NOTES:

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

							Original	Undated		Original		
				2012 Standardized		Low	2018	2018	High 2018	2033	High 2033	
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	1.1: Habitat Quantity: Anthropogenic Barriers	5.00%	95	95	95	97		100	Progress towards 2018 bookend = 98%; Only known barrier is curently Headgate Dam; WWCC barrier assessment revealed no other barriers; 2011 level of certainty = 1.
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	4.1: Riparian Condition: Riparian Vegetation	15.00%	65	65	65	74		93	The expert panel discussed the relative maturity of riparian trees and complexity are included in this limiting factor for our purpose and the lag in time from when trees are planted until they reac full riparian function. Comment entered by expe panel 7/20/2016.
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	5.2: Peripheral and Transitional Habitats: Floodplain Condition	30.00%	56	56	56	66		77	Progress towards 2018 bookend = 85%; Limited LiDAR/geomorphic assessment from the IMW on upper reaches is all we currently have data for; 2011 level of certainty = 4.

No action. No change. Comment entered 12/18/2015 RM. The expert panel discussed the status of the population that NOAA determined is functionally extirpated. The panel requested input from the comanagers regarding population status and prior to any further deliberation over limiting factors. The population status was the reason the 2012 panel did not examine or weight limiting factors consistently. Since 2012, discussion about the population status warrants checking with the co-managers and NOAA on how to treat this population and these limiting factors going forward. The Action Agencies will await input from the co-managers and NOAA regarding future plans for this population in this AU. The co-managers will respond to action agency request for thoughts on this topic and will respond if more discussion is needed/requested. Comment entered 1/19/2016. Per M. Daniels 1/26/2016, E. Taylor and H. McRoberts (Nez Perce) agreed to table the functionally extirpated population for the process

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							Original	Updated		Original		
				2012 Standardized		Low	2018	2018	High 2018	2033	High 2033	
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	6.1: Channel Structure and Form: Bed and Channel Form	0.00%					Listinde		The expert panel discussed the status of the population that NOAA determined is functionally extirpated. The panel requested input from the c managers regarding population status and prior to any further deliberation over limiting factors. The population status was the reason the 2012 panel did not examine or weight limiting factors consistently. Since 2012, discussion about the population status warrants checking with the co- managers and NOAA on how to treat this population and these limiting factors going forward. The Action Agencies will await input from the co-managers and NOAA regarding future plan for this population in this AU. The co-managers will respond to action agency request for thought on this topic and will respond if more discussion is needed/requested. Entered 1/19/2016. Per M. Daniels 1/26/2016, E. Taylor and H. McRoberts (Nez Perce) agreed to table the functionally extirpated population for this process.
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	6.2: Channel Structure and Form: Instream Structural Complexity	30.00%	40	40	40	55		70	The expert panel discussed the status of the population that NOAA determined is functionally extirpated. The panel requested input from the c managers regarding population status and prior to any further deliberation over limiting factors. The population status was the reason the 2012 panel did not examine or weight limiting factors consistently. Since 2012, discussion about the population status warrants checking with the co- managers and NOAA on how to treat this population and these limiting factors going forward. The Action Agencies will await input from the co-managers and NOAA regarding future plan for this population in this AU. The co-managers will respond to action agency request for thought on this topic and will respond if more discussion is needed/requested. Comment entered 1/19/2016 RM. Per M. Daniels 1/26/2016, E. Taylor and H. McRoberts (Nez Perce) agreed to table the functionally extirpated population for this process

Need to review with RTT. Comment entered 12/18/2015 RM. Reviewed with that panel on 1/20/2016 and the panel proposed to combine limiting factor 6.1 with limiting factor 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 of 6.1. and 6.2. In 2016 the panel expects the results from a geomorphic assessment that they will use to 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 in the future that discussion will take place during the 2016 look forward. At this time the weighting of "0" for this limiting factor and a weighting of "30" for limiting factor 6.2 is being relied on to account for any of the benefits of actions addressing channel structure and form (6.1 and 6.2). 1/20/2016 RM.

No action. No change. Comment entered 12/18/2015 RM. Reviewed with that panel on 1/20/2016 and the panel proposed to combine limiting factor 6.1 with limiting factor 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 of 6.1. and 6.2. In 2016 the panel expects the results from a geomorphic assessment that they will use to 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 in the future that discussion will take place during the 2016 look forward. At this time the weighting of "0" for this limiting factor and a weighting of "30" for limiting factor 6.2 is being relied on to account for any of the benefits of actions addressing channel structure and form (6.1 and 6.2). 1/20/2016 RM.

