

Appendix C

Supporting Materials for Bull Trout Critical Habitat Analysis

C.1 FRAMEWORK FOR ANALYSIS

Previously in the bull trout Geographic Risk Analysis, the exposure of the local populations (spawning and rearing habitat) and FMO habitats to activities on FPHCP covered lands was evaluated and ranked as high, moderate, or low risk based on the proximity and amount of overlap. Where a moderate or high exposure risk to local populations or FMO habitats was identified, there could be an increased risk from potential adverse effects from FPHCP activities to downstream or interspersed segments of critical habitat. Table 1 of the bull trout Geographic Risk Analysis displays the exposure risk rankings for bull trout local populations and FMO habitats within relevant core areas. However, all FMO habitat within a particular core area was combined and evaluated in that analysis.

Similar to the bull trout Geographic Risk Analysis, by visually estimating the amount of designated critical habitat in relation to FPHCP lands, a similar exposure risk can be applied to critical habitat. First, a visual comparison between the total amount of spawning, rearing, and FMO habitat and the total final amount of designated critical habitat was made; Second, a visual estimation of the percentage of critical habitat that was interspersed or located downstream of FPHCP lands was made; and finally, the two were combined to come up with an overall exposure risk for each critical habitat segment to potential effects from activities on FPHCP covered lands.

We assumed that all moderate to high exposure risks for critical habitat could also be subjected to an increased risk from adverse affects. Combining the information of the critical habitat exposure risk analysis and the baseline habitat condition, the overall potential risk can be scored similar to how the bull trout local populations and FMO were scored in the Geographic Risk Analysis. Scoring the critical habitat occurred by assigning H = 3, M =2, and L =1, adding them together and dividing by 2 to get the overall score or ranking.

After the initial ranking, additional GIS analysis was conducted on spawning and rearing habitat and on all FMO habitats which were ranked as moderate-high and high. The GIS analysis was at multiple scales using GIS vegetation and USGS quad maps. National Lands Cover data maps at 1:100,000 and USGS quad maps at 1:24,000 were used in a GIS exercise to look at the vegetation types in conjunction with the exclusion rules along the final critical habitat segments. This effort was to more accurately determine what amount of critical habitat actually lies between the legal end points mapped in the final listing rule. For example, if there was a segment in the final rule mapped as designated critical habitat, and the lands were agricultural or non-forested vegetation based on the two maps, then the segment was considered to be critical habitat. However, if a segment was mapped as critical habitat but had forested vegetation, then it should have likely been excluded by at least one of the exclusions in the final designation. Note that some segments of streams that were depicted as excluded in the listing had sections of land that appear to be non-forested based on GIS layers, and therefore, should likely not have been excluded in the final designation. This is likely due to different scale maps and different GIS coverages used to estimate the final designation. Also, this GIS exercise helped to refine what the level of exposure would be, based on how close the FPHCP lands were located to segments of critical habitat. For example, if FPHCP covered lands closely surrounded a critical habitat segment, or were interspersed among segments, these segments were determined to be exposed to FPHCP lands and a percentage of that exposure was estimated.

C.1.1 Item 1: Additional Analysis for Middle Columbia River Basin: Unit 20

C.1.1.1 Baseline condition

Spawning and rearing critical habitat is located within the mainstem Yakima River upstream of Easton Lake Dam to Keechelus Dam. FMO critical habitat is located from the mouth up to Easton Dam (just below Kachess River) and there are exclusions applied in portion of both the spawning and rearing and FMO reaches. In the Naches River there are segments of FMO critical habitat identified from the mouth upstream to the confluence of the Bumping River and there are some exclusions that apply in the upper portion of the reach and in a few interspersed segments. Segments of FMO critical habitat are located in the tributaries to the Naches River, Bumping River and Tieton River; and segments of spawning and rearing critical habitat are located within the Tieton River and Rattlesnake Creek, and NF Tieton River. Both have large interspersed segments that are excluded. In Ahtanum Creek, segments of spawning and rearing critical habitat are designated in the mainstem generally upstream from the confluence of the North and South Forks; while there are only segments of FMO critical habitat within the mainstem Ahtanum Creek, and in the North Fork and South Fork where large segments are excluded. In the Teanaway River segments of spawning and rearing and FMO critical habitat are located generally within the mainstem from the confluence with the NF Teanaway and upstream to a barrier falls; spawning and rearing critical habitat is located in Jungle and Jack Creeks; and FMO critical habitat is located in the Teanaway mainstem and the Middle Fork. Exclusions occur in most of the NF Teanaway, segments of Jungle and Jack Creeks, and in a small segment of the mainstem Teanaway. In the Cle Elum River system segments of FMO critical habitat are located within the mainstem both above and below Cle Elum Lake and within the Cooper River system below Cle Elum Lake, with some exclusions interspersed. Segments of spawning and rearing critical habitat are located upstream of Cle Elum Lake and with some small interspersed segments in both the Cle Elum River and Cooper River. In the Kachess River spawning and rearing and FMO critical habitat is located between the mouth and the Dam at Kachess Lake and upstream of the lake in the Kachess River and in Box Canyon Creek. Some FMO critical habitat segments are downstream of the lake, however, most segments have been excluded. In Gold Creek, spawning and rearing critical habitat is almost all excluded. All other areas that contained bull trout habitat were completely excluded in the final rule. See Table I, which shows the BT matrix and the habitat conditions overlapped with the PCEs and the overall critical habitat condition ranking.

