Biological Notes for May 18-19 Expert Panel Look Forward in Dayton, WA.
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Notes:
If a cell is blank, presume not discussed due to no applicable actions for that LF.
Rationale in red text is flagged for panel review/input.
"No action" statements refer to Action Agency nexus projects. Other actions with no Action Agency nexus may have occurred, but are not considered in EP process.
A subset of the panel membership prepared a spreadsheet of denominators and estimated uplifts prior to the session. These calculations were displayed on screen during the session for the panel to concur with or revise.
The calculation spreadsheets prepared by Cardno during the panel session reflect the panel's discussion and the preliminary calculations described above.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	2012 LF Weight	2012 Low Bookend	Original 2018 Estimate	Updated 2018 Estimate (2015 Look Back)	Comment	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	2012 LF Weight and Bookends Comments	2015 Look Back Estimates Comments	Comment July 2016	Revised AU Weight (Look Forward Meeting 2016)	Revised LF Weight (Look Forward Meeting 2016)	2016-2018 LF Weighting Comments / Rationale	Revised 2015 Low Bookend (Look Forward Meeting 2016)	2015 Low Bookend Comments/Rationale	2015 Low Bookend (Look Forward revisions override Look Back calculated functions)	Updated 2018 Estimate (2016 Look Forward)	Updated 2018 Estimate % change	2016-2018 Look Forward Estimate Comments / Rationale
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	90	90	91		95	90	95	Progress towards 2018 bookend = 95%; Starbuck Dam, DeRuwe falls, vortex weir below Panjab, hixon creek and isolated/rare perennial/spring creeks with culverts; 2011 level of certainty =2 In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage barriers and screens identified as limiting factors in the BiOp have been almost entirely addressed since the BiOp was completed. As a result, the Tucannon habitat programmatic did not specifically	No barrier removal projects were identified at 2012 workshop. That said, bookend estimates assume Russell and Hartsock springs and Tumalum and Hixom projects were addressed. 2015 Expert Panel consensus was to apply same rationale to Chinook and steelhead for estimate of a 1% uplift. The only action (at Panjab Bridge) addressed a partial barrier and only benefitted juveniles; so it was considered "minor" insofar as total barriers to fish are concerned. Thus, the 1% uplift. The low bookend assigned for both Chinook and steelhead during the 2012 Expert Panel was questioned and will be redefined during the look forward. The group agreed the bookends needed to consider conditions for juveniles and adults. It was unclear what life stages were considered when the low bookend was established. The panel also discussed what can be achieved from here forward as progress toward the high bookend. The panel will revisit these questions during the look forward. Comments entered 12/18/2015 RM.	We are no longer treating chinook the same as steelhead going forward. The projects are the same but the uplift is now relative to the denominator for each. The Panel is focusing on improvements at Tucannon Weir and revisiting some past structures i.e. Tumalum Culvert.					No change, per EP sheet.	91	95.6	4.6	General note: Some panel members (Kris and John) previously reviewed data sources and Look Back information, and consolidated into one spreadsheet workbook, offered to Tech Team and Nez Perce Tribe for review prior to the Look Forward panel session. This spreadsheet includes denominators and was shown to the panel by projecting on a third screen. This is referred to as the EP sheet, which is different from the calc table compiled by Cardno during the panel session. Project lists used in the EP sheet include those likely to occur based on funding and other feasibility factors. The EP sheet also includes new denominators, which were assembled from local knowledge and differ from Streamnet. Panel considered changing Chinook assessment unit weights, but chose to leave them as-is for the time being unless otherwise noted. 2012 project removes from 2018 period. Calc table contains
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	2.3: Injury and Mortality: Mechanical Injury	2.00%	96	96	96		97	96	98	Progress towards 2018 bookend = 99%; 2011 level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB	No projects identified at 2012 EP workshop. No action. No change. Comment entered 12/18/2015 RM.			0	EP chose to reduce limiting factor weight to zero.				96	96	0	No actions applicable to this limiting factor are expected within 2013-2018 period in this assessment unit. No change in function percentage expected.
	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	3.1: Primary Productivity													0	Panel added limiting factor 3.1 due to concerns that this was limiting. But there are limited data on this limiting factor at this time. Focus on lack of carcasses (ocean-derived nutrients), but assigned 0% weight.	20	Primary productivity status unknown, but lack of carcasses (ocean-derived nutrients) is a problem. Estimated at 20%.	20	20	0	Nutrient enhancement (Tucannon Hatchery Diversion): treated 11 miles with carcass placement out of 56 miles. Food web effects are difficult to quantify. Panel prorated improvement at 15%. But permitting may not make action possible within 2018 period, so no actions and 0% uplift expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	4.1: Riparian Condition: Riparian Vegetation	10.00%	48	55	55.25		55	75	75	Progress towards 2018 bookend = 87%; 2011 level of certainty = 1; Data from Table D-3b of Anchor 2011 Tucannon geomorphic assessment - % coverage > 5' height	The Expert Panel deliberated over how to establish a denominator that would be used to estimate benefits. Considered were 30 mi identified for fish bearing potential based on the geomorphic assessment completed for the Tucannon, the extent of steelhead distribution, fish bearing potential based on temperature, the Chinook domain used to distribute CHaMP sites, and the Recovery Plan (68 mi) that includes tributaries to the Tucannon. The panel agreed to use 30 mi (for Chinook only) and will revisit this during the look forward when the low and high bookends are reviewed. Based on 30 mi = 1,091ac of rip at 300 ft width, a 76 ac treatment influences a 6.96% uplift. Consensus on 7% uplift. This discussion influenced the use of 30 mi as the denominator for other Chinook limiting factors. Comments entered 12/18/2015 RM.			20	Extensive discussion within panel regarding limiting factor weights, state of the watershed, and how the limiting factors are used. Of the 14 limiting factors discussed, 5 to 6 are key. Main driving ones: complexity (including riparian large woody debris/recruitment) and channel confinement. Limiting factors selected in part based on what is measurable and feasible to affect within 2018 period.		No change, per EP sheet.	55.25	55.28	0.03	Panel considered area planted, time to maturity (vegetation growth rates), mortality, and functional benefit within 2018 period. See calc table and EP sheet. Panel used acres as metric, with 300-foot buffer (150 feet on each side for the length of stream miles in the assessment unit: 57 miles minus wilderness area(14.1 Acres), and then application of riparian restoration goal of 75%) (note that this calculation method was used in all assessment units, but that restoration percentage goal differed based on recovery plan). Total denominator was 1,157 acres. Treated: 39 acres (sum of 7 projects). "Realized change" column applies predicted prorations of vegetation survival and growth within 2018 period. Yields 0.03% expected uplift.
	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	4.2: Riparian Condition: LWD Recruitment	2.00%	20		20.04							The panel will consider riparian forest stand age and composition in future years as riparian areas develop to determine habitat function.		2	Panel discussed adding limiting factor 4.2 because other limiting factors were not reflecting their concern about long-term large woody debris recruitment, but this is a difficult limiting factor to use and assess, given the time scale of tree growth. Panel noted that these factors are not independent: some are dependent on others, and therefore the benefits can be captured in other limiting factors (e.g., 4.1 and 6.2). Weight = 2%.	20	Added limiting factor.	20	20.04	0.04	Tables have 5 projects that will affect large woody debris recruitment, measured in acres. Treated: 31.5 acres. Denominator is 2,055 acres (larger than for limiting factor 4.1, because there is nothing preventing large woody debris recruitment in the wilderness area). Panel applied 2.5% proration to show slow large woody debris recruitment change through time. Yields 0.04% expected uplift.
	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions	20.00%	25		28							The panel will consider how to estimate the development of off channel and side channel habitats in future panels.		20	Panel added limiting factor 5.1 because other limiting factors were not reflecting their concerns regarding side channels.	25	Much work remains to be done: many side channels disconnected.	25	28	3	Tables contain 3 projects. Calculated based on percent improvement (= % of project reach treated times % instant impacts) added to % estimated improvement by 2018, which equals percentage of potential side channel function that has been addressed. Assumes a partial (not complete) increase in function after the next high flow. Denominator set at 42.42 miles (56.52 stream miles minus 14.1 wilderness miles). In the future, intent is to collect data on miles of potential side channel, but these are not available at this time. Yields 3.01% expected uplift.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	46	56.3	47		46	50	50	Metric = Confinement. Progress towards 2018 bookend = 57%; 2011 level of certainty = 1; 31 of 37 miles between King Grade and the upper extent of spring Chinook distribution are artificially confined (2011); CCD project unconfined 10% of the reach in the fall of 2011; assessment shows 28 projects that would improve to 76% but with human capacity limitations achieving 50% is most likely.	The 2012 estimate was based on approx. 70 ac of floodplain being reconnected. The 2015 estimate was based on a denominator of 30 mi and a total treatment of 11.2 miles from eight projects that would influence a 37% uplift. Projects were considered beneficial if they removed levees, added wood, and improved connectivity. Comments entered 12/18/2015 RM. As per Kris Buelow on 3.25.16, "Between 2012 and 2015, 9.09 miles of habitat were treated for floodplain confinement within 8 project reaches. Projects objectives include levees, rip rap removal, placed wood structure to reduce the bank full frequency, and reconecting side channels. The actions are producing a 30.3% uplift (see calculator). The projects include work done in PA-1, 3, 10, 11, 14, 15, 23 and 24. Projects not included is PA-22 because confinment actions were not completed there and PA-26 was included in the 2012 update. Data used is based on rapid habitat surveys completed following project completion and reflect restoration actions not project effectiness which would be captured over time by CHaMP and AEM.The % improvement refers to the % treated in this case not effectivness." Therefore, based on this information the calculation spreadsheet was updated such that 9.09 stream miles of treatment was made relative to the 30 Chinook stream miles in the Assessment Unit ((Anchor 2011) and the uplift changed from 37.5% to 30.3% (9.09/30*100). EWL 3.30.16	The uplift calculator was modified to better calculate habitat function and less a direct 1:1 of habitat project length to uplift. The panel also standardized the denominator for calculating improvement of function. The coments to the left would reflect change to the look back?			20	Panel adjusted weights to accomodate added limiting factors and current understanding of factors.	47	Panel revised based on EP sheet.	47	51.14	4.1	Same projects as for limiting factor 5.1, and same denominator and calculation framework, but different proration percentages because different portions of reach were treated for this limiting factor, and there are different instantaneous benefits for 2 of the projects, which emphasized addressing limiting factor 5.2. Yields 4.14% expected uplift.

