% improvement in both 2018 and 2033. EWW 7.27.16
Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	6.1: Channel Structure and Form: Bed and Channel Form	5.00%	90	90	93.4	99	97	99		2012: includes Dillwater (described in LF 6.2) lower Tyee levee removal/3C would provide remainder of change 2015:Miles of treated stream was measured using post-project aerial imagery, then those river miles were adjusted based on PFC before and after each project. The 0.79 river miles treated were adjusted for projected improvement in 2018 (0.395) and 2033 (0.395). Relative to the Chinook bearing stream miles in the Assessment Unit (=11.6; from Streamnet), the actions have resulted in a 3.4% improvement (0.395/11.6*100). EWL 3.11.16

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Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	25	35	40.4	50	40.4	60		2012: remaining change to high bookends attributed to 3C 2015:Miles of treated stream was measured using post-project aerial imagery, then those river miles were adjusted based on PFC before and after each project. All were high intensity treatments regarding wood loading density, so rated at 100%. Thus 1.55 river miles treated were adjusted for projected improvement in 2018 (1.55) and 2033 (1.55). Relative to the Chinook bearing stream miles in the Assessment Unit (=11.6; from Streamnet), the actions have resulted in a 13.4% improvement (1.55/11.6*100) in both years. Expert Panel recognized that some large woody debris recruitment is expected, but some will move out too. EWL 3.20.16 During the June, 2016 lookforward meeting, the Expert Panel concurred with Yakama Nation's suggestion to increase the proration value of the 3-D project to 80%. This change increased the stream miles effectively treated by 2018 and 2033 to 1.79. Relative to the 11.6 chinook bearing stream miles in the assessment unit (=11.6), there will be a 15.4% improvement in both 2018 and 2033. EWW 7.27.16
Upper Columbia Spring Chinook	Entiat River	ERC3A	Middle Entiat	7.2: Sediment Conditions: Increased Sediment Quantity	5.00%	75	75	75	82	75	85		2012: possible benefits from riparian projects tbd USFS road decommissioning affects this LF 2015: There were no action undertaken during the 2012-2015 time period to address this limiting factor, therefore there was no change from the low bookend. Furthermore, the Expert Panel wondered if fine sediments are even a problem in this Assessment Unit. EWS 3.11.16
Upper Columbia Spring Chinook	Entiat River	ERC3B	Upper Middle Entiat	1.1: Habitat Quantity: Anthropogenic Barriers	0.00%	93	93	93	99		99		2016: No actions, therefore no change to low bookend.
Upper Columbia Spring Chinook	Entiat River	ERC3B	Upper Middle Entiat	3.1: Food: Altered Primary Productivity	45.00%	40	40	40	50	40	55		2016: No actions, therefore no change to low bookend.
Upper Columbia Spring Chinook	Entiat River	ERC3B	Upper Middle Entiat	4.1: Riparian Condition: Riparian Vegetation	0.00%	80	80	80	85		90		2016: No actions, therefore no change to low bookend.

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Upper Columbia Spring Chinook	Entiat River	ERC3B	Upper Middle Entiat	6.2: Channel Structure and Form: Instream Structural Complexity	55.00%	80	80	80	90	80	90	Do not expect increased benefit after 2018 from added LWM	2016: No actions, therefore no change to low bookend.
Upper Columbia Spring Chinook	Entiat River	ERC3B	Upper Middle Entiat	7.2: Sediment Conditions: Increased Sediment Quantity	0.00%	23	23	23	30		30		2016: No actions, therefore no change to low bookend.
Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	77	90	95.6	90	90	90	Cambell diversion	2015 LB EP: 2 actions, both partial barriers. Panel believes there are still barriers in the AU (Frazier?), and the uplift should not go to 100%. There were 6.4 miles total improved access (2.8 miles*50% + 3.6miles*10%) = 1.76mi / 9.45 total miles = 18.6% uplift. -MAH2.25.16
Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	2.3: Injury and Mortality: Mechanical Injury	5.00%	80	80	82.7	95	90	95	Are being addressed	2012 EP: Replace 4 brush screens w/ drum screens + Battie = 5 screens. / 2015 LB EP: There are 5 screens that need to be replaced. The panel considered that replacing all 5 screens would result in a 15% uplift to the 95% high bookend. Since only one screen was replaced, that equals 1/5th of 15%, with 90% proration due to replacement instead of removal = 2.7% uplift. -MAH2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	4.1: Riparian Condition: Riparian Vegetation	20.00%	70	70	70.8	75	80	80	Good until you get to the WDFW property (if you are considering stream margin and not floodplain vegetation).	2012: Estimate based on enhancement of 32.65 riparian acres, 1.7 riparian mi, and 3.2 wetland acres 2015: Expert Panel discussed projects to reconcile database projects with what was known to have happened. Some project burned and were replanted, so these should only be counted once. Two projects treated 1.5 stream miles,but were adjusted by 5% to account for vegetative growth rates. Relative to the 9.45 Chinook bearing stream miles in the Assessment Unit (Panel used Steelhead Streamnet miles since Chinook Streamnet indicated 0 miles plus 0.25 miles in Fraser Creek), improvement to riparian condition = 0.8% (0.075/9.45*100). EWL 3.20.16

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Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	60	60	67.4	80	70	80		2012: Estimate based on 1.29 mi channel added of enhanced 2015: Two projects were accomplished between 2012 and 2015. One of them:Schoolhouse: created 11 pools, 12 engineered log jams, enhanced seep and a side channel, and dropped big cottonwoods in after fire. Treated length of stream was adjusted by % of PFC, treatment intensity, and time needed to see form changes (some scour seen already in Schoolhouse) to estimate the realized change in 2018 (0.7 stream miles for both projects). Considered over all Chinook bearing stream miles in the Assessment Unit (9.45 miles; Expert Panel used steelhead miles from Streamnet because 0 miles were indicated for Chinook. Also they added 0.25 miles from Fraser Creek), the relative improvement for this limiting factor = 7.4% (0.7/9.45*100). EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	60	60	74.3	80	75	80		2012: Estimate based on 6.2 miles improved complexity. 2015: Two projects were accomplished between 2012 and 2015. 12 log structures were spread out over 1 river mile. Fire-killed wood was cut and dropped in stream after fire to provide sediment traps. Treated length of stream (1.4 river miles) was adjusted by % of anticipated improvement through 2018 (100% in both projects). Considered over all Chinook bearing stream miles in the Assessment Unit (9.45 miles; Expert Panel used steelhead miles from Streamnet because 0 miles were indicated for Chinook. Also they added 0.25 miles from Fraser Creek), the relative improvement for this limiting factor = 14.8% (1.4/9.45*100). EWL 3.11.16. Based on Yakama Nation correction of total steelhead bearing stream miles in the assessment unit, the uplift was modified from 14.8 to 13.8%. EWW 6.23.16 6.23.16: Cottonwood falling included in Old schoolhouse. PRorated to 90%. Benefits changed to 14.3%. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	55	55	55	65	56	75		2012: Not enough project information to include Rd decommissioning in estimate - can be included in 2015 workshop as "look back" if appropriate 2015: No projects were undertaken during 2012-2015 to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16 .