							Original	Undated		Original		
				2012 Standardized		Low	2018	2018	High 2018	2033	High 2033	
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	7.2: Sediment Conditions: Increased Sediment Quantity	3.00%	70	70	70	75		80	Progress towards 2018 bookend = 93%; 2011 lev of certainty = 4.
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	8.1: Water Quality: Temperature	10.00%	34	34	34	50		60	Progress towards 2018 bookend = 68%; 16C is th 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.
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	8.4: Water Quality: Turbidity	2.00%	57	57	57	75		80	Progress towards 2018 bookend = 76%; 2011 lev of certainty = 3.

No action. No change. Comment entered 12/18/2015 RM. The expert panel discussed the status of the population that NOAA determined is functionally extirpated. The panel requested input from the comanagers regarding population status and prior to any further deliberation over limiting factors. The population status was the reason the 2012 panel did not examine or weight limiting factors consistently. Since 2012, discussion about the population status warrants checking with the co-managers and NOAA on how to treat this population and these limiting factors going forward. The Action Agencies will await input from the co-managers and NOAA regarding future plans for this population in this AU. The co-managers will respond to action agency request for thoughts on this topic and will respond if more discussion is needed/requested. Entered 1/19/2016. Per M. Daniels 1/26/2016, E. Taylor and H. McRoberts (Nez Perce) agreed to table the functionally extirpated population for this process.

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 from the co-managers and NOAA regarding future plans for this
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 request for thoughts on this topic and will respond if more discussion is
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FSII	Population	Code	Assessment Unit	2012 Standardized	I F Weight	Low	Original 2018 Estimate	Updated 2018	High 2018	Original 2033 Estimate	High 2033	IF Weight and Bookends Comments
Snake River Spring/Summer Chinook	Asotin Creek	ACC1	Asotin Creek	9.2: Water Quantity: Decreased Water Quantity	5.00%	50	50	50	80		85	Progress towards 2018 bookend = 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.
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	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 tha "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 provisio 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.
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 Tucannor 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. The expert panel discussed the status of the population that NOAA determined is functionally extirpated. The panel requested input from the comanagers regarding population status and prior to any further deliberation over limiting factors. The population status was the reason the 2012 panel did not examine or weight limiting factors consistently. Since 2012, discussion about the population status warrants checking with the co-managers and NOAA on how to treat this population and these limiting factors going forward. The Action Agencies will await input from the co-managers and NOAA regarding future plans for this population in this AU. The co-managers will respond to action agency request for thoughts on this topic and will respond if more discussion is needed/requested. Entered 1/19/2016 RM. Per M. Daniels 1/26/2016, E. Taylor and H. McRoberts (Nez Perce) agreed to table the functionally extirpated population for this process.

No barrier removal projects were identified at 2012 workshop. That said, bookend estimates assume Russell and Hartsock springs, Tumalum at and Hixion Creek projects had been addressed.

The panel has asked that the new calculation developed and calibrated for the look forward be adapted and used for the look back. 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 thus, the 1% uplift. When using the updated uplift calculator (7/20/2016) the estimate remained ~1%. 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 and revised by the expert panel 7/20/2015.

No action. No change. Comment entered 12/18/2015 RM.

							Original	Updated		Original		
				2012 Standardized		Low	2018	2018	High 2018	2033	High 2033	
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
Snake River	Tucannon River	TUC1A	Upper Tucannon - Pataha	2.3: Injury and	2.00%	96	96	96	97	96	98	Progress towards 2018 bookend = 99% (96%);
Spring/Summer			up to Panjab	Mortality: Mechanical								2011 level of certainty = 2.
Chinook				Injury								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.
Cualua Dinan	T	TUCAA	Line Torres Details		40.000/	40	10	40.25		75	75	T he second base of a data static second science.
Shake River	Tucannon River	TUCIA	Upper Tucannon - Patana	4.1: Riparian Condition:	10.00%	48	48	48.25	55	/5	/5	The panel has asked that the new calculation
Spring/Summer			up to Panjab	Riparian vegetation								developed and calibrated for the look forward be
Спіпоок												adapted and used for the look back. This refined
												improvement in righting function realized by
												2018 Additionally the new calculator reflects a
												2018. Additionally the new calculator reflects a
												Commont ontorod 7/20/2016

Estimates Comments
No projects identified at 2012 EP workshop. No action. No change.
Comment entered 12/18/2015 RM.
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.