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Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	6.1: Channel Structure and Form: Bed and Channel Form	0.00%	44		56.9		75		85	Progress towards 2018 bookend = 59%; 2011 level of certainty = 2. Goal not in recovery plan but reference stream (Wenaha) is 17. If goal is 17 and we are curently at 39 then we are 51% of goal.	No projects identified for this limiting factor in 2012. In 2015 there was a question whether the bookends established previously were too high and whether treatment affects should be considered immediately or in the out years. The panel agreed to credit the treatments immediately based on an assumption that some benefits are immediate and others are realized over time depending on action type. Based on this the panel weighted their estimate of benefits. The panel recognized a disconnect between the low bookend and estimated benefits for this limiting factor and questioned whether uplift should be based on functionality or extent of treatment. The panel tabled the discussion recognizing that function translates to survival benefits per the BiOp. Based on this the panel assigned a 37% uplift using a denominator of 30 mi and a total treatment of 11.2 miles from eight projects. The panel will revisit the bookends in the look forward. Comments entered 12/18/2015 RM. Kris Buelow (SRSRB) commented on 3.25.16 that the analysis for Limiting Factor 5.2 in this Assessment Unit should be duplicated for this limiting factor. Therefore the uplift was changed from 37% to 30.3% (9.09/30*100). EWL 3.31.16	The uplift calculator was modified to better calculate habitat function and less a direct 1:1 of habitat project length to uplift. The panel also standardized the denominator for calculating improvement of function. The coments to the left would reflect change to the look back?		10	Panel adjusted weights to accommodate added limiting factors and current understanding of factors.	30	Panel revised based on EP sheet.	30	31.81	1.8	Panel discussed time lag for effect to complexity from large wood projects versus immediate changes in bed form from channel reconstruction projects. More short-term (within 2018 period) value seen in limiting factor 6.2 rather than 6.1. Bed form is not always the main goal: it may be secondary to instream complexity and floodplain connectivity. Bed and channel form can remain static until channel-forming high flows change them suddenly and quickly in response to habitat actions. Denominator set at 42.45 miles. Treated 5.9 miles. Panel assigned lower instant benefit for this limiting factor in prorations. Estimated that 50% of complexity is from construction, with 20% being instant, plus 1.5% per year vegetation growth through 2018. Yields 1.81% expected uplift.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	15	30	46.4	29.8	30	32	32	The expert panel separated this limiting factor into two metric types for evaluation. LWD per BF width weighted 20% and habitat units weighted 10%. Habitat units are responsive to CHaMP parameters. For purposes of the process, the expert panel combined the metrics for a total limiting factor weight for 6.2 of 30%. Based on the LWD per BF metric progress toward 2018 bookend was estimated at 47%; 2011 level of certainty = 2; 16 CHAMP sites had an average of 0.27 pieces LWD (>30 cm d and > 6 m long) per bankfull width between Pataha and Panjab. The goal is for 2 pieces per bankfull width so current condition	The 2012 estimate assumed 21 of 30 mi treated. The 2015 estimate was based on a denominator of 30 mi and a total treatment of 11.2 mi from eight projects that would influence a 37% uplift. Projects were considered beneficial if they removed levees, added wood, and improved connectivity. Comments entered 1/11/16 EWL 1.19.16 EP surmised that the benefits realized for LF 6.1 is captured in 6.2. EP will reconsider uplift and inform AAs. On 3.25.16, Kris Buelow (SRSRB) commented: "Between 2012 and 2015 projects with a complexity action were comleted in 10 of the project areas. Based on rapid habitat surveys 10.86 miles of the main channel (based on the orignal 30 miles) were treated with LWD. Based on the rapid habitat surveys not all the projects meet or exceed the >2Key pieces per band full width identified in the restoration plan. So to correct for unequal treatment we apply the %improvement as a correction factor (see Uplift calculator) which produces 9.42 miles of channel complexity and a 31.4% uplift". Therefore, the uplift was modified from 52 to 46.4% based on the calculation: 9.41/30 (Anchor 2011)*100 = 46.4. EWL 3.31.16			20	Panel adjusted weights to accommodate added limiting factors and current understanding of factors.	37	Panel revised based on EP sheet, which incorporated revised denominators.	37	40.8	3.8	Panel discussed time lag for effect to complexity from large wood projects. See rationale for limiting factor 6.1. Panel changed instant benefit to 30%, yielding 2.5% expected uplift.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	7.2: Sediment Conditions: Increased Sediment Quantity	7.00%	85	90	85		90	95	95	The expert panel separated the sediment limiting factor into fine sediment weighted at 2% and embeddedness weighted at 5%. The expert panel combined these into a single weight of 7% to maintain consistency with the standardized limiting factors.	In 2012 no projects were directly associated with this limiting factor. Likewise, in 2015 there were no specific actions to benefit fine sediment. Fine sediment is a concern but benefits are assumed to be secondary and realized as a function of large wood and floodplain reconnection projects. When the RTT develops the spreadsheet for evaluating uplift, improved sediment conditions may be accounted for within these limiting factors. Up to this time the FSA actions have been most effective at addressing sediment. Comments entered			1	Panel considered this limiting factor to be a secondary target.			85	85	0	No actions applicable to this limiting factor are expected within 2013-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	8.1: Water Quality: Temperature	10.00%	34	45	34		45	60	60	Progress towards 2018 bookend = 76%; 16C is the summer standard for PFC; 42 out of 122 days (34% of the days) were less than 16c (122 day summer rearing period June-Sept) at Marengo; 2011 level of certainty = 1	In 2015 the panel determined that any project benefits were secondary and did not result in an uplift to this limiting factor. Comments entered 12/18/2015 RM.			1	Panel considered this limiting factor to be a secondary target for site-scale projects: more driven by watershed-scale functions and not highly influenced by site-scale projects within foreseeable future. But temperature is a problem in the basin.			34	34	0	Temperature is slow to respond to interventions, and site-scale projects can only move it by hundredths of a percentage point unless they are flow projects.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	8.4: Water Quality: Turbidity	1.00%	97	97	97		97	98	98	Progress towards 2018 bookend = 100%; Based on USFS/Col Cons Dist ISCO data collected at 4 sites at and above Territorial in which there were more than 50 NTU 3% of the water year bettween 2007-2011; 2011 level of certainty = 1.	Road decommissioning projects identified to address limiting factor 8.4 are not likely to improve conditions further. In 2015 the panel determined that any project benefits were secondary and did not result in an uplift to this limiting factor. Comments entered 12/18/2015 RM.			0	Panel reduced weight to zero. Did not consider suspended sediment to be limiting to populations. Other habitat factors better capture sediment issues.			97	97	0	No actions applicable to this limiting factor are expected within 2013-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	9.2: Water Quantity: Decreased Water Quantity	5.00%	90	95	90		95	96	96	Progress towards 2018 bookends = 95%;2011 level of certainty = 1. 90% of the WUA at Marengo is available at 77 CFS in August; minimum instananeous flow in Aug, 2011 was 69 CFS, or 90 % of 77 CFS; range has been 65% to 90% between 2005 and 2011.	In 2015 the panel determined that any project benefits were secondary and did not result in an uplift to this limiting factor. Comments entered 12/18/2015 RM.			1	Efficiencies already found in the past, and flow seems to be improving, despite lower than average precipitation. Not a major limiting factor in this area. No future actions planned for 2018.			90	90	0	No actions applicable to this limiting factor are expected within 2013-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	10.4: Population Level Effects: Life History Changes	0.00%	25	25	25		70	25	90	PLACEHOLDER. Straying/by-passing Tucannon River due to unknown but presumed reservoir affects or water quality/quantity in the Tucannon. 25%-50% of the natural origin SPC are by-passing the Tucannon River and ascending the Snake River.	No action. No change. Comment entered 12/18/2015 RM.							25	25	0	No actions applicable to this limiting factor are expected within 2013-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95	95	95		96	95	97	Starbuck Dam; Progress toward 2018 bookend = 99%; level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage	No Chinook barrier projects identified at 2012 workshop. No projects undertaken during 2012-2015 so no uplift was calculated. Comments entered EWL 1/19/2016.			4	Questions/uncertainty regarding Starbuck Dam effects to fish passage. Will investigate in future. Weight reduced to accommodate addition of limiting factor 4.2.			95	95	0	No actions, but panel revised the denominator to 11.3 miles; corroborated by Regional Tech Team.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	2.3: Injury and Mortality: Mechanical Injury	2.00%	96	96	96		97	96	97	Progress towards 2018 bookend = 99%; 2011 level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage	No projects identified at 2012 EP workshop. No projects during 2012-2015 period, therefore no uplift. Comments entered EWL 1/11/16.			0	Panel reduced weight to accommodate addition of limiting factor 4.2.			96	96	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.