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Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	8.1: Water Quality: Temperature	5.00%	40	40	43.5	55	45	55		2015: The benefit from flow increase provided by Upper Beaver Creek lease (18%) was adjusted to convert from flow to temperature effects for fish (25%) = 4.5% improvement (18*25). EWL 3.11.16 Benefits modified 6.23.16 as per EP. 14 instead of 18% benefit from flow, therefore improvement for LF 8.1 = 14*25=3.5%. EWW
Upper Columbia Spring Chinook	Methow River	MEC1	Beaver / Bear Creek	9.2: Water Quantity: Decreased Water Quantity	25.00%	60	60	73.9	80	75	80	Cambell diversion; maybe others (?)	2012: Estimate based on 550 ac-ft (2 cfs); 16.5 miles stream reach about 25% of total diversions 2015: Beaver Creek #123 late season instream flow was added (2.08 cfs) during Expert Panel meeting. Some is permanent trust (2013 to past 2018), some is leased. Total leased cfs, averaged over time provides 1.8 cfs. Relative to base flow (10 cfs; value provided by Expert Panel) the water input improves this limiting factor by 17.8% (1.8/10*100) . EWL 3.11.16 6.23.16: Yakama Nation brought to the table a discussion about the Thurlow diversion and because of lack of enforcement of the water right, the purchase of Upper Beaver Creek lease is not always fully realized. Recognize benefits upstream from flow, but then water is pulled out (more is being withdrawn than is allowed - WA Ecology enforcement problem), so benefit should be prorated based on miles actually affected, considering illegal withdrawal (mostly a problem for 1-2 critical months of the year). Counted benefit from Beatty RM 6.5 to Thurlow (5 miles of benefit) yielding 13.9% improvement. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC2	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: Yakama Nation thinks this limiting factor weight is too high, but panel noted that the limiting factor weights came from the recovery Biological Strategy. EWW 7.29.16	2015 LB EP: No actions, no change. -MAH.2.25.2016

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Upper Columbia Spring Chinook	Methow River	MEC2	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	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC2	Early Winters Creek	6.1: Channel Structure and Form: Bed and Channel Form	17.00%	90	90	90	95	90	95	From campground down has been incised.	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC2	Early Winters Creek	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%	75	75	75	93	93	93		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC2	Early Winters Creek	7.2: Sediment Conditions: Increased Sediment Quantity	25.00%	75	75	75	80	75	80		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC2	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	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4A	Gold Creek	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	95	95	95	100	95	100	May be a partial barrier but don't know for sure. No barriers on USFS	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4A	Gold Creek	4.1: Riparian Condition: Riparian Vegetation	10.00%	75	75	75	80	75.1	85	Riparian mostly functioning (for being in a canyon) - biggest problems in flats and road footprint	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4A	Gold Creek	5.2: Peripheral and Transitional Habitats: Floodplain Condition	20.00%	45	45	45	50	45	50	Not much floodplain naturally - not much could do.	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4A	Gold Creek	6.1: Channel Structure and Form: Bed and Channel Form	30.00%	70	70	70	75	70	80		2015 LB EP: No actions, no change. -MAH.2.25.2016

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Upper Columbia Spring Chinook	Methow River	MEC4A	Gold Creek	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	45	45	45	60	45.1	75		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4A	Gold Creek	9.2: Water Quantity: Decreased Water Quantity	5.00%	90	90	90	90.5	90.5	90.5	May be a partial barrier but don't know for sure. No barriers on USFS	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4B	Libby Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95	95	95	100	95	100		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4B	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.	No actions. No change. Comment entered RM 5/25/2016 per input from Yakama Nation 5/3/2016.
Upper Columbia Spring Chinook	Methow River	MEC4B	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	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4B	Libby Creek	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	45	45	45	60	45.1	75		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC4B	Libby Creek	9.2: Water Quantity: Decreased Water Quantity	10.00%	75	75	75	80	75.2	80	Diversions probably not migration barriers.	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	85	85	85	98	85	98		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	3.1: Food: Altered Primary Productivity	5.00%	75	75	75	85	75	85		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	4.1: Riparian Condition: Riparian Vegetation	15.00%	55	55	55.5	65	58	75	Riparian and floodplain combined in 09 EP, used lower chewuch values	Estimate assumes approx. 35 acres riparian improvement. Remaining effects from grazing, roads, recreation. In 2016 the Expert Panel was unable to provide an estimate of uplift without additional input from the Yakama Nation on project details and applicable habitat functions. On 5/3/2016 the Yakama Nation included additional project work in the calculation spreadsheet and adjusted the stream miles treated based on their project work. Based on this the Yakama Nation prorated the benefits projected to 2018 and assigned a 0.5% uplift. Comments entered and verified RM 5/24/2016. 6.23.16 buck forest fuels project removed from project list due to no action agency involvement, but there was no change to the uplift
Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	25.00%	55	57	66.5	70	57	70	Most sidechannels in the lower have been cutoff, filled, and developed	Unlisted future opportunities would provide majority of actions needed to reach high bookend. In 2016 the Expert Panel was unable to assign uplift without additional input from the Yakama Nation on project details and applicable habitat functions. The Expert Panel used a denominator of 9.8 miles per the Bureau of Reclamation Tributary/Reach Assessment GIS layer. The Yakama Nation wanted more information regarding the 9.8 mile denominator. Based on input from the Yakama Nation on 5/3/2016 the estimate of benefit was modified to include the Chewuch between RM 13 - 15.5. That altered the stream miles treated. Based on this the estimated uplift was 11.5. Comments entered RM 5/24/2016. 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