							Original	Undated		Original		
							Original	Opuated		Original		
				2012 Standardized		LOW	2018	2018	High 2018	2033	High 2033	
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
Snake River	Tucannon River	TUC1A	Upper Tucannon - Pataha	5.2: Peripheral and	30.00%	26	26	38.32	46	50	50	
Spring/Summer			up to Panjab	Transitional Habitats:								
Chinook				Floodplain Condition								
Snake River	Tucannon River	TUC1A	Upper Tucannon - Pataha	6.1: Channel Structure	0.00%	44	44	56.87	75		85	
Spring/Summer			up to Panjab	and Form: Bed and								
Chinook				Channel Form								
								1				

The panel requested that the new calculation developed and calibrated for the look forward be adapted and used for the look back to better account for the improvement in riparian function realized by 2018. Additionally the new calculator reflects a standardized denominator for Chinook domain. The 2012 estimate was based on approx. 70 ac of floodplain being reconnected. The 2015 estimate was based on a denominator of 42 mi and a total treatment of 11.2 mi from eight projects that would influence a 12%% uplift. Projects were considered beneficial if they removed levees, riprap or added wood to improve 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, using the beneficial actions objectives included levee and rip-rap removal, placement of wood structure to reduce the bank full frequency, and reconnecting side channels. The actions using the old calculator based on project size only would have calculated a 30.3% uplift (See calculator). Based on calculations reflecting % function following the project a 12% uplift is estimated. The projects include work done in PA-1.3.10.11.14.15. 23 and 24. Projects not included is PA-22 because confinement 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 effectiveness which would be captured over time by CHaMP and AEM. The % improvement now refers to the % function not area and action effectiveness would be measured over time by CHaMP." Therefore, based on this information the calculation spreadsheet was updated such that 9.09 stream miles of treatment was made relative to the 42 miles Chinook stream miles in the Assessment Unit and the uplift changed

The panel has asked that the new calculation developed and calibrated for the look forward be adapted and used for the look back. Comment submitted by the Expert Panel 7/20/2016. 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. Comments entered 12/18/2015 RM.

FSU	Population	Code	Assessment Unit	2012 Standardized	I F Weight	Low	Original 2018 Estimate	Updated 2018 Estimate	High 2018	Original 2033 Estimate	High 2033	IF Weight and Bookends Comments
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	42.87	30	32	32	The expert panel separated this limiting factor int two metric types for evaluation. LWD per BF widt 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 43%; 2011 level of certainty = 2; 16 CHAMP sites had an average of 0.27 pieces LWD (>30 cm d and > 6 m long) per bankful width between Pataha and Panjab. The goal is for 2 pieces per bankful width so current condition in 0.27/2 towards goal or 13% which the panel believes is a pre restoration estimate due to the estimate being take before most of the restoration action were completed. Based on habitat Units metric progress towards 2018 goal was estimated at 50%; 2011 level of certainty = 2 CHaMP site had 3.6 channel units per 100 m. RTT needs to establish a goal so we can define curren condition as a % of goal; Steve M. recommends goal is a 50% increase in channel units or a goal o 5.4/100 m. Comment edited by expert panel 7/20/2016.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	7.2: Sediment Conditions: Increased Sediment Quantity	7.00%	85	85	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. Based on this progress towards the 2018 booken for ine Sediment and embeddedness was estimated at 94%; 2011 level of certainty = 2. Fine sediment values were based on one year (2011) of CHaMP data (ave 4.4%). PFC was estimated at 12% so the estimate of current (2011) condition was conservative. Embeddness based on one year (2011) of CHaMP data was an average of 13%. PFC was estimated at less than 20% so current (2011) condition was conservative.
Snake River Spring/Summer Chinook	Tucannon River	TUC1A	Upper Tucannon - Pataha up to Panjab	8.1: Water Quality: Temperature	10.00%	34	34	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 leve of certainty = 1
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 o USFS/Col Cons Dist ISCO data collected at 4 sites a and above Territorial in which there were more than 50 NTU 3% of the water year bettween 2007 2011; 2011 level of certainty = 1.

to The panel has asked that the new calculation developed and calibrated for the look forward be adapted and used for the look back. This refined estimate belter takes into account the improvement in riparian function realized by 2018. Additionally the new calculator reflects a standardized denominator for Chinook domain. Comment entered 7/20/2016.