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Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	4.1: Riparian Condition: Riparian Vegetation	10.00%	32	32	33.4	32.2	45	32	55	Progress towards 2018 bookend = 71%; 2011 level of certainty =1; Data from Table D-3b of Anchor 2011 Tucannon geomorphic assessment - % coverage > 5' height; riparian in this AU is important to moderate June water temperature and provide LWD recruitment for channel form	The panel evaluated one action in 2015 that treated 5.54 ac (planting over 0.24 mi). For the purpose of this process and for calculating the denominator, the expert panel used a 300 ft (average) buffer width (36 ac) of a total of 508 ac of riparian per mile in the mainstem reach in the AU. The expert panel decided to use 11.3 mi, for mainstem reach length, which does not include tributaries or slackwater at confluence. Based on this the panel estimated a 1.4% uplift. When the expert panel develops a spread sheet for estimating benefits this value could be updated. Comment entered 1/21/2016 RM.			11				33.4	33.5	0.1	1 riparian action expected in 2018 period: PA-40 Tucannon Reach: 5.54 acres to be treated; 5% estimated improvement + 8% improvement, resulting in 0.1% uplift expected per EP sheet. Denominator is 308 stream miles (see notes: 75% of stream miles x 150 feet per side buffer).
	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	4.2: Riparian Condition: LWD Recruitment													2	Panel added limiting factor 4.2.	20	Low bookend estimated by panel based on estimate of current properly functioning condition percentage and work remaining to be done to address this limiting factor.	20	20.1	0.1	1 riparian action expected in 2018 period: PA-40 Tucannon Reach: 5.54 acres to be treated. Same rationale as for limiting factor 4.1, resulting in 0.1% expected uplift.
	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions													19	Panel added limiting factor 5.1 and reweighted.	25	Low bookend estimated by panel based on estimate of current properly functioning condition percentage and work remaining to be done to address this limiting factor.	25	25	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	25	25	30.6	28.8	31	25	32	Metric = Confinement. Progress towards 2018 bookend = 81%; 2011 level of certainty =1; Data from Table D-2b of Anchor 2011 Tucannon geomorphic assessment; reconnecting floodplain is important for water temperature moderation, stream flow maintainance, and physical habitat.	In 2012 the Tucannon Ranch Levee Setback project was not evaluated for benefits to this limiting factor. In 2015 the expert panel evaluated the project and based on consensus to consider benefits relative to 11.3 mainstem miles (that does not include tributaries or slackwater at confluence). Any reference to CHaMP data for the lower Tucannon was limited because there were so few sites. Comments entered 1/11/2016 EWL and edited 1/21/2016 RM. It was recognized that the Tucannon Ranch project did work in side channels and would improve conditions that should be captured under limiting factor 5.1, that is currently not a limiting factor identified for this AU. Based on this the estimated benefits were evaluated relative to limiting factor 6.2. Comments entered 1/19/2016 EWL and edited 1/21/2016 RM. On 3.25.16, Kris Buelow provided the follwing input: "In 2014, the CCD completed a 0.64 mile			19	Panel reduced weight to accommodate addition of limiting factor 4.2.			30.6	30.6	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	6.1: Channel Structure and Form: Bed and Channel Form	0.00%	54		57		54		54	Goal needs defined but as a place holder SMartin suggests 25 for this lower river AU; current CHaMP data is 46.	The action agencies copied the current condition estimate of 54 forward for the low & high bookends & estimates. Although the Tucannon Ranch Levee Project that was implemented in 2014 breached 0.64 miles, the panel only assigned benefits to this limiting factor based on 0.35 miles. So treating 0.35 of 11.3 miles in this AU results in 3% uplift. Comments entered 1/11/2016 EWL and edited 1/20/2016 RM. The look forward will reconsider weighting of this limiting factor. Although uplift was calculated during 2015 look back the limiting factor is weighted at "0". See discussion above in the Limiting Factor Description. Comment entered 1/20/2016 EWL and edited 1//21/2016 RM.			9		30		30	30	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	18	18	21	19.1	45	18	45	The expert panel separated this limiting factor into two metric types for evaluation. LWD per BF width weighted 20% and habitat units weighted 10%. For purposes of the process, the action agencies combined the metric weights for a total of 30% weight for the limiting factor. The expert panel estimated	Tucannon Ranch Levee Setback benefits were evaluated in 2012 and were anticipated to provide benefits that would be evaluated in 2015. for purposes of estimating uplift the panel used the LWD per BF metric. In 2015 although 0.6 miles of levee were breached in chnannel LWD was only placed in 0.35 miles of side channel (that was addressed under 6.1). Treating 0.35 mi out of 11.3 mi in AU resulted in a 3% uplift. Comment entered 1/11/16 EWL and edited 1/20/2016 RM. The Tucannon Ranch Levee Setback involved work on			19	Panel reduced weight to accommodate addition of limiting factor 4.2.			21	21	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	7.2: Sediment Conditions: Increased Sediment Quantity	12.00%	80	85	80		85	90	90	The expert panel separated limiting factor 7.2 into fine sediment that was weighted 3% and embeddedness that was weighted 9%. The expert panel combined these into a single weight of 12% for the limiting factor to maintain consistency with standardized limiting factors. Based on this progress towards the 2018 bookend was 94%; 2011 level of certainty = 1. For fine sediment estimates from 1 year of CHaMP data estimated PFC at 12%. For embeddedness estimates from 1 year of CHaMP data estimated PFC at 20.25.	No projects directly associated with this limiting factor were implemented during 2012 to 2015. Although fine sediment and embeddedness are a concern benefits are assumed to be secondary and realized as a function of large wood and floodplain reconnection projects. When the RTT develops the spreadsheet for evaluating uplift, improved sediment conditions may be accounted for within these limiting factors. Up to this time the FSA actions have been most effective at addressing sediment. Comments entered 12/18/2015 and edited 1/20/2016 RM. If sediment is addressed in the future the panel will comment on this during QA and changes to the weighting of the limiting factor may be made during 2016 look forward. Comments entered 1/19/2016 EWL and edited 1/20/2016 RM.			11				80	80	0	No actions applicable to this LF expected within 2013-2018 period in this AU. No change in function percentage.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	2012 LF Weight	2012 Low Bookend	Original 2018 Estimate	Updated 2018 Estimate (2015 Look Back)	Comment	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	2012 LF Weight and Bookends Comments	2015 Look Back Estimates Comments	Comment July 2016	Revised AU Weight (Look Forward Meeting 2016)	Revised LF Weight (Look Forward Meeting 2016)	2016-2018 LF Weighting Comments / Rationale	Revised 2015 Low Bookend (Look Forward Meeting 2016)	2015 Low Bookend Comments/Rationale	2015 Low Bookend (Look Forward revisions override Look Back calculated functions)	Updated 2018 Estimate (2016 Look Forward)	Updated 2018 Estimate % change	2016-2018 Look Forward Estimate Comments / Rationale
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	8.1: Water Quality: Temperature	5.00%								2011 level of certainty = 1; 16c is adult emigration standard - Steve will get data from WDFW smolt trap for May and June NOTE: No bookends of estimates provided through Expert Panel.	No bookends or estimates provided to for this limiting factor. Tucannon Ranch Levee Setback project not evaluated relative to benefits to this limiting factor. In 2015 there were no projects evaluated specifically for benefits to temperature. Comments entered 1/11/2016 EWL and edited 1/21/2016 RM. Because there are no spring Chinook spawning or rearing in this AU, there are not established temperature goals and no low bookend or 2018 estimates. The panel recognized that actions taken to improve other limiting factors will benefit temperature. Comments entered 1/20/2016 EWL and edited 1/21/2016 RM.				This is an important limiting factor, but mostly affected by watershed-scale processes rather than site-level changes at the time scale discussed in the Expert Panel process. Projects that will significantly affect this limiting factor are unlikely to happen within the 2018 period. Recovery Plan informs priorities of limiting factors, too. Panel noted that some limiting factors can be seen as symptoms of other driving limiting factors rather than stand-alone issues.	20	Panel estimated low bookend on 5/18/2016	20	20	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	8.4: Water Quality: Turbidity	1.00%	80	80	80		85	80	90	Progress towards 2018 bookend = 94%; no data; use upstream data as relative index for this lower AU	Road decommissioning projects identified for implementation in Upper Tucannon but LF 8.4 is already so highly functional that decommissioning not likely to improve further. There were no projects that targeted turbidity specifically undertaken between 2012 and 2015. Comments entered 1/11/2016 EWL and edited 1/21/2016 RM.							80	80	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	9.2: Water Quantity: Decreased Water Quantity	5.00%	95	96	95		96	96	96	Progress towards 2018 bookends = 95%; 2011 level of certainty = 1.90% of the WUA at the mouth is 75 CFS; minimum instananeous flow in Aug, 2011 was 71 CFS, or 95% of 65 CFS	In 2015 the expert panel did not evaluate any actions that benefit this limiting factor; therefore there was not estimate of uplift. Comment entered 1/11/2016 EWL.			0	Panel reduced weight to accommodate addition of limiting factor 4.2.			95	95	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	10.4: Population Level Effects: Life History Changes	0.00%	25	25	25		70	25	90	PLACEHOLDER. 25-50% of the natural origin SPC are by-passing the Tucannon River and ascending the Snake River	LF not discussed in 2015 lookback							25	25	0	No actions applicable to this limiting factor are expected within the 2016-2018 period in this assessment unit. No change in function percentage expected.