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Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	6.1: Channel Structure and Form: Bed and Channel Form	2.50%	75	77	77.1	90	77	90		Relocations in 8-mile or 20-mile would provide benefits (not Cub or Boulder - above barriers). In 2016 the Expert Panel was unable to estimate uplift without input from the Yakama Nation on project details and applicable habitat functions. On 5/3/2016 the Yakama Nation provided input on improvements to the tributaries and the mainstem that were determined to be "in good shape." Most habitat actions addressed LF 6.2. Based on calculation that included the Chewuch River between RM 10 and 13-15.5 that were included because of affects from apex structures on channel geometry the estimate of benefits was prorated at 100%. No Yakama Nation actions in side channels were included in the estimate of benefits for LF 6.1. The Yakama Nation would like this addressed during the look forward in June. Commented entered RM 5/24/2016. 6.23.16: Discussed at Lookforward meeting and reached concurrence, but the Yakama Nation used miles of 100% treatment rather than overall project length, which results in the same total if total project length were used with a lower proration. This differs from the calculation method used by the panel for non-Yakama Nation projects. Despite some concerns that this might create a perception of 100% treatment over the whole reach, the panel agreed to use this method for the Yakama Nation projects. EWW 7.29.16

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 Spring Chinook	Methow River	MEC5	Lower Chewuch	6.2: Channel Structure and Form: Instream Structural Complexity	15.00%	60	65	79.4	80	70	80		Estimate based on 5 treatment areas w/ total of abt. 8 stream miles improved complexity. In 2016 the Expert Panel determined that they could not estimate uplift without input from the Yakama Nation on project details and applicable habitat functions. Based on input from the Yakama Nation 5/3/2016 that included the Chewuch River between RM 11.75 and 13 (River Left, 2013 and River Right 2015) the proration on the uplift was split for the 1.25 miles of stream between the 2013 and 2015 actions. As per Yakama Nation, no side channels were considered in consideration. This needs to be addressed at the look forward meeting in June. Comments entered RM 5/24/2016. 6.23.16: discussed by full panel during EP lookforward. Side channels are not included in consideration. Seven projects treated 7.15 stream miles, but after prorating for effective treatment by 2018, 4.335 stream miles were treated. Relative to the 22.4 Chinook bearing stream miles in the assessment unit, there was a 19.4% improvement. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	7.2: Sediment Conditions: Increased Sediment Quantity	20.00%	50	50	50	52	50.3	55	High bookend assumes some riparian improvement	Beaver Project would slightly decrease road sediments. 2015 No actions. No change. Comment entered RM 5/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC5	Lower Chewuch	8.1: Water Quality: Temperature	2.50%	40	40	40	60	44	60		Estimate also considers projects under LF 4.1 Riparian and 6.2 Instream Complexity - Pete's Ck, 10-mile & 8-mile ranches (11.75-13+ and 13-15.5). 2015 No actions. No change. Comment entered RM 5/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC5	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 consider the Fulton pipe project included in Actions list. Changes from fall to spring diversion to refill Perrygin Lake improves conditions fo chinook/steelhead. Secure 10 of 40 cfs diverted 2015 No actions. No change. Comments entered RM 5/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC6A	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. / 2015 LB EP: No actions, no change. -MAH.2.25.2016

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 Spring Chinook	Methow River	MEC6A	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. / 2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC6A	Lower Methow	6.1: Channel Structure and Form: Bed and Channel Form	25.00%	80	80	80	81	81	81		2012 LF: Beaver actions are outside the anadromous zone; estimate based on Judd project. / 2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC6A	Lower Methow	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	75	75	75	80	76	80	lower methow 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)	2012: 10/4/12: Has not been assessed and so is an unknown - large wood sources from uspream and riparian areas is likley lower than historic conditions 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC6A	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€¦.. 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC6B	Black Canyon	1.1: Habitat Quantity: Anthropogenic Barriers	20.00%	90	90	90	100	90	100	1 culvert remaining (higher up)	2015 No actions. No change. Comments entered RM 5/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC6B	Black Canyon	4.1: Riparian Condition: Riparian Vegetation	0.00%	80	80	80	81	80	81		2015 No actions. No change. Comments entered RM 5/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC6B	Black Canyon	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%	93	93	93	93	93	93		2015 No actions. No change. Comments entered RM 5/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC6B	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.	2015 No actions. No change. Comments entered RM 3/24/2016.

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Upper Columbia Spring Chinook	Methow River	MEC6B	Black Canyon	9.2: Water Quantity: Decreased Water Quantity	35.00%	70	70	70	75	70.2	75		2015 No actions. No change. Comments entered RM 3/24/2016.
Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	60	60	60	95	95	95		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC7	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. 2015: No actions were undertaken during 2012-2015 to address this limiting factor, therefore if there were a low bookend, there would be no change. EWL 3.14.16
Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	3.1: Food: Altered Primary Productivity	8.00%	75	75	75	85	75	85		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	4.1: Riparian Condition: Riparian Vegetation	10.00%	60	64	64.3	64	75	75	Used lower twisp values, riparian and floodplain combined in 09 EP	2012: Estimate based on 43 acres planned riparian improvements. 2015: Two projects treated 0.85 stream miles and were adjusted based on planting maturity. Twisp Ponds plants are growing fast- a very successful project. Some plants are 20 ft. tall now. Twisp River Riparian protection 2014 weighted as 0% for now, pending tribal information. Thus, the total stream miles of realized treatment by 2018= 0.005. Relative to the 13.5 Chinook bearing stream miles in the Assessment Unit, there was a 0.04% improvement (0.005/13.5*100). EWL 3.20.16 6.23.16: Based on discussions with full Expert Panel, calculations changed. 0.796 stream miles treated/18.6 steelhead (not Chinook; to account for off-site benefits) bearing stream miles = 4.3% benefit. EWW 7.29.16

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Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	15.00%	50	50	51.7	60	60	60	(below Buttermilk Creek)	2012: 10% improvement estimate based on 0.97 miles side channel & wetland enhancement per Actions list plus MVID-West RM 4.6 project & Elbow Coulee Side Channel & Elbow Coulee Right projects. 2015: One project treated 0.3 miles of side channel. The Expert Panel anticipates the project to be 75% realized by 2018, therefore the treatment length was reduced to 0.225 side channel miles treated. Considered over all the side channel miles in the Assessment Unit (13.5; Streamnet), this project improved conditions for this limiting factor 1.7% (=0.225/13.5*100). EWL 3.14.16
Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	6.1: Channel Structure and Form: Bed and Channel Form	15.00%	50	50	50	60	51	60		2012: Bridge Ck beaver relocation estimate of 0.1%; 1% improvement estimate includes MVID-West RM 4.6 project 2016: No actions, therefore no change to low bookend.
Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	50	50	52.1	60	55	60	(below Buttermilk Creek)	2012: Estimate based on 3 stream miles & 20 acres improved complexity 2015: Three projects treated 0.32 miles of stream, which was then adjusted to reflect the anticipated realized improvement to instream complexity by 2018 (=0.16). Relative to all Chinook bearing stream miles in the Assessment Unit, there was a 1.2% improvement (0.16/13.5*100). EWL 3.14.16 6.23.16: benefits modified by Yakama nation= 0.8 stream miles treated, then prorated to =0.29/13.5=2.1%. Full panel concurrence during look forward meeting. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	8.1: Water Quality: Temperature	7.00%	25	25	25.5	40	30	40		2012: Estimate also includes major flow improvements from projects in 9.2 & 5.1 LF actions. 2015: Recognizing that increased flow increases temperature resiliency, the Expert Panel adjusted the 2.3% improvement to flow to represent the improvement in temperature by subjectively imposing a 5% improvement factor. Therefore, improvement to temperature resulted in 0.1% (2.3*5). EWL 3.20.16 June, 2016: The full panel tentatively settled on using Limiting Factor 9.2 uplift value, prorated 5% for a new improvement estimate = 0.5%. EWW 7.29.16