The 2012 estimate assumed 21 of 30 mi treated. The 2015 estimate was based on a denominator of 42 mi and a total treatment of 13.39 mi from 10 projects that would influence a 13% uplift. 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 completed in 10 of the project areas. Based on rapid habitat surveys 10.86 miles of the main channel (between RM20&50) 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 an uplift 20.15 of ~13% improvement in complexity. Comment edited by expert panel 7/20/2016.

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 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.

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.

Road decommissioning projects identified to address limiting factor 8.4
 at are not likely to improve conditions further. In 2015 the panel
 determined that any project benefits were secondary and did not result
 17- in an uplift to this limiting factor. Comments entered 12/18/2015 RM.

				2012 Standardized		Low	Original 2018	Updated 2018	High 2018	Original 2033	High 2033		
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments	Estimates Comments
Snake River Spring/Summer Chinook	Tucannon Rive	r TUC1A	Upper Tucannon - Pataha up to Panjab	9.2: Water Quantity: Decreased Water Quantity	5.00%	90	90	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 and did not result in an uplift 12/18/2015 RM.
Snake River Spring/Summer Chinook	Tucannon Rive	r 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 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.	No Chinook barrier projects ic undertaken during 2012-2015 entered EWL 1/19/2016.
Snake River Spring/Summer Chinook	Tucannon Rive	r 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 look
Snake River Spring/Summer Chinook	Tucannon Rive	r 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 leve 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.	No projects identified at 2012 2015 period, therefore no upl
Snake River Spring/Summer Chinook	Tucannon Rive	r TUC1B	Lower Tucannon - Mouth to Pataha	4.1: Riparian Condition: Riparian Vegetation	10.00%	32	32	32.2	45	32	55		The panel has asked that the r for the look forward be adapt in uplift calculation reflects a improvement in function is a estimate uplift. Comment ent 7/20/2016 by expert pagel

ments	Estimates Comments
nds = 95%;2011 ne WUA at Marengo ; minimum 1 was 69 CFS, or 90 5% to 90% between	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.
d 2018 bookend = e status of limiting 2009 in a report to acknowledged that ens identified as re been almost Op was completed. tat programmatic ons to address included a provision r screened were is identified. bitat programmatic g. Comments	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.
natural origin SPC iver and ascending	LF not discussed in 2015 lookback
ad = 99%; 2011 level e status of limiting 2009 in a report to acknowledged that ens identified as re been almost Op was completed. tat programmatic ons to address included a provision r screened were is identified. Ditat programmatic g. Comments	No projects identified at 2012 EP workshop. No projects during 2012- 2015 period, therefore no uplift. Comments entered EWL 1/11/16.
	The panel has asked that the new calculation developed and calibrated for the look forward be adapted and used for the look back. The change in uplift calculation reflects a the opinion that estimating the improvement in function is a better approach that using relative area to estimate uplift. Comment entered 1/21/2016 RM and updated 7/20/2016 by expert panel.

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ESU Popular Ode Assessment Unit Umiting Factor IF Weight Bookend Estimate Bookend Estimate <th></th> <th></th> <th></th> <th></th> <th>2012 Standardized</th> <th></th> <th>Low</th> <th>2018</th> <th>2018</th> <th>High 2018</th> <th>2033</th> <th>High 2033</th> <th></th>					2012 Standardized		Low	2018	2018	High 2018	2033	High 2033	
Snake River Chinook Tucannon River TUC18 Lower Tucannon - Mouth 5.2: Perphana 30.00% 25 25 28.84 31 25 32 Tucannon River TUC18 to Pataha Transitional Habitation Chinook Tucannon River TUC18 Lower Tucannon - Mouth 6.1: Channel Structure 0.00% 54 54 57 54 54 54	ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
Spring/Summer Chinook IV Readed IV R	Snake River	Tucannon River	TUC1B	Lower Tucannon - Mouth	5.2: Peripheral and	30.00%	25	25	28.84	31	25	32	
Chinook IIII Complete Condition IIIII Complete Condition IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	Spring/Summer			to Pataha	Transitional Habitats:								
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Spring/Summer Chinook to Pataha and Form: Bed and Channel Form	Snake River	Tucannon River	TUC1B	Lower Tucannon - Mouth	6.1: Channel Structure	0.00%	54	54	57	54		54	
Chinook Channel Form	Spring/Summer			to Pataha	and Form: Bed and								
	Chinook				Channel Form								