ESU	Population	Code	Assessment Unit	2012 Standardized Limiting Factor	2012 LF Weight	2012 Low Bookend	Original 2018 Estimate	Updated 2018 Estimate (2015 Look Back)	High 2018 Bookend	Original 2033 Estimate	High 2033 Bookend	2012 LF Weight and Bookends Comments	2015 Look Back Estimates Comments	Revised AU Weight (Look Forward Meeting 2016)	Revised LF Weight (Look Forward Meeting 2016)	2016-2018 LF Weighting Comments / Rationale	Revised 2015 Low Bookend (Look Forward Meeting 2016)	2015 Low Bookend Comments/Rationale	2015 Low Bookend (Look Forward revisions override Look Back calculated functions)	Updated 2018 Estimate (2016 Look Forward)	Updated 2018 Estimate % change	2016-2018 Look Forward Estimate Comments / Rationale
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	85		85	92		100	Ratio of achievement = 92%; No known barriers but assessment funded by SRFB will evaluate barriers in Alpowa in 2012; 2011 level of certainty = 4.	2015: no actions/no uplift. EWL 1.11.16					Panel discussed need to connect springs.	85	95.2	10.2	One passage project: will reconnected 15 miles of access out of 22 miles. Removal of concrete slab that fails NOAA criteria. Panel prorated benefit at 15% as it is partial juvenile seasonal barrier. This is the only known barrier except for spring connections/protections that may be needed. Wilson Banner rock at intake may need to be fixed. But they have changed how they pull water. Yields 10.2% expected uplift.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	4.1: Riparian Condition: Riparian Vegetation	15.00%	40		40	59		89	Ratio of achievement = 68%; Assessment funded by SRFB will evaluate riparian habitat conditions in Alpowa in 2012; 2011 level of certainty = 4.	One action was listed for implementation during 2012 to 2015. The project did not receive action agency funding. so it wasn't included in the evaluation. Therefore, no actions and resulting uplift were recorded for 2012-2015. Comments entered 1/11/2016 EWL. Comments edited 1/26/2016 RM.		10	Panel adjusted weights to accommodate added limiting factors.			40	40	0	Remove planting project. No nexus. No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
	Asotin Creek	ACS1	Alpowa	4.2: Riparian Condition: LWD Recruitment											2	Panel added limiting factor 4.2.	35	Panel added limiting factor 4.2.	35	35	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
	Asotin Creek	ACS1	Alpowa	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions											10	Panel added limiting factor 5.1. Springs are important because Alpowa is a spring-fed system.	45	Panel added limiting factor 5.1. Springs are important, because Alpowa is a spring-fed system.	45	45	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	35		35	77		85	Ratio of achievement = 45%: Assessment funded by SRFB will evaluate confinement in Alpowa in 2012; 2011 level of certainty = 4.	No actions undertaken during 2012-2015 period, therefore no uplift was recorded for this limiting factor. Comment entered 1/11/16 EWL.		21	Panel adjusted weights to accommodate added limiting factors.			35	35	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	6.1: Channel Structure and Form: Bed and Channel Form	0.00%							The panel proposed to combine limiting factors 6.1 and 6.2 based on an agreement that they do not have enough information currently to distinguish the effects of habitat actions and uplift on each. As more information becomes available they will determine whether to separate 6.1 and 6.2 in the future. If a determination is made to separate and value 6.1 and 6.2 that discussion will take place during the 2016 look forward. Until that time this limiting factor has a "0" weight. Comment entered 1/25/2016 RM.	No actions undertaken during 2012-2015 period, therefore there was no uplift for this Limiting Factor. Comment entered 1/11/2016 EWL.		10	Panel adjusted weights to accommodate added limiting factors.	25	Panel adjusted bookend.	25	25	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	35		40	53		71	Ratio of achievement = 66%; Assessment funded by SRFB will evaluate habitat conditions in Alpowa in 2012; 2011 level of certainty = 4. In 2015 the panel proposed to combine limiting factors 6.1 and 6.2 based on an agreement that they do not have enough information currently to distinguish the effects of habitat actions and uplift on each. As more information becomes available they will determine whether to separate 6.1 and 6.2 in the future. If a determination is made to separate and value 6.1 and 6.2 that discussion will take place during the 2016 look forward. Comment entered 1/25/2016 RM.	In 2015 one action was included in the look back. The project funded staff time that led to much discussion about whether to include the action. The panel also discussed "root matrix strength" and how that influenced support of new structures and overall effect. The system is spring fed, so although the channel may migrate it was not anticipated to happen in the near term. Based on the length treated the panel assigned a 7% uplift. The panel questioned whether the low bookend (35) wastoo high and based on that adjusted the 7% uplift to 5%. Comment entered 1/11/2016 EWL. Comment edited 1/28/2016 RM.		21	Panel adjusted weights to accommodate added limiting factors.			40	40	0	Remove log structure project. No nexus. Thus, no actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	7.2: Sediment Conditions: Increased Sediment Quantity	3.00%	60		60	75		80	Ratio of achievement = 80%; 2011 level of certainty = 4.	In 2015 the expert panel did not evaluate specific actions to benefit this limiting factor. The panel discussed potential benefits from the Alpawa PALS project in 2014 and 2015 based on similar projects in other systems, that were expected to cause gravel sorting and deposition of fines behind wood. The panel questioned whether the action was appropriate for consideration under limiting factor 7.2 because although it did not reduce sediment "inputs" is was expected to improve embededness. Ultimately the panel decided there was no change in percent function or uplift. Comment entered 1/11/2016 EWL.						60	60	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.

Snake River Steelhead	Asotin Creek	ACS1	Alpowa	8.1: Water Quality: Temperature	10.00%	23		23	64		88	Ratio of achievement = 36%; 28 of 122 days (23% of the days) during summer rearing (june thru Sept) were below 16C, which is the PFC standard; instantaneous temperature from DOE gauge provides high degree of certainty; 2011 level of certainty = 1.	No actions reported in 2012-2015 period for this limiting factor, therefore, there was not uplift. Comment entered 1/11/16 EWL.		11	Panel adjusted weights to accommodate added limiting factors.	40	Panel adjusted bookend.	40	40	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	8.4: Water Quality: Turbidity	2.00%	60		60	75		80	Ratio of achievement = 80%; No known data exists; 2011 level of certainty =4.	No actions reported in 2012-2015 period for this limiting factor, therefore, there was not uplift. Comment entered 1/11/16 EWL.						60	60	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS1	Alpowa	9.2: Water Quantity: Decreased Water Quantity	5.00%	90		90	92		95	Ratio of achievement = 98%; stream flow data at the mouth since 2002 is available at https://fortress.wa.gov/ecy/wrx/wrx/flows/station.asp?sta=35K050#block4; howver no WUA calculation exist to compare current flow against; 2011 level of certainty = 2.	In 2015 no actions were reported for this limiting factor, therefore, there was no uplift. Comment entered 1/11/16 EWL.				75	Panel revised bookend, based on known irrigation. Flow drops significantly when irrigation starts.	75	75	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95		95	97		100	Ratio of aachievement = 98%; Only known barrier is curently Headgate Dam; WWCC barrier assessment revealed no other barriers; 2011 levelof cerainty = 1.	No Action. No Change.					After Headgate, not many known barriers in this assessment unit. No change in bookend.	95	99.3	4.3	Headgate passage: BPA paying for cultural resource work and replanting. Open 52.4 miles. Benefit prorated at 5%. Denominator set at 61.1 miles of steelhead use (does not include George Creek). Yields 4.2% expected uplift.
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	4.1: Riparian Condition: Riparian Vegetation	15.00%	65		66	74		93	Ratio of achievement = 88%; Windshield survey suggests riparian is improving in size and maturity and as it matures will move towards high bookends; 2011 level of certainty = 3.	10/29/2015: Charley Creek fence project 10,700 ft fencing along 1 mile of stream (both banks); 27.7 ac riparian planting. Denominator 61.1 miles includes recovery plan fish bearing length (this denominator extends beyond StreamNet miles). Consensus on the use of total length because of availability for treatment. 1/61 miles = 1% improvement. Comment entered by RM 12/10/2015.		10	Panel adjusted weights to accommodate added limiting factors.			66	66.2	0.2	Asotin Creek Riparian: 80 acres over 3 miles, Intensively Monitored Watershed Riparian Project (8.9 acres). Projects in calc table and EP sheet. Panel prorated by survival and growth factors in same manner as for Chinook riparian projects. Also developing other projects, but not sure they will happen within the 2018 time period. Denominator: 1,333 acres. Yields 0.2% expected uplift.
	Asotin Creek	ACS2	Asotin Creek	4.2: Riparian Condition: LWD Recruitment											10	Panel added limiting factor 4.2.	40		40	40	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
	Asotin Creek	ACS2	Asotin Creek	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions											5	Panel added limiting factor 5.1.	25	Geomorphic assessment will inform this when it is completed.	25	25	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	56		56	66		77	Ratio of achievement = 85%; Limited LiDAR/geomorphic assessment from the IMW on upper reaches is all we currently have data for; 2011 level of certainty = 3.	No actions. No change. Comment entered 1/20/2016 RM.		20	Panel adjusted weights to accommodate added limiting factors.		Geomorphic assessment will inform this once it is completed.	56	56	0	Intensively Monitored Watershed project did not received BPA funds. Thus, no change in function percentage.
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	6.1: Channel Structure and Form: Bed and Channel Form	0.00%							This LF/AU was not valued during 2012 and will be updated prior to the look forward. Comment entered by RM 12/10/2015. The panel proposed to combine limiting factors 6.1 and 6.2 based on an agreement that they do not have enough information currently to distinguish the effects of habitat actions and uplift on each. As more information becomes available they will determine whether to separate 6.1 and 6.2 in the future. If a determination is made to separate and value 6.1 and 6.2 that discussion will take place during the 2016 look forward. Until that time this limiting factor has a "0" weight. Comment entered 1/25/2016 RM.	No actions undertaken during 2012-2015 period, therefore there was no uplift for this Limiting Factor. Comment entered 1/28/2016 RM.		10	Panel adjusted weights to accommodate added limiting factors.	25		25	25	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	40		40	55		70	Ratio of achievement = 73%; Limited LiDAR/geomorphic assessment from the IMW on upper reaches is all we currently have data for; 2011 level of certainty = 3. In 2015 the panel proposed to combine limiting factors 6.1 and 6.2 based on an agreement that they do not have enough information currently to distinguish the effects of habitat actions and uplift on each. As more information becomes available they will determine whether to separate 6.1 and 6.2 in the future. If a determination is made to separate and value 6.1 and 6.2 that discussion will take place during the 2016 look forward. Comment entered 1/25/2016 RM.	IMW watershed treated with a significant amount of large wood that was non-Action Agency funded. Suggestion to account for any uplift resultant of these treatments in the 2016 Look Forward. Comment entered by RM 12/10/2015.		20	Panel adjusted weights to accommodate added limiting factors.			40	40	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	7.2: Sediment Conditions: Increased Sediment Quantity	3.00%	60		61	75		80	Ratio of achievement = 80%; 2011 level of certainty = 4.	The same rationale applied to the Charley Creek Project for limiting factor 4.1 was applied here. The expert panel estimated a 1.2 to 1.6% uplift based on 22 acres treated. There was consensus on a 1% improvement. Comment entered by RM 12/10/2015.		3				61	61	0	BPA-funded upland projects reduce sediment loads. Residue management/No-till farming projects funded by BPA. Totals XX acres. [Panel (ACCD) to recalculate based on acres of total crop-designated acres in AU].