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Upper Columbia Spring Chinook	Methow River	MEC7	Lower Twisp	9.2: Water Quantity: Decreased Water Quantity	30.00%	40	40	42.3	75	67	75	EP CHANGED BOOKENDS FROM 60 TO 75 AT 6/28/12 WORKSHOP BASED ON NEW POTENTIAL	2012: Estimate based on 3400 ac-ft/yr (15 cfs of 33 cfs diverted almost 50% from 40 to 100 = 65%) Water transaction obtained thru TU for CBWTP. Poorman + Devaney also include screens. 2015: One permanent acquisition resulted in a savings of 1 cfs. Relative to the 43 cfs base flow (lowest mean daily base flow average 1974-2010; Twisp River USGS gauge), there is a 2.3% improvement in flow. EWL 3.20.16
Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	1.1: Habitat Quantity: Anthropogenic Barriers	2.00%	85	85	85	98	90	98		2012 LF EP: Total improved access from Bear Cr. & Barkley Projects = 1 mile. Remaining barriers on Bear Ck. would open access to habitat w/ low intrinsic potential. 2015 LB EP: The temporary Barkley project did not alleviate any significant passage barrier. The final removal of the diversion may have more impact. No uplift to LF1.1, but there is a benefit for injury/mortality from push up dam construction (LF2.3), based on current action. 0% uplift. -MAH2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	2.3: Injury and Mortality: Mechanical Injury	8.00%	80	80	81.5	95	95	95	LF added during 6/28/2012 workshop	2012 EP: No project listed, but estimate based on opportunity to eliminate heavy equipment maintenance of push-up dams & eliminate fish accessibility to intake at Barkley diversion. Collaboration among WDFW screen shop/TU/ Reclamation & YN. Projects listed would address all known issues. Other projects would improve from 95-100%. / 2015 LB EP: The temporary pump station Barkley project did not alleviate all injury/mortality from the channel, but the permanent change should alleviate all mortality and injury from stranding. Panel determined that, based on the 15% difference between the low bookend and high bookend (80-95%), the temporary project helped alleviate 10% of the remaining issues in this AU. Elimination of the Barkley Project should result in the remaining 13.5% uplift to reach 95% during the Look Forward. 1.5% uplift. -MAH2.25.2016

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Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	4.1: Riparian Condition: Riparian Vegetation	15.00%	48	48	48.9	50	55	55	Riparian and floodplain combined in 09 EP, 09 EP LB 45 increased to 48 in 2012 EP	2012: Estimates based on planned 75 acres riparian improved. 2015: Eight vegetation projects treated 3.03 stream miles, and recognizeing that vegetation takes time to grow, the Expert Panel adjusted those stream miles by attributing 1%/year benefit. Except for 1890s which had negative (net loss) effect on existing riparian vegetation, so no credit was given. Thus 0.0924 stream miles were effectively treated. Relative to the 25.2 Chinook bearing stream miles in the Assessment Unit, there was a 0.4% improvement (0.0924/25.2*100). EWL 3.20.16 June 2016: stream miles treated and prorations modified by full Expert Panel during Lookforward meeting. 3.7 stream miles treated. With prorations, 0.217 miles effectively treated by 2018. Relative to the 25.2 Chinook bearing stream miles in the assessment unit, there will be a 0.9% improvement. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	25.00%	55	55	63	70	68	70		2012: Estimate considers total of approx. 5 miles channel improvement Estimate includes projects shown under 4.1 Riparian LF - 3R, Barkley, WDFW Floodplain, Whitefish, (Sugar Levee, Witte Risley?) + projects listed under this 5.1 LF 2015: Four projects were evaluated and the Expert Panel determined that each would reach 100% of the realized change b 2018, therefore, the side channel stream miles treated were totaled = 1.46. Relative to the 20 side channel miles in the Assessment Unit (from Tributary Assessment Geodatabase), the projects resulted in a 7.3% improvement (1.46/20*100). EWL 3.14.16 6.23.16. During the lookfoward meeting, the full panel reviewed mileages and progrations for this limiting factor. Some treatment lengths were revised for a total treatment length of 1.59 stream miles (100% proration for all projects). Relative to the 20 miles of side channels in the assessment unit (BOR tributary assessment) there will be an 8% improvement. EWW 7.29.16

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Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	50	50	51.8	70	55	70	Focus of much of M2 work	2012: Estimate considers actions listed under LF4.1 & 5.1 except Silver. Silver can be added in 2015 workshop as look back actions if occur. 2015:Five projects treated 0.83 river miles, and those treated miles were adjusted to reflect action effectiveness by 2018 (=0.415 miles). Relative to the 25.2 miles of Chinook bearing stream miles in the Assessment Unit, there was a 1.6% improvement for this limiting factor (0.415/25.2*100). EWL 3.14.16 6.23.16 - Modified by yakama nation comments. Eagle Rocks project removed from consideration and treatment lengths and proration values modified. 1.2 stream miles treated, but after proration for PFC to 2018, 0.445 stream miles were effectively treated. Relative to the 25.2 Chinook bearing stream miles across the assessment unit, there will be a 1.8% improvement. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	6.2: Channel Structure and Form: Instream Structural Complexity	25.00%	50	50	54.2	70	60	70		2012: Estimate considers about 4.05 stream miles improved complexity, install of 118 structures (8 structres for Lewisia & 12 for Silver Reach). 2015: Seven projects treated 2.41 miles of stream and those miles were adjusted based on anticipated improvement by 2018. Most were 100%. Therefore, the total stream miles treated was 2.13. Relative to the 25.2 Chinook bearing stream miles in the Assessment Unit, there was a 8.6% improvement (2.16/25.2*100). EWL 3.14.16 50-60% treats 1/2 of reach covered by existing RA; remaining 60-70% to be treated by actions from the RA to be completed. 6.23.16: Several treatment lengths and prorations were adjusted by full panel for a total stream miles treated = 1.8 and with prorations, the stream miles effectively treated by 2018=1.055. Relative to the 25.2 Chinook bearing stream miles in the assessment unit, there will be a 4.2% improvement. EWW 7.29.16