The Tucannon River Ranch levee project was not completed and so was evaluated in the 2015 panel. CHaMP data was not used to estimate uplift because of the short time between implementation and sampling. Comments entered 1/11/2016 EWL, edited 1/21/2016 RM and updated by the expert panel 7/20/2016. It was recognized that the Tucannon Ranch project removed river levees and 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 following input: "In 2014, the CCD completed a 0.64 mile long project which removed the channel confining levees within the reach connecting the floodplain. Comment Entered 7 20-16:Only one floodplain project was completed in this assessment unit. "EWL checked the calculation necessary to conclude the "Updated 2018 Estimate" = 30.6 (low bookend=25=5.6=30.6). As per Kris's comment above: 0.64 treated miles/11.3 mainstem miles * 100=5.6%. Thus, we conclude that the project Kris is referring to is the same as the levee setback project referred to initially. EWL 3.30.16. 7-20-16 Comment: The panel has asked that the new calculation developed and calibrated for the look forward be adapted and used for the look back. The change in uplift calculation reflects a the opinion that estimating the improvement in function is a better approach than using relative area to estimate uplift. Comments entered 1/19/2016 EWL and edited 1/21/2016 RM.

The expert panel has asked that the new calculation developed and calibrated for the look forward be adapted and used for the look back. Comment submitted 7/20/2016. 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 0.6 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 is weighted at "0". See discussion above in the Limiting Factor Description. Comment entered 1/20/2016 EWL and edited 1/21/2016 RM.

				2012 Standardized		Low	Original 2018	Updated 2018	High 2018	Original 2033	High 2033	
ESU	Population	Code	Assessment Unit	Limiting Factor	LF Weight	Bookend	Estimate	Estimate	Bookend	Estimate	Bookend	LF Weight and Bookends Comments
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	19.1	45	18	45	In considering the combination of large wood and channel units for this limiting factor the panel chose to use habitat function in place river length treated. For the large wood per board feet metr progress toward 2018 bookend was estimated at 20%. Based on CHaMP data the current LWD/BF 0.36. Based on this goal (2 key pieces per board foot) progress towards 2018 goal is ~19%. Comment entered by the expert panel 7/20/216.
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	7.2: Sediment Conditions: Increased Sediment Quantity	12.00%	80	80	80	85	90	90	The expert panel separated limiting factor 7.2 int fine sediment that was weighted 3% and embeddedness that was weighted 9%. The exper panel combined these into a single weight of 12% for the limiting factor to maintain consistency wit standardized limiting factors. Based on this progress towards the 2018 booken was 94%; 2011 level of certainty = 1. For fine sediment estimates from 1 year of CHaN data estimated PFC at 12%. For embeddedness estimates from 1 year of CHaMP data estimated PFC at 20.25.
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 emigratio standard - Steve will get data from WDFW smolt trap for May and June NOTE: No bookends of estimates provided through Expert Panel.
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
Snake River Spring/Summer Chinook	Tucannon River	TUC1B	Lower Tucannon - Mouth to Pataha	9.2: Water Quantity: Decreased Water Quantity	5.00%	95	95	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

Tucannon Ranch Levee Setback (completed in 2014) benefits were evaluated in 2015. For purposes of estimating uplift the panel used the LWD per BF metric initially. The 2014 project, included 0.6 RM miles of ric levee removal and 0.35 miles of LWD placement in the developed side channel (the .6 mile was addressed under 5.2). Treating 0.35 mi out of is 11.3 mi in the AU resulted in a 3% of total length. Comment entered 1/11/16 EWL, edited 1/20/2016 RM, and revised 7/202016. Considering improvements in channel complexity function including the benefits which will arise over time the panel suggests a 1% uplift by 2018 as a result of this project. Comment added by Kris Buelow (3/25/2016). The project was the only habitat project addressing channel complexity in this assessment unit. The project completed 0.64 miles of confinement improvements (LF 5.2) on the main channel and reconnected side channels over that length. The project also did channel complexity on 0.36 miles of side channel which is accounted in this limiting factor. The panel requested that the new calculation developed and calibrated for the look forward be adapted and used for the look back to better reflect the improvements to habitat function caused by the restoration actions. Comment submitted by the expert panel 7/20/2016.

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 APP 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.

n 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.

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.

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.