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	8.1: Water Quality: Temperature	10.00%	34		34	50		60	Ratio of achievmeent = 68%; 16C is the summer standard for PFC; 42 out of 122 days (34% of the days) were less than 16c (122 day summer rearing period June-Sept) just above George Creek; 2011 level of certainty = 1.	No action. No change. Comment entered by RM 12/10/2015.						34	34	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.

Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	8.4: Water Quality: Turbidity	2.00%	60		61	75		80	Ratio of achievement = 80%; 2011 level of certainty = 4.	The same rationale applied to the Charley Creek Project for limiting factor 4.1 was applied to this limiting factor. Given 22 ac treated for a 1.2 to 1.6% improvement the expert panel agreed on a 1% uplift. Comment entered by RM 12/10/2015.						61	61	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.	
Snake River Steelhead	Asotin Creek	ACS2	Asotin Creek	9.2: Water Quantity: Decreased Water Quantity	5.00%	50		50	80		85	Ratio of achievement = 63%; 90% of WAU at Mouth is available at 55 cfs in August; minimum instantaneous flow in Aug 2011 was 27 CFS (above George Creek) or 50% of 55 CFS; uncertainty about IFIM accuracy and few cfs currently diverted means unlikely to reach bookend; 2011 level of certainty = 1.	No action. No change. Comment entered by RM 12/10/2015.				70	Not much available to be added back instream. Panel increased bookend to 70%. Instream Flow Incremental Methodology (IFIM)	70	70	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.	
Snake River Steelhead	Asotin Creek	ACS3	George Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95		95	97		100	Ratio of achievement = 98%: there are very few if any roads/culverts or other strucutres that would be barriers in George Creek; 2011 level of certainty = 1.	No actions reported in 2012-2015 period, therefore, there was no uplift. 1.11.16 EWL				70	Lowered bookend to account for knowledge of Pintler blockage.	70	84.2	14.2	Pintler project is near the mouth of Pintler Creek. Project will fix an ephemeral barrier, opening passage to 9.4 miles of habitat out of 33.3 miles in the assessment unit. Panel prorated to 50% based on life stages affected (adults and juveniles) and seasonality of flow barrier. Yields 14.2% expected uplift.	
Snake River Steelhead	Asotin Creek	ACS3	George Creek	4.1: Riparian Condition: Riparian Vegetation	10.00%	45		49	54		88	Ratio of achievement = 83%; Lower George meander reconstruction in 2005 moved the baseline but other than the WDFW project in 2012 or 2013, there is nothing planned; 2011 level of certainty = 3.	In 2015 action in Upper and Lower George Creek were evaluated for uplift to limiting factor function. The Lower George Creek fencing and planting project treated 2 of 14.6 (fish bearing) riparian mi. Based on a 300 ft buffer width, 813 ac were estimated to be treated and yielded 2 to 5% uplift in function. A second action In Upper George Creek treated 0.7 mi included fencing and planting 760 ac along1500; weed treatment on10 ac; fencing 0.1 mi along the left bank; and increasing habitat complexity. Based on the two actions and whether benefits should be evaluated based on acres or miles, the panel considered a 5% improvement and then adjusted the estimate to 4% to account for the estimated percent improvement to 23.8 mi (fish bearing reach digitized 2014 stream miles) less 1% of habitat not available due to flow and natural barriers.						49	49.01	0.01	1 project: Pintler: will add 60 pieces and consolidate channel and plant over 3,500 feet. Planned for construction in 2017. More than 11 acres (up to 13 acres) to be treated. Denominator is 605 acres of riparian zone in this assessment unit (100 feet on each side, in this case due to narrow valley bottom). Includes major tributaries as per Recovery Plan. Panel discussed steelhead use of other tributaries near forest boundaries [need to check tributaries: would add 1-2 miles]. Prorated based on low plant survival (20-30%) seen in these areas. Yields 0.01 % expected uplift.	
	Asotin Creek	ACS3	George Creek	4.2: Riparian Condition: LWD Recruitment											2	Panel added limiting factor 4.2 due to concern that wood recruitment is lower than properly functioning condition.	40	Bookend based on estimate of current percentage of properly functioning condition of large wood recruitment potential of riparian zones.	40	40.01	0.01	1 project: Pintler: will add 60 pieces and consolidate channel and plant over 3,500 feet. Planned for construction in 2017. More than 11 acres (up to 13 acres) to be treated. Denominator is 605 acres of riparian zone in this assessment unit (100 feet on each side, in this case due to narrow valley bottom). Includes major tributaries as per Recovery Plan. Panel discussed steelhead use of other tributaries near forest boundaries [need to check tributaries: would add 1-2 miles]. Prorated based on low plant survival (20-30%) seen in these areas. Yields 0.01 % expected uplift.	
	Asotin Creek	ACS3	George Creek	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions											2	Panel added limiting factor 5.1, but there is relatively small amount of side channel. Some potential in lower George due to sediments.	25	Bookend based on estimate of current percentage of properly functioning condition of side channels.	25	25.6	0.6	Pintler project treated 0.7 miles. Panel prorated as per other limiting factor 5.1 ratings. Denominator is 33.33 miles for steelhead. Yields 0.6% expected uplift.	
Snake River Steelhead	Asotin Creek	ACS3	George Creek	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	91		94	92		95	Ratio of achievement = 99%; there are very few roads in George Creek and the only significant confinement feature is incision on WDFW lands that will get restored in 2012 or 2013; 2011 level of certainty = 4.	The expert panel evaluated benefits of the D. Karl's floodplain enhancement action (0.75 mi) and Casey's action relative to 14 mi available for improvement. The actions remeandered the channel, enhanced floodplain connectivity, and improved riparian vegetation. The expert panel discussed the low bookend, recognizing that floodplain condition is not same as floodplain confinement. The process of defining the low bookend in 2012 led to the 91% estimate that the group agreed was probably "right" in terms of confinement but not condition. Based on a geormorphic assessment the CCD is completing, the value will be reconsidered (suggested 30-35%) during the look forward. That point aside, based on the two actions treatment of 5% the expert panel agreed on a 5% uplift. Considering a 23.8		25	Reweighted due to addition of limiting factor 5.1. There is limited floodplain potential in George Creek overall. See weighting calc table, which was reviewed and discussed by panel.	35	Panel revised low bookend based on their understanding of current floodplain connectivity. Geomorphic assessment is underway, which will provide more detail.	35	35.9	0.9	Pintler project treated 0.7 miles. Panel prorated as per other limiting factor 5.2 ratings. Adjusted instantaneous improvement based on current properly functioning condition and project goals. Denominator is 33.33 miles for steelhead. Yields 0.9% expected uplift.	
Snake River Steelhead	Asotin Creek	ACS3	George Creek	6.1: Channel Structure and Form: Bed and Channel Form	0.00%			3				The panel proposed to combine limiting factors 6.1 and 6.2 based on an agreement that they do not have enough information currently to distinguish the effects of habitat actions and uplift on each. As more information becomes available they will determine whether to separate 6.1 and 6.2 in the future. If a determination is made to separate and value 6.1 and 6.2 that discussion will take place during the 2016 look forward. Until that time this limiting factor has a "0" weight. Comment entered 1/25/2016 RM.	In 2015 the panel used 27% from 6.2 as low bookend. The expert panel based the estimate of benefits on the length of the steelhead domain (23.8 mi) that includes 9.2 (protection) and 14.6 (restoration) miles. It was agreed that this was more accurate. The value will also be used to estimate benefits for limiting factors 4.1, and 5.2 and is based on digitized 2014 stream miles that considers habitat availability and impacts of flow and barriers. Based on this rationale, an uplift of 3% (based on improvements to limiting factor 6.2) was estimated. Comment entered 1/11/16 EWL. In the		10	Previously weighted as zero, but panel increased weight to reflect degraded channel condition.	25	There was no low bookend previously. A 3% uplift was added in the last Look Back. Panel assigned percentage of current properly functioning condition.	25	26.1	1.1	Pintler project: adjusted instant improvement percentage based on time for river to respond. Yields 1.1% expected improvement. Denominator is 33.3 miles.	
Snake River Steelhead	Asotin Creek	ACS3	George Creek	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	27		30	43		62	Ratio of achievement = 63%; Lower George meander reconstruction in 2005 moved the baseline but other than the WDFW project in 2012 or 2013, there is nothing planned; 2011 level of certainty = 3. In 2015 the panel proposed to combine limiting factors 6.1 and 6.2 based on an agreement that they do not have enough information currently to distinguish the	In 2015 the expert panel evaluated actions over 23.8 mi (fish bearing length from digitized 2014 stream miles and accounting for dry channels and natural barriers). Based on the treatment area the expert panel estimated uplift of 3%. Comment entered 1/11/2016 EWL		25			Low wood loadings soon in this assessment unit, as compared to properly functioning condition.	30	31.06	1.06	Same rationale as for limiting factor 6.1. No wood at site now. 60-70 pieces to be added. Yields 1.1% expected uplift.	