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 Spring Chinook	Methow River	MEC8A	Middle Methow	8.1: Water Quality: Temperature	5.00%	75	77	77.2	85	77	85		2012 LF EP: Estimate also includes 4.1, 5.1, & 9.2 LF actions except Silver. Silver actions can be considered as part of 2015 workshop "look back". estimates. / Does not include Barkley or MVID - considers those actions indentified in RA as achieving 1/2 of potential - other 1/2 covered by next RA. 2015 Expert Panel discussed the difficulty quantifying aggregate effects on temperature, but several of the projects in this Assessment Unit (3R, Whitefish, and 1890s) have created thermal herogeneity and refuge, which increases fish survival. Three projects treated 1.16 stream miles and those miles were adjusted based on estimated thermal benefits, previous functional condition, and location in relation to where fish are known to be. Thus, 0.49 stream miles realized improvements. Relative to the 25.2 Chinook stream miles in the Assessment Unit, there was a 1.9% improvement to temperature (0.49/25.2*100). EWL 3.20.16 6.23.16: Modified by full EP; Treatment lengths and prorations adjusted for total treatment length = 1.4 stream miles, then prorated to represent improvements to 2018 = 0.55 stream miles. Relative to the 25.2 Chinook bearing stream miles in the assessment unit, there will be a 2.2% improvement. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC8A	Middle Methow	9.2: Water Quantity: Decreased Water Quantity	10.00%	75	75	75	85	75.2	85	This is look at the cumulative effect to this reach of water savings upstream.	2012: Estimate only includes consideration from Bear Creek project 100 af/yr metrics. Beavers in upstream areas have no effect on flow downstream . 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	85	85	85	85	85	85	Foghorn	2015 LB EP: No actions, no change. -MAH2.25.16
Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	3.1: Food: Altered Primary Productivity	5.00%	75	75	75	85	76	85		2012 LF: estimate based on Hancock nutrient treatment plan. / 2015 LB EP: No actions, no change. -MAH2.25.16

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Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	4.1: Riparian Condition: Riparian Vegetation	10.00%	60	60	60	62	60.2	65		2012 LF: Estimate based on WDW Fender Mill & Big Valley project described in LF 5.1. / 2015 LB EP: No actions, no change. -MAH2.25.16
Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	15.00%	65	65	68.4	80	80	80	progress from 80% bookend to 100% would be based on actions around hatchery & Winthrop	2012: estimate based on planned Fender Mill , Big Valley & Heath/Big Valley RIGHT projects (FWS w/ BPA cost share). 2015: One project restored 0.5 side channel miles, which will be fully realized by 2018 (100% adjustment for improvement factor). Relative to the 15.1 side channel miles in the Assessment Unit (from BOR tributary assessment project), the benefit of this project is 3.4% (0.5/15.1*100). EWL 3.15.16
Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	6.1: Channel Structure and Form: Bed and Channel Form	23.00%	65	65	65	75	70	75		2012 LF: Estimate based on WDFW Fender Mill, BIg Valley, & Heath/Big Valley RIGHT projects. / 2015 LB EP: No actions, no change. -MAH2.25.16
Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	6.2: Channel Structure and Form: Instream Structural Complexity	22.00%	65	65	65	75	70	75		2012 LF: Estimate based on Big Valley, Heath/BIg Valley RIGHT & WDFW Fender Mill projects. 2015: One project that treated 0.5 stream miles was considered fully effective by 2018 (100% adjustment for improvement factor). Relative to the 10.8 Chinook bearing stream miles in the Assessment Unit (Streamnet), the improvement for this limiting factor is 4.6% (0.5/10.8*100). EWL 3.15.16 6.23.16: No actions, therefore no change to low bookend. This was a change from the 2015 lookback meeting that was agreed upon by full expert panel. EWW 7.29.16
Upper Columbia Spring Chinook	Methow River	MEC8B	Upper-Middle Methow	9.2: Water Quantity: Decreased Water Quantity	20.00%	80	80	80	85	80	85	Foghorn	2012 LF: No effect unless beaver reintro occurs in Hancock. / 2015 LB EP: No actions, no change. -MAH2.25.16
Upper Columbia Spring Chinook	Methow River	MEC9	Upper Chewuch	4.1: Riparian Condition: Riparian Vegetation	10.00%	90	90	90	92	90	95	Early recovery from burning	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC9	Upper Chewuch	6.1: Channel Structure and Form: Bed and Channel Form	5.00%	90	90	90	93	90	95		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16

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Upper Columbia Spring Chinook	Methow River	MEC9	Upper Chewuch	6.2: Channel Structure and Form: Instream Structural Complexity	70.00%	80	80	80	85	80	90		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC9	Upper Chewuch	7.2: Sediment Conditions: Increased Sediment Quantity	15.00%	90	90	90	92	90	95	Sediment condition is mostly natural	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10A	Upper Methow	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	75	75	75	90	75	90		2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC10A	Upper Methow	3.1: Food: Altered Primary Productivity	5.00%	75	75	75	85	75	85	Water quality in 09 EP no values	2015 LB EP: No actions, no change. -MAH.2.25.2016
Upper Columbia Spring Chinook	Methow River	MEC10A	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	2015: No actions were undertaken during 2012-2015 for this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10A	Upper Methow	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	10.00%	60	60	60	75	65	75	Heath Ranch. Some opportunity between Goat Creek and Lost River.; includes Goat Creek	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10A	Upper Methow	6.1: Channel Structure and Form: Bed and Channel Form	15.00%	75	75	75	85	77	85	Localized evere incisions, channel straightening. Most actions would occur from Lost River down to Weeman Bridge; includes Goat Creek..	2012: Same benefit for Chinook & steelhead 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10A	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	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10A	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.	2012: minimal impact from beaver reintroduction 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Upper Columbia Spring Chinook	Methow River	MEC10A	Upper Methow	9.1: Water Quantity: Increased Water Quantity	0.00%								2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10A	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	2012: most beaver reintro in Goat Ck (bull trout stream) 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10B	Lost River	1.1: Habitat Quantity: Anthropogenic Barriers	0.00%	75	75	75	98		98		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10B	Lost River	3.1: Food: Altered Primary Productivity	20.00%	75	75	75	85	75	85	Used same values as Early Winters	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10B	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	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10B	Lost River	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	85	85	85	85	85	85	Evaluated for watershed	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10B	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)	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC10B	Lost River	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%	60	60	60	90		90		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	LF Weight	Low Bookend	Original 2018 Estimate	Updated 2018 Estimate	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	LF Weight and Bookends Comments	Estimates Comments
Upper Columbia Spring Chinook	Methow River	MEC10B	Lost River	9.1: Water Quantity: Increased Water Quantity	0.00%								2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	1.1: Habitat Quantity: Anthropogenic Barriers	0.00%	93	93	93	94	93	96		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	3.1: Food: Altered Primary Productivity	20.00%	75	75	75	85	77	85		2012: YN - implement nutrient enhancement assessment. Low initial estimate - uncertain of potential benefits. 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	4.1: Riparian Condition: Riparian Vegetation	15.00%	85	85	85	88	85	92		2012: release upstream from disturbed area 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	15.00%	85	85	85	88	85	92		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	6.1: Channel Structure and Form: Bed and Channel Form	20.00%	90	90	90	93	90	95		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	6.2: Channel Structure and Form: Instream Structural Complexity	20.00%	92	92	92.5	95	93	95		2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16 After Yakama Nation input, added one project that treated 0.1 stream miles and was fully effective upon implementation. Relative to the 18.6 Chinook bearing stream miles in the assessment unit, there will be a 0.5% improvement. EWW 7.29.16

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 Spring Chinook	Methow River	MEC11	Upper Twisp	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	90	90	90	95	90.5	95		2012: Beaver release more likely in tribs (Buttermilk Ck) - tribs are sediment source; small % of issue 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC11	Upper Twisp	9.1: Water Quantity: Increased Water Quantity	0.00%								2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC12	Wolf Creek	2.3: Injury and Mortality: Mechanical Injury	10.00%	75	75	75	90	90	90	ADDED LF DURING 6/28/12 WORKSHOP need to evaluate status of screens in Wolf Ck Chinook utilize downstream habitat - need screen survey for lower reach	2012: fix Wolf Ck ID screen (in wilderness) 2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC12	Wolf Creek	4.1: Riparian Condition: Riparian Vegetation	15.00%	80	80	80	82	80	85	Lower 2 miles; RM 0-2.5	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC12	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	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC12	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	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Methow River	MEC12	Wolf Creek	9.2: Water Quantity: Decreased Water Quantity	30.00%	65	65	65	70	70	70	Wolf Creek Irrigation Diversion; Biddle Ponds(?)	2015: No actions were undertaken during the 2012-2015 time frame to address this limiting factor, therefore there was no change from the low bookend. EWL 3.11.16
Upper Columbia Spring Chinook	Wenatchee River	WEC1	Chiwawa	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	98	98	98	99	98	99		2015 EP LB: No actions, no uplift. (Note: EP deleted an irrigation ditch/diversion project, which they determined was not completed in 2014-2015) -MAH 2.24.16

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 Spring Chinook	Wenatchee River	WEC1	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(?)	2015 EP LB: No actions, no uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC1	Chiwawa	4.1: Riparian Condition: Riparian Vegetation	15.00%	90	90	90	92	90	95		2015 EP LB: No actions, no uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC1	Chiwawa	5.2: Peripheral and Transitional Habitats: Floodplain Condition	15.00%	95	95	95	97	95	97		2015 EP LB: No actions, no uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC1	Chiwawa	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%	93	93	93	94	93	95		2015 EP LB: No actions, no uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC1	Chiwawa	7.2: Sediment Conditions: Increased Sediment Quantity	0.00%	29	29	29	29	29	29		2015 EP LB: No actions, no uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC2	Chumstick	1.1: Habitat Quantity: Anthropogenic Barriers	8.00%	80	80	80	95	85	95	Mainstem Chumstick is close, but barriers on tributaries and Merry Canyon	2012 LF EP: distributions similar for juveniles, steelhead distribution greater for spawning / 2015 LB EP: Action was approximately RM9, which is upstream of extent of chinook use. Chinook use only documented to confluence with Eagle creek, approximately first 2 river miles. No uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC2	Chumstick	4.1: Riparian Condition: Riparian Vegetation	14.00%	60	60	60	65	60	80		2015 LB EP: Action is significantly upstream of known Chinook use. No uplift.-MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC2	Chumstick	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	5.00%	55	55	55	60	55	60		2015 LB EP: No actions, no uplift. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC2	Chumstick	6.2: Channel Structure and Form: Instream Structural Complexity	5.00%	55	55	55	60	55	60		2015 LB EP: No actions, no uplift. -MAH 2.24.16

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 Spring Chinook	Wenatchee River	WEC2	Chumstick	7.2: Sediment Conditions: Increased Sediment Quantity	20.00%	60	60	60	75	60	75		2012 LF EP: Bookends remnant of last cycle- not a LF form 2013 + / 2015 EP LB: No actions, no uplift. -MAH 2.24.16. The one project listed was 6 miles upstream of Chinook habitat. EWL 3.15.16
Upper Columbia Spring Chinook	Wenatchee River	WEC2	Chumstick	8.1: Water Quality: Temperature	20.00%	75	75	75.1	77	75	85	Reflects growth of Populus species, but not reconnection of floodplain, etc.	2015 LB EP: No data for the temperature of the water input from the acquistion, so unclear if there is any significant effect on water temperature. Therefore, not clear whether there is a temperature benefit from the only action. Lease is 5-years only at this time, from 2014-2019. Panel determined some uplift was probable from leaving water in-stream, and decided to give the minimum uplift possible of 0.1% uplift. -MAH2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC2	Chumstick	9.2: Water Quantity: Decreased Water Quantity	28.00%	50	50	52	90	50	90		2012 LF EP: Water quantity project metrics tbd. / 2015 LB EP: Point of diversion was near the mouth of Eagle Creek so may benefit Chinook. Panel considered 18 ac-ft is equivalent to .05-CFS for 180 days, or 0.1-CFS for 90 days. Chumstick flow is approximately 3CFS during lowest flows. This action was only during irrigation season, it is a 5-year agreement with a landowner to not use that water. There is at least 1 gauge in Chumstick, maybe 2. Benefit would be seasonal. Panel determined the benefit is 0.06 CFS average over 5-months (the length of the agreement), and main benefit is over 90 days (low flow summer). The baseflow is 3 CFS. Uplift is 0.06 CFS/3 CFS = 2.0%. -MAH 2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC3	Icicle	1.1: Habitat Quantity: Anthropogenic Barriers	35.00%	70	70	70	90	70	90	Look at relative AU weight for Icicle - evidence no historic passage above boulder field	2012 LF EP: 45% change applied to steelhead only- low bookend changed from 55 to represent existing condition for chinook. / 2015 LB EP: No actions, no uplift. -MAH2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC3	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.	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC3	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)	2015 LB EP: No actions, no uplift. (Note: EP deleted two actions in RM3 that had no AA nexus) -MAH.2.24.16