Snake River Steelhead	Asotin Creek	ACS3	George Creek	7.2: Sediment Conditions: Increased Sediment Quantity	3.00%	55		56	57		80	Ratio of achievement = 96%; 2011 level of certainty = 3.	In 2015 no actions with direct benefits to this limiting factor were evaluated. Some benefits resultant of fencing/shade projects were difficult to quantify therefore the initial expert panel decision was there was no change in benefit. As the panel discussed the limiting factor further, because water temperature						56	56	0	BPA-funded upland projects reduce sediment loads. Residue management/No-till farming projects funded by BPA. Totals 605 acres. [Panel to recalculate based on acres of total crop-designated acres in AU]	34,698 ac of crop land in George Creek Watershed which could be used as denominator
Snake River Steelhead	Asotin Creek	ACS3	George Creek	8.1: Water Quality: Temperature	15.00%	60		60	64		88	Ratio of achievement = 94%; Limited data; meander reconstruction is starting to affect flow and temperature moving from baseline but little increase from 2011 to 2018 anticipated; 2011 level of certainty = 3.	In 2015 the panel discussed temperature and water quantity as issues but because not actions to benefit this limiting factor were implemented during 2012 to 2015 there was no uplift recorded. Comment edited 1/28/2016 RM.		11				60	60	0	Pintler is low in the assessment unit and at best will help maintain water temperatures in that reach, but will not be of much benefit to the rest of the assessment unit.	

Snake River Steelhead	Asotin Creek	ACS3	George Creek	8.4: Water Quality: Turbidity	5.00%	55		56	57		80	Ratio of achievement = 96%; Continued sediment improvements from ag practices; 2011 level of certainty = 3.	In 2015 no actions that specifically addressed this limiting factor were evaluated. Benefits from fencing projects were discussed but it was agreed that they would be difficult to quantify without data. Therefore the panels initial decision was "no change." After		5				56	56	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Asotin Creek	ACS3	George Creek	9.2: Water Quantity: Decreased Water Quantity	2.00%	95		95	96		97	Ratio of achievement = 99%; Brad knows but I don't think there are more than 1 or 2 CFS currently diverted - flow is "naturally" and little chance of increasing without restoring floodplains/vegetation; 2011 level of certainty = 4.	In 2015 no actions to benefit this limiting factor were reported; therefore, there was no uplift. Comment entered 1/11/2016 EWL.					Panel discussed known irrigation rights in George Basin. Few diversions. No change in bookend.	95	95	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	75	95	76	95	96	96	Progress towards 2018 bookend = 79%; 2011 level of certainty = 2. Starbuck Dam, DeRuwe falls, vortex weir below Panjab, hixon creek, several in Pataha and isolated/rare perennial/spring creeks with culverts. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage barriers and screens identified as limiting factors in the BiOp have been almost entirely addressed since the BiOp was completed. As a result, the Tucannon habitat programmatic did not specifically include actions to	No barrier removal projects were identified at 2012 workshop. That said, bookend estimates assume Russell and Hartsock springs and Tumalum and Hixom projects were addressed. 2015 Expert Panel consensus was to apply same rationale to Chinook and steelhead for estimate of a 1% uplift. The only action (at Panjab Bridge) addressed a partial barrier and only benefitted juveniles; so it was considered "minor" insofar as total barriers to fish are concerned. Thus, the 1% uplift. The low bookend assigned for both Chinook and steelhead during the 2012 Expert Panel was questioned and will					Panel confirmed 76% current status, including 1% uplift from last Look Back.	76	79.6	3.6	For steelhead, same projects, same assessment unit area, but different denominator compared with Chinook due to differences in distribution. Same assessment unit weights. Denominator is 89.68 miles (used in EP sheet and calc table: includes Cummins Creek in addition to Chinook creeks). Miles treated: 32.11. Tucannon Hatchery project intake passage improvement. Tumalum Road crossing will not happen within 2018 period. Panel determined 3.6% expected uplift.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	2.3: Injury and Mortality: Mechanical Injury	2.00%	96	96	96	97	97	98	progress towards 2018 bookend = 99%; 2011 level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage	No projects identified at 2012 EP workshop. 2015: no projects/no change. 1.11.16 EWL		0				96	96	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	3.1: Primary Productivity											0	Panel added limiting factor 3.1 due to concerns that this was limiting. But there are limited data on this limiting factor at this time. Focus on lack of	20	Primary productivity status unknown, but lack of carcasses (ocean-derived nutrients) is a problem. Estimated at	20	20	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to	4.1: Riparian Condition: Riparian	10.00%	39	68	42	68	92	92	Progress towards 2018 bookend = 57%; 2011 level of certainty = 3. Data from Table D-3b of Anchor 2011 Tucannon geomorphic assessment - % coverage > 5'	In 2015 the expert panel evaluated 4 planting & fencing projects. The panel discussed buffer width and landform versus length of area treated as the basis for		20	Extensive discussion within panel regarding limiting factor weights, state of the			42	42.02	0.02	Same projects and weightings as for Chinook the details that follow herein yields a 0.02% expected uplift. The panel considered area planted, time to maturity
	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	4.2: Riparian Condition: LWD Recruitment											2	Added limiting factor 4.2 and reweighted others. Panel discussed adding limiting factor 4.2 because other limiting factors were not	20		20	20.04	0.04	Same projects and weightings as for Chinook the details that follow herein yields a 0.04% uplift. Janet Howard treated area for this limiting factor is 0.5 acre. Denominator is 2,061 acres for steelhead.
	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland											20	Panel added limiting factor 5.1 because other limiting factors were not reflecting their concerns regarding side channels.	25	Much work remains to be done: many side channels disconnected.	25	26.7	1.7	Same projects and weightings as for Chinook yielding a 1.7% uplift, based on a denominator of 75.58 miles (that does not include wilderness area) and the same prorations .
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	26	75	50.6	75	83	83	Metric = Confinement. Progress towards 2018 bookend = 35%; 2011 level of certainty = 1. 31 of 37 miles between King Grade and the upper extent of spring Chinook distribution are artificially confined (2011); CCD project unconfined 10% of the reach in the fall of 2011; no data for Pataha or tributaries so this is based on mainstem data	In 2015 it was noted that the previous expert panel did not identify this limiting factor for side channels and probably should have. The benefits are combined in the estimate of uplift. Eight floodplain actions treated 11.2 mi (consensus to use mi as metric). Considering the Upper Tucannon mainstem and artificial confinement, the expert panel used 31 mi as the denominator. Based		20	Panel adjusted weights to accomodate added limiting factors and current understanding of factors.	47	Recalculated with new denominator.	47	49.3	2.3	Same projects and weightings as for Chinook yielding a 2.3% uplift, based on a denominator of 75.58 miles (that does not include wilderness area) and the same prorations .
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	6.1: Channel Structure and Form: Bed and Channel Form	0.00%	51		75.6	75		85	Based on the rationale above the expert panel weighted limiting factors 6.1 and 6.2 as "0" and "30" respectively. For the purposes of this process, the AAs assigned entire 30% weight to limiting factor 6.2 and used the expert panel estimates for 6.2. Habitat units and LWD per BF were the agreed upon metrics for 6.2. The panel agreed this would yield a more conservative estimate. Progress toward 2018 bookend = 68%; 2011 level of certainty = 2. Goal not in recovery plan but reference stream (Wenaha) is 17. If goal is 17 and we are currently at 39 then we are 51% of goal. Per the expert panel, based on LWD per BF current condition was estimated at 15; 2018 bookend was estimated at 62, 2033 bookend at 75. Based on habitat units current condition was estimated at 70, 2018 bookend at 80 and 2033 bookend at 85. For 6.1 the width to depth (WD) ratio was used to estimate current condition at 51; 2018 bookend at 75; and the 2033 bookend at 85.	For this limiting factor the panel agreed to evaluate actions that change bedform, aggredation. and wood loading. Based on this nine actions that treated 10.62.mi were evaluated. Dividing the mi treated by 38.61 the panel agreed on a 27.5% uplift. The panel agreed to add one additional project that changed the width/depth (WD)ratio of the area treated. Based on the additional action the panel revised their estimate to 30% uplift. The panel also questioned whether the low bookend that was based on 2011 CHaMP bedform data was too high. With a goal for a WD ratio of 17 averaged over the entire reach the low bookend would be 39%. Now with a 28.75 WD ratio based on 2011-2014 CHaMP data the low bookend was questioned. If WD ratio is the metric for this limiting factor the panel estimated a 75%goal. Goal setting based on Wenaha data (WD ratio of 10:1) would have set the bar to low (17%). Comment edited 1/28/2016 RM. The expert panel will QA this estimate of benefits.Kris Buelow (SRSRB) commented on 3.25.16 that the analysis for Limiting Factor 5.2 in this Assessment Unit should be duplicated for this limiting factor. Therefore the uplift was changed from 30% to 24.6% (9.09/37*100). EWL 3.31.16		10	Panel adjusted weights to accommodate added limiting factors and current understanding of factors.	30		30	31	1	Same projects and weightings as for Chinook yielding a 1.0% uplift, based on a denominator of 75.58 miles (does not include wilderness area) and the same prorations. The panel discussed the immediate changes in bed form from channel reconstruction projects. More short-term (within 2018 period) value seen in limiting factor 6.2 rather than 6.1. Bed form is not always the main goal and may be secondary to instream complexity and floodplain connectivity. Bed and channel form can remain static until channel-forming high flows change them suddenly and quickly in response to habitat actions.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	70	80	95.5	80	85	85	In 2012 the expert panel weighted limiting factors 6.1 and 6.2 at 30%. For purposes of this process, the panel assigned the entire weight to 6.2 and used estimates for 6.2, habitat units metric. This provided a conservative estimate. Based on the LWD per BF metric progress towards the 2018 bookend was 24%; 2011 level of certainty = 2. Based on 20 CHaMP sites in	In 2015 the expert panel based uplift on key pieces and units of treatment/100 m. Between 2012 and 2015 3,409 key pieces (and 405 natural pieces).Given the movement of wood, it could be more appropriate to consider pieces added to watershed and restored sites to account for the signal from actions over the watershed. Order of magnitude more wood in treated		20	Panel adjusted weights to accommodate added limiting factors and current understanding of factors..	44	Panel recalculated low bookend with new denominators and 2015 Look Back uplift. 89 miles minus wilderness area, minus 13 miles (half of upper	44	46.1	2.1	Same projects and weightings as for Chinook. yielding a 1.4% uplift, based on a denominator of 75.58 miles (does not include wilderness area) and the same prorations. The panel discussed time lag for effect to complexity from large wood projects.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	7.2: Sediment Conditions: Increased Sediment Quantity	8.00%	80	85	80	85	90	90	The expert panel evaluated limiting factor 7.2 relative to limiting factor 8.4 and combined weighted them at 8%. The panel also separated limiting factor 7.2 into fine sediment and embeddedness For purposes of the process, the panel assigned an 8% weight to 7.2 and a 0% weight to 8.4. The panel used the more conservative estimate associated with 7.2. Fine Sediment: progress towards 2018 goal = 94%, current condition = 80, 2018 bookend = 85, 2033 bookend = 90. Based on CHaMP in 2011; averge was 4.4% but only 1 year data; PFC is 12% ; current (2011) condition is a conservative value. Embeddedness: progress towards 2018 goal = 95%, current condition = 90, 2018 bookedn = 95, 2033	In 2015 the expert panel discussed how floodplain projects affect sediment quality and whether the limiting factor definition was getting at sediment input or spawning habitat improvement. For other assessment units the panel did not consider "sorting" relative to this limiting factor. Tons of sediment inputs reduce the length/area of substrate improved. Because there haven't been the high flows that would change bottom sediments up to 2015 (last channel forming flow was 2009) "sorting" in the system has not occurred. Fines are not a significant issue in the Tucannon and in some cases, erosion is encouraged to help form gravel bars and augment gravels. The focus of 7.2 is fine sediment inputs that are influenced by		1	Panel considered this limiting factor to be a secondary target.			80	80	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.

Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	8.1: Water Quality: Temperature	10.00%	34	50	34	50	60	60	Progress towards 2018 bookend = 68%; 16C is the summer standard for PFC; 42 out of 122 days (34% of the days) were less than 16c (122 day summer rearing period June-Sept) at Marengo; 2011 level of certainty = 1.	In 2015 the expert panel noted that riparian treatments. large wood, and floodplain reconnection can benefit this limiting factor. Because habitat actions have become more complex with a variety of elements and benefits, quantifying benefits to limiting factor function has become more difficult, especially for temperature, where benefits are small/ project and not always robustly measured. Record high air temperatures in the Tucannon in 2015 and low water should have seen high water temperatures, which was not the case, so progress has been made. Previously there were 30 days of water temperature exceedances. In 2015 that number was down to 5, despite extreme summer conditions highs. Beyond shade, riparian		1	Panel considered this limiting factor to be a secondary target for site-scale projects: more driven by watershed-scale functions and not highly influenced by site-scale projects within foreseeable future. But temperature is a problem in the basin.	50	Different than for Chinook. More steelhead seen as you go downstream. Less temperature sensitive than Chinook, so we see steelhead and no Chinook in some areas.	50	50	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	9.2: Water Quantity: Decreased Water Quantity	5.00%	90	95	90	95	96	96	Progress towards 2018 bookend = 95%; 2011 level of certainty = 1. 90% of the WUA at Marengo is available at 77 CFS in August; minimum instananeous flow in Aug, 2011 was 69 CFS, or 90 % of 77 CFS; range has been 65% to 90% between 2005 and 2011.	In 2015 the expert panel noted that riparian treatments. large wood, and floodplain reconnection can benefit this limiting factor. Because habitat actions have become more complex with a variety of elements and benefits, quantifying benefits to limiting factor function has become more difficult, especially for		1	Efficiencies already found in the past, and flow seems to be improving, despite lower than average precipitation. Not a major limiting factor in this area.			90	90	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1A	Upper Tucannon - Pataha up to Panjab	10.4: Population Level Effects: Life History Changes	0.00%	25		25	70		90	PLACEHOLDER: 25-50% of the natural origin SPC are by-passing the Tucannon River and ascending the Snake River; 2011 level of certainty = 5.	No projects listed for this limiting factor, but recognition by EP that riparian projects can improve conditions.						25	25	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95	96	95	96	98	98	Progress towards 2018 bookend = 99%; 2011 level of certainty - 2. Starbuck Dam. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage barriers and screens identified as limiting factors in the	2015: no projects during the 2012-2015 period, no discussion, no uplift. 1.11.16 EWL. 2012:Estimate assumes Russell Spring, Hartsock spring, Tumalum & Hixon projects which are not listed in look forward table.		4				95	95	0	Denominator: 13.88 miles, including mainstem (11.3 miles) and 2.58 miles in Kellogg and Smith Creeks up to barriers that won't be fixed in 2018 period, in addition to Chinook miles. No passage actions expected. [5-24-16: Supplemental spreadsheet provided by the panel indicates mileage included in Kellogg and Smith Creeks is
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	2.3: Injury and Mortality: Mechanical Injury	2.00%	96	96	96	97	96	98	Progress towards 2018 bookend = 99%; 2011 level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage barriers and screens identified as limiting factors in the RiOp have been almost entirely addressed since the	2015: no projects during the 2012-2015 period, no discussion, no uplift. 1.11.16 EWL. No projects identified at 2012 EP workshop		0				96	96	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	4.1: Riparian Condition: Riparian Vegetation	10.00%	32	68	33.4	68	92	92	Progress towards 2018 bookend = 47%; 2011 level of certainty = 2. Data from Table D-3b of Anchor 2011 Tucannon geomorphic assessment - % coverage > 5' height.	The expert panel evaluated the uplift from one action (#35) that treated 5.54 ac (planted over 0.24 mi). Assuming a 300 ft buffer = 36 ac of riparian area per mile, 508 ac along the mainstem were treated. Given a reach length in AU of 14.09 mi (per K. Buleuw) (StreamNet mi 15.7 include some tribs) and the		11				33.4	33.5	0.1	Denominator is 379 acres (more than Chinook). Same rationale as for Chinook, but based on steelhead miles. Yields 0.1% expected uplift.
	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	4.2: Riparian Condition: LWD Recruitment											2	Added limiting factor 4.2.	20		20	20.1	0.1	Denominator is 379 acres (more than Chinook). Same rationale as for Chinook, but based on steelhead miles. Yields 0.1% expected uplift.
	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	5.1: Peripheral and Transitional Habitats: Side Channel and Wetland Conditions											19	Added limiting factor 5.1.	25		25	25	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	27	75	32.6	75	83	83	Metric = Confinement. Progress towards 2018 bookend = 36%; 2011 level of certainty = 1. Data from Table D-2b of Anchor 2011 Tucannon geomorphic assessment.	The same rationale used for TUC1B limiting factor 5.2.. Based on 11.3 mi of habitat in the assessment unit and a total length treated (0.64 mi) by a floodplain complexity action there was a 5.6% uplift. The panel will confirm this value during QA. The Anchor study identified total stream length and confinement that leads to a smaller number of mi "available." Based on		19				32.6	32.6	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	6.1: Channel Structure and Form: Bed and Channel Form	10.00%	54	75	57	75	85	85	Based on the rationale above the expert panel weighted limiting factors 6.1 and 6.2 at "10" and "20" percent respectively. The panel agreed to use WD ratio as the metric. Based on this progress towards 2018 goals was estimated at	Treated 0.36 mi with wood. Instream wood placement downstream of side channel. Breached 0.6 mi levee, but will only account for 0.35 mi under LF 6.1. Will include side channel treatment in estimate. Apply same action(s) as for other LFs. Treated 0.35 mi out of		9		30		30	30	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	6.2: Channel Structure and Form: Instream Structural Complexity	20.00%	36	62	39	62	75	75	In 2012 the expert panel weighted limiting factors 6.1 and 6.2 at 30%. For purposes of this process, the panel assigned as weight of 10 and 20% to limiting factors 6.1 and 6.2 respectively. The expert panel used the LWD per BF metric that it was agreed would provide a more conservative estimate. Based on the LWD per BF metric progress towards 2018	In 2015 the panel evaluated treatment of 0.36 mi with wood, instream wood placement downstream of side channel, and breaching 0.6 mi of levee. The panel will only account for 0.35 mi treated under limiting factor 6.1 and will include side channel treatment in estimate. Treating 0.35 mi of 11.3 mi in the assessment unit results in a 3% uplift. Comments entered by RM		19				39	39	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	7.2: Sediment Conditions: Increased Sediment Quantity	8.00%	80	85	80	85	90	90	The expert panel weighted limiting factors 7.2 and 8.4 together at 8%. The panel also separated 7.2 into fine sediment and embeddedness. For purposes of the process, the expert panel assigned an 8% weight to 7.2 and a 0% weight to 8.4. The panel used the estimates associated with 7.2 as a more conservative estimate for	No actions. No change. Comment entered by RM 12/11/2015.		11				80	80	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	8.1: Water Quality: Temperature	10.00%	34	50	34	50	60	60	Progress towards 2018 bookend = 68%; 2011 level of certainty = 3. No temperature data since 2003 in this AU; goal should be based on adult emigration in this AU.	No action. No change. Comment entered by RM 12/11/2015.		5				34	34	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	8.4: Water Quality: Turbidity	0.00%	80		80	85		90	The expert panel weighted limiting factors 7.2 and 8.4 together at 8%. For purposes of the process, the panel assigned an 8% weight to 7.2 and a 0% weight to 8.4. Progress towards 2018 bookend = 94%; no data; use	No action. No change. Comment entered by RM 12/11/2015.		1				80	80	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	9.2: Water Quantity: Decreased Water Quantity	5.00%	90	95	90	95	96	96	Progress towards 2018 bookend = 95%; 2011 level of certainty = 1. 90% of the WUA at the mouth is 75 CFS; minimum instananeous flow in Aug, 2011 was 71 CFS, or 95% of 65 CFS.	In 2015 the panel did not evaluate actions to benefit this limiting factor; therefore there was no estimate of uplift. Comment entered 1/28/2016 RM. The panel will re-examine potential downstream benefits of efficiency projects in the Tucannon of they determine an estimate of benefit is appropriate.		0				95	95	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1B	Lower Tucannon - Mouth to Pataha	10.4: Population Level Effects: Life History Changes	0.00%	25		25	70		90	PLACEHOLDER; Straying/by-passing Tucannon River due to unknown but presumed reservoir affects or water quality/quantity in the Tucannon. 25-50% of the natural origin SPC are by-passing the Tucannon River and ascending the Snake River.	2015: no projects during the 2012-2015 period, no discussion, no uplift. 1.11.16 EWL.						25	25	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.