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 Spring Chinook	Wenatche e River	WEC3	Icicle	6.2: Channel Structure and Form: Instream Structural Complexity	15.00%	21	21	21	21	21	21		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC3	Icicle	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	70	70	70	75	70	76	Conditions here improving naturally over time.	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC3	Icicle	9.2: Water Quantity: Decreased Water Quantity	25.00%	55	55	55	65	55	65		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC4	Little Wenatche e	3.1: Food: Altered Primary Productivity	25.00%	55	55	55	85	55	90		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC4	Little Wenatche e	4.1: Riparian Condition: Riparian Vegetation	20.00%	85	85	85	85	85	90	Action is to allow natural improvements	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC4	Little Wenatche e	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	90	90	90	95	90	95	Berm at the gravel pits	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC4	Little Wenatche e	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%	97	97	97	98	97	99		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC4	Little Wenatche e	7.2: Sediment Conditions: Increased Sediment Quantity	25.00%	75	75	75	85	75	90		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC5	Lower Wenatche e	1.1: Habitat Quantity: Anthropogenic Barriers	0.00%	98	98	98	99	98	99		2015 LB EP: No actions, no uplift. MAH.2.24.2016

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 Spring Chinook	Wenatchee River	WEC5	Lower Wenatchee	4.1: Riparian Condition: Riparian Vegetation	10.00%	45	45	45	45	45	50		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC5	Lower Wenatchee	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	25.00%	65	65	65.5	80	66	80		2012 LF EP: Includes lower Wenatchee instream flow project (under LF 6.2). 2015:A diversion dam was removed from a side channel in 2014; a flow enhancement and spill benefit project (rewatered part of channel), that treated 0.65 stream miles. By 2018, it is anticipated that the project will be realized to about 10% of it's potential. Therefore the Expert Panel assessed the benefit as 0.065 stream miles fully treated. Relative to the 12 miles of Chinook side channels in the Assessment Unit (connected and disconnected from CMZ report), there was a 0.5% improvement for this limiting factor (0.065/12*100). EWL 3.15.16.
Upper Columbia Spring Chinook	Wenatchee River	WEC5	Lower Wenatchee	6.1: Channel Structure and Form: Bed and Channel Form	20.00%	60	60	60	65	60	65		2015 LB EP: No actions, no uplift. MAH.2.24.2016
Upper Columbia Spring Chinook	Wenatchee River	WEC5	Lower Wenatchee	6.2: Channel Structure and Form: Instream Structural Complexity	10.00%	60	60	60	65	60.1	70		2015 LB EP: The Sunnyslope action is not currently instream or near the water, it is in a floodplain area. Currently, there is no uplift for this LF. -MAH.2.24.2016
Upper Columbia Spring Chinook	Wenatchee River	WEC5	Lower Wenatchee	8.1: Water Quality: Temperature	15.00%	65	65	65.1	70	65	70		2015: Temperature in lower river is often lethal in summer. Temperature in the lower river is controlled by the lake, so even if lower section was fully shaded, there would be no effect on overall function. Flow projects provide more volume (so possibly affecting daily range of temps), but return water is warm, so very limited measurable change. The Expert Panel used the improvement percentage from limiting factor 9.2 (water quantity) and adjusted it to reflect very limited change (1%). Therefore 1% of 5.2% is less than 0.1% and the Expert Panel rounded up to 0.1%. EWL 3.15.16
Upper Columbia Spring Chinook	Wenatchee River	WEC5	Lower Wenatchee	9.2: Water Quantity: Decreased Water Quantity	20.00%	50	51	55.2	65	51	65		2012 EP: More benefit for steelhead juveniles (2%) 2015: Conservative estimate of 38.27 cfs savings from this permanent acquisition of water. Relative to 733 cfs (lowest mean daily baseflow during a 55-year period of record), flow improvement is 5.2% (38.27/733*100). EWL 3.15.16

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 Spring Chinook	Wenatchee River	WEC6	Mission	1.1: Habitat Quantity: Anthropogenic Barriers	10.00%	82	82	82	85	82	85		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	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.	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	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€¦.	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	Mission	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	40	40	40	45	40	45	Lower 6 miles + FS Road	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	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?.	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	Mission	7.2: Sediment Conditions: Increased Sediment Quantity	10.00%	40	40	40	45	40	50	Assess and reduce road impactsâ€¦.	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	Mission	8.1: Water Quality: Temperature	10.00%	35	35	35	45	35	45	Mostly a product of flow Esp. the lower 4 miles	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC6	Mission	9.2: Water Quantity: Decreased Water Quantity	20.00%	30	30	30	60	30	60		2015 LB EP: No actions, no uplift. -MAH.2.24.16

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 Spring Chinook	Wenatchee River	WEC7	Nason	1.1: Habitat Quantity: Anthropogenic Barriers	0.00%	93	93	93	98	93	98		2015 LB EP: LF is not weighted. Panel discussed the benefit from the Lower White Pine reconnect project for juveniles, however, determined no uplift calculation since LF1.1 is not considered a limiting factor in this AU. -MAH2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC7	Nason	3.1: Food: Altered Primary Productivity	10.00%	60	60	60	80	60	85		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatchee River	WEC7	Nason	4.1: Riparian Condition: Riparian Vegetation	10.00%	50	50	50.04	55	52	60	Includes recruitment of LWM	2015: One project that treated 0.13 stream miles was adjusted based on 1% plant growth/year toward Properly Functioning Condition up to 2018. Thus, by 2018, there will be realized improvement on 0.0065 stream miles of riparian habitat. Relative to the 15.8 Chinook stream miles in the Assessment Unit (from Streamnet), this project improved riparian condition by 0.04% (.0065/15.8*100). EWL 3.20.16
Upper Columbia Spring Chinook	Wenatchee River	WEC7	Nason	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	25.00%	60	60	73	80	80	80	Increase LWD complexes; reconnect side channel habitat; 1.1, 1.2, and 1.3 scored together	2012 LF EP: Includes completion of 4 Nason planned actions (LWP, N1, 2 UWP projects) + 2 access actions (Coulter/RR) 2015: Four projects that among other things redid high and low flow channels through old parking lot, flew in logs and enhanced 207 oxbow, side channels created in marshy areas, removed old bridge abutment, treated 1.57 miles. The project lengths were adjusted to account for realized improvement by 2018 (0-85%) resulting in 1.07 miles treated. Relative to the 10.7 potential Chinook bearing side channel miles in the Assessment Unit (connected and disconnected from CMZ study report), the projects yielded a 10% improvement (1.07/10.7*100). EWL 3.15.16 During the separate meeting with Yakama Nation (YN) on 27 April, 2016 and again the Lookforward meeting (June, 2016) the full panel discussed Lookback calculations and modified the calculation for this limiting factor. Based on input from YN, the White Pine project was prorated 100% because it now provides year round flow (=0.38 side channel miles treated with realized improvement to 2018). Therefore the new value for side channel miles treated with realized improvement to 2018=1.39 miles, relative to the 10.7 side channel miles in the assessment unit = 13.0%. EWW 7.27.16

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 Spring Chinook	Wenatche e River	WEC7	Nason	6.1: Channel Structure and Form: Bed and Channel Form	20.00%	60	60	61.8	65	63	65		2015: Two projects treated 0.19 river miles, and those river miles were adjusted to account for anticipated improvement success by 2018 (=0.107). Relative to the 15.8 Chinook bearing river miles in the Assessment Unit (from Streamnet), the improvement for this limiting factor = 0.7% (0.107/15.8*100). EWL 3.15.16. Based on input from Yakama Nation during April 2016 meeting and June 2016 Lookforward meeting discussions, one project was added for a realized change of 0.278 stream miles treated. Relative to 15.8 Chinook bearing stream miles = 1.8% improvement. EWW 7.27.16
Upper Columbia Spring Chinook	Wenatche e River	WEC7	Nason	6.2: Channel Structure and Form: Instream Structural Complexity	20.00%	50	50	53.2	55	58	60		2015:. YN 2014 Lower Nason Instream project was not included in consideration because the Expert Panel had no information about it. Two projects that treated 0.86 miles were considered The project lengths were adjusted to account for anticipated improvement by 2018 (=0.51).Improvements were evaluated based on indicators such as # of wood pieces and pools per mile or 100 meter. Relative to the 15.8 Chinook bearing stream miles in the Assessment Unit (from Streamnet), the conditions for this limiting factor improved 3.2% (0.51/15.8*100). EWL 3.15.16
Upper Columbia Spring Chinook	Wenatche e River	WEC7	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	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC7	Nason	8.1: Water Quality: Temperature	0.00%	80	80	80	80	80	80		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC8	Peshastin	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	70	70	70.2	85	70	85		2015: Fishway repairs were conducted that opened 0.06 stream miles, but those were adjusted (50%) to account for the fact that they were partial. Relative to the 14.9 Chinook stream miles in the Assessment Unit (from Streamnet), the barrier removal project resulted in a 0.2% improvement (0.03/14.9*100). EWL 3.2.16
Upper Columbia Spring Chinook	Wenatche e River	WEC8	Peshastin	4.1: Riparian Condition: Riparian Vegetation	10.00%	60	60	60	65	60	70		2015 LB EP: No actions benefited Chinook, no uplift. -MAH.2.24.16

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 Spring Chinook	Wenatche e River	WEC8	Peshastin	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	20.00%	25	26	26.2	30	26	30		2012 LF EP: include 6.2 LF action here 2015 LB EP: Panel considered there was 0.2 miles of side channel treated x 50% seasonal prorate and divided by 8.4 miles of side channel/wetland potential in the reach = 1.2% uplift.-MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC8	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	2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC8	Peshastin	6.2: Channel Structure and Form: Instream Structural Complexity	15.00%	55	55	55.5	75	56	75		2015 LB EP: Panel determined that the Project channel and use is seasonal, so 0.15 miles x 50% / 14.9 miles = 0.5% uplift-MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC8	Peshastin	8.1: Water Quality: Temperature	0.00%	98	98	98	99	98	99		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC8	Peshastin	9.2: Water Quantity: Decreased Water Quantity	35.00%	20	20	20	80	20	80		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC9A	Middle Wenatche e	1.1: Habitat Quantity: Anthropogenic Barriers	50.00%	95	95	95	95	95	95		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC9A	Middle Wenatche e	6.1: Channel Structure and Form: Bed and Channel Form	50.00%	85	85	85	85	85	85		2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC9A	Middle Wenatche e	6.2: Channel Structure and Form: Instream Structural Complexity	0.00%								2015 LB EP: No actions, no uplift. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC9B	Upper Wenatche e	1.1: Habitat Quantity: Anthropogenic Barriers	0.00%	95	95	95	98	95	98		2015 LB EP: LF is not-weighted, and EP determined no uplift. Uplift=0%-MAH.2.24.16

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 Spring Chinook	Wenatche e River	WEC9B	Upper Wenatche e	4.1: Riparian Condition: Riparian Vegetation	33.00%	80	80	80.02	82	81	85		2015: One project treated 0.1 stream miles, which was adjusted by the Expert Panel to reflect realized improvement to 2018 based on a 1%/year estimate of improvement (=0.004 stream miles). Relative to the 23.5 Chinook bearing stream miles in the Assessment Unit, the project resulted in a 0.02% improvement (0.004/23.58100). EWL 3.20.16
Upper Columbia Spring Chinook	Wenatche e River	WEC9B	Upper Wenatche e	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	34.00%	70	70	70	90	85	90		2012 LF: low bookend changed from 90. / 2015 LB EP: Determined no actions in AU impact this LF, no uplift.-MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC9B	Upper Wenatche e	6.2: Channel Structure and Form: Instream Structural Complexity	33.00%	60	60	60.7	80	70	85		2012 LF EP: Refer to LF 5.1 action descriptions. 2033 value constrained by social consideraitons/recreational uses. / 2015 LB EP: Determined that 0.17 mile action x 100% prorate divided by 23.5 total stream miles = 0.7% uplift.-MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC10	White	3.1: Food: Altered Primary Productivity	20.00%	70	70	70	75	70	75		2015 LB EP: No action, no change. -MAH2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC10	White	4.1: Riparian Condition: Riparian Vegetation	25.00%	85	85	85	90	85	95		2015 LB EP: No action, no change. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC10	White	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	25.00%	90	90	90	95	90	95		2015 LB EP: No action, no change. -MAH.2.24.16
Upper Columbia Spring Chinook	Wenatche e River	WEC10	White	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	85	87	94.2	90	87	95		2012 EP: addresses majority of impacted area. 2015:One LWD project treated 1.7 river miles, and was assessed at 100% effective by 2018. Relative to the 18.5 Chinook bearing river miles in the Assessment Unit, the project resulted in a 9.2% improvement (1.7/18.5*100). EWL 3.15.16