Snake River Steelhead	Tucannon River	TUS1C	Pataha	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	75		90	75			No data; 2011 level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage barriers and screens identified as limiting factors in the BiOp have been almost entirely addressed since the BiOp was completed. As a result, the Tucannon habitat programmatic did not specifically include actions to address those two limiting factors but included a provision for occasions when improperly screened diversions or passage barriers were is identified. In those circumstances the habitat programmatic could be considered for funding. Comments entered 1/25/2016 RM.	The 2012 expert panel estimate assumed Russell Spring, Hartsock spring, Tumalum, and Hixon actions that were not listed in the look forward. In 2015 the several barrier removals were implemented in the Pataha. The work was completed with indirect funding to develop two projects upstream of Callaway Hill and Dodge. A barrier near Pomeroy is still in place. Two low water culverts were also fixed. There is a difference between adult and juvenile passage, with adults passing fine. Habitat accessed 3.9 mi above the Forest Boundary and 46 of 52 mi opened by 7 and 5 partial barrier repairs in 2012 and 2014. Based on 49 mi habitat accessed, uplift was rounded to 15% to account for benefits to juveniles only (0.6 ft jump height) that has been addressed. Comments entered 1/11/2016 EWL. Comments edited 1/25/2016 RM.						90	90	0	Pomeroy fish passage project: Not likely to happen in 2018 period. No actions.
Snake River Steelhead	Tucannon River	TUS1C	Pataha	2.3: Injury and Mortality: Mechanical Injury	2.00%				97		98	2011 level of certainty = 2. In 2015, the LCSRB clarified the status of limiting factor 2.3 on the basis that in 2009 in a report to the action agencies, the LCSRB acknowledged that "fish passage barriers and screens identified as limiting factors in the BiOp have been	No projects identified at 2012 EP workshop. In 2015, no projects were reviewed so no uplift was calculated. Comments entered 1/11/2016 EWL. Because there is irrigation in Pataha it was speculated that there may be a need to address this limiting factor. Based on the						0	0	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1C	Pataha	4.1: Riparian Condition: Riparian Vegetation	10.00%	40		40	68		92	Progress towards 2018 bookend = 59%; 2011 level of certainty = 3. 2011 based on windshield survey,CREP footprint, and local knowledge; CHaMP data will be available in 2012; LiDAR may also inform; estimate is based on size/area, not condition.	No projects were reviewed for the 2012 to 2015 implementation period, therefore no uplift was assigned this limiting factor. Comments entered 1/11/2016 EWL.						40	40	0	Removed Pataha large woody debris/structure (no BPA nexus).
Snake River Steelhead	Tucannon River	TUS1C	Pataha	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%							In 2012 the expert panel determined that confinement would be the metric for determining benefits to this limiting factor. However there was no data reviewed to establish this. Thus, during the 2016 look forward the panel discussed considering any new data and establishing book ends for the limiting factor. Comments entered 1/20/2016 RM.	No projects were reviewed during the 2015 workshop because no actions were implemented between 2012 and 2015. Therefore, no estimate of uplift was discussed. Comments entered 1/112016 EWL. New information regarding fish use of the assessment unit will be reviewed during the 2016 look forward and may provide the basis for establishing book ends for						0	0	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1C	Pataha	6.1: Channel Structure and Form: Bed and Channel Form	10.00%				75		85	Based on the logic in the Limiting Factor Description above, the expert panel weighted limiting factor 6.1 as "10" and 6.2 as "20" for a total of "30" weight that represents the combined uplift. This is consistent with what the panel did during the 2012 workshop. Comment edited RM 1/25/2016.	No projects were implemented during 2012-2015. Therefore no uplift was assigned 6.1. Comment entered 1/11/2016 EWL, Comment edited 1/2/52016 RM. In 2012, this AU did not include a restoration reach and was not a focus for treatment. Based on fish data that has come on line, the reach will be considered for						0	0	0	Removed Pataha large woody debris/structure (no BPA nexus).
Snake River Steelhead	Tucannon River	TUS1C	Pataha	6.2: Channel Structure and Form: Instream Structural Complexity	20.00%							Based on the logic in the Limiting Factor Description above, the expert panel weighted limiting factor 6.1 as "10" and 6.2 as "20" for a total of "30" weight to represent the combined uplift. This is consistent with what the panel did during the 2012 workshop. Comment entered RM 1/25/2016. The expert panel used a metric for LWD that's provides a more conservative estimate of benefits to 6.2. Based on the LWD metric (2011 level of certainty =2) the panel estimated a 2018 bookend of 62 and a 2033 bookend of 75. The expert panel also included Habitat Units (2011 level of certainty =2) in their estimate of book ends that resulted a 2018 bookend of 80 and a 2033 bookend of 85. These estimates were based on limited data and will be reexamined during the 2016 look forward. The panel believes the current estimates may be too high. The panel will also consider the "perceived value" of the Pataha that has changed over time. Comments entered 1/11/2016 EWL. Comments edited 1/25/2016 RM.	No projects were implemented during the 2012-2015, therefore not uplift was recorded. Comments entered 1/11/2016 EWL. Comments edited 1/25/2016 RM.						0	0	0	Removed Pataha large woody debris/structure (no BPA nexus).
Snake River Steelhead	Tucannon River	TUS1C	Pataha	7.2: Sediment Conditions: Increased Sediment Quantity	5.00%							The expert panel weighted LF 7.2 Increased Sediment Quantity & 8.4 Waler Quality: Turbidity together = 8%. The panel also split LF 7.2 into 2 subtypes of Fine Sediment & Embeddedness For purposes of the expert panel, the panel assigned 8% weight to LF 7.2 & 0% weight to LF 8.4. Although the values were not based on data the panel estimated Fine Sediment: 2011 level of certainty =1. Embeddedness: 2011 level of certainty = 1.	No actions to benefit this limiting factor were implemented between 2012 and 2015. Therefore, at the 2015 workshop there was no uplift estimated. Fine sediment is a concern but in the short term any benefits will be assumed to accrue as a function of another limiting factor. When the RTT develops the spreadsheet for evaluating uplift improved sediment conditions will be accounted for with another limiting factor. Comment entered 1/11/2016 and 1/20/2016 EWL. Comment edited 1/25/2016 RM. Bank erosion is an an issue in this assessment unit. However, any benefits are determined to be secondary and associated with other projects that may be realized in the future, but may be very small. Comments entered 1/20/2016 EWL. Comments edited 1/25/2016 RM.						0	0	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1C	Pataha	8.1: Water Quality: Temperature	10.00%	30		30	35		45	Progress towards 2018 bookend = 86%; 2011 level of certainty = 1. 86 out of 122 days (Jun-Sep) exceeded 16C so 30% of the time PFC of 16C was met.	No actions to specifically benefit temperature were implemented during 2012-2015. Therefore, there was no estimate of up lift for this period. Comment entered 1/11/2016 EWL.						30	30	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1C	Pataha	8.4: Water Quality: Turbidity	3.00%							The expert panel weighted limiting factors 7.2 and 8.4 together at 8%. For purposes of the process, the panel assigned an 8% weight to 7.2 and a 0% weight to 8.4. It was noted that there were no data informing these estimates.	No projects to benefit turbidity specifically were implemented during 2012 to 2015. Therefore, no uplift was recorded for this limiting factor. Comments entered 1/112016 EWL.						0	0	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.

Snake River Steelhead	Tucannon River	TUS1C	Pataha	9.2: Water Quantity: Decreased Water Quantity	5.00%				95		96	The expert panel discussed flow increases through leases and at this point was not prepared to approximate any estimated benefits from increased instream flows because of issues of over appropriation. The stream gauge in the Pataha is the best estimate of flow conditions and is used at the basis for evaluating condition and uplift. This will be considered during the	No actions to improve flow were implemented during 2012-2015. Therefore, there is no estimate of uplift. Comment entered 1/11/2016 EWL.						0	0	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.
Snake River Steelhead	Tucannon River	TUS1C	Pataha	10.4: Population Level Effects: Life History Changes	0.00%							PLACEHOLDER: 25-50% of the natural origin SPC are by-passing the Tucannon River and ascending the Snake River; 2011 level of certainty = 5.	2015: no projects during 2012-2015 period, no discussion, no uplift. 1.11.16 EWL						0	0	0	No actions applicable to this limiting factor are expected within 2016-2018 period in this assessment unit. No change in function percentage expected.