C.1.1.2 Effects Section

Further FMO analysis of the individual stream systems, reveals that individually the Naches, Tieton, N. Fork Tieton, Kachess, Cle Elum, Teanaway and the N. Forks Teanaway River FMOs, and the mainstem Yakima River rank high because it was estimated that there were greater than 40 percent adjacent FPHCP lands. Bumping River (below the dam) ranked low, having only 10 percent adjacent FPHCP lands.

Our analysis indicates spawning and rearing critical habitat segments in the action area are at high risk of exposure in Ahtanum Creek and its tributaries, mainstem Yakima River, and the Teanaway River and its tributaries; and are at moderate risk of exposure in Rattlesnake Creek and Gold

Creek; but are at low risk in Cle Elum River and its tributaries and NF Tieton Rivers. In addition, FMO critical habitat segments are at high risk of exposure in the Ahtanum Creek, Naches, Tieton, Yakima, Teanaway, Cle Elum, and Kachess Rivers, while the FMO critical habitat segments are at low risk in the Bumping River. There were no FPHCP lands interspersed or upslope of spawning and rearing critical habitat segments in Box Canyon Creek or in upper Kachess River. See Table J for the exposure ranking for the Middle Columbia CHU.

In terms of the preliminary ranking of overall potential risk from potential adverse effects, spawning and rearing critical habitat segments in Ahtanum Creek and its tributaries, the Teanaway River and its tributaries, and the upper mainstem Yakima River are at a high risk; and Gold Creek and Cle Elum and its tributaries are at a moderate risk. The NF Tieton is at a low risk to potential adverse effects to spawning and rearing critical habitat. In terms of the overall potential risk from potential adverse effects to FMO critical habitat segments, Ahtanum Creek, Cle Elum, Kachess, Naches, Teanaway, Tieton, and upper mainstem Yakima Rivers are at high risk; Rattlesnake Creek is at a moderate-high risk; and the Bumping River is at moderate risk for adverse affects. Table A shows a combination of the exposure risk of the local populations and FMO habitat, and the critical habitat baseline condition to give an initial ranking in terms of the overall potential risk of critical habitat from potential adverse affects.

Additional GIS analysis was conducted on Ahtanum, Teanaway, and Upper Yakima spawning and rearing habitat and on all FMO habitats to double check the exposure risk and overall potential risks of these critical habitat segments that were identified above in Table A as moderate-high and high overall potential risks.

Table A. Preliminary Overall Potential Risk for Middle Columbia River Critical Habitat. Moderate and high risk categories are at significant risk to potential adverse effects.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating*		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
Ahtanum (including the NF and SF) S/R	H	3	H	3	HH	3
Teanaway (including NF, Jungle, Jack Cr) S/R	H	3	H	3	HH	3
Upper Yakima S/R	H	3	H	3	HH	3
Gold S/R	M	2	M	2	MM	2
Cle Elum (including Cooper and Waptus R) S/R	L	1	H	3	LH	2
NF Tieton S/R	L	1	M	2	LM	1.5
Foraging Migration and Overwintering CH						
Cle Elum FMO	H	3	H	3	HH	3
Kachess FMO	H	3	H	3	HH	3
Naches FMO	H	3	H	3	HH	3
Teanaway FMO	H	3	H	3	HH	3
Tieton FMO	H	3	H	3	HH	3
Upper Yakima FMO	H	3	H	3	HH	3
Ahtanum FMO	H	3	H	3	MH	3
Rattlesnake FMO	M	2	H	3	MH	2.5
Bumping FMO	L	1	H	3	LH	2

Table B is a summary of the refined final overall potential risk rankings that will be carried forward in the BO. Spawning and rearing segments in the Ahtanum, Teanaway, and Upper Yakima remain at a high risk. Further review of Rattlesnake Creek determined that it was a spawning and rearing segment and not FMO habitat, and that it was at moderate risk along with Gold Creek. All FMO except Bumping River remained at high risk. See Table K for validation of the exposure ranking of these critical habitat segments.

Table B. Final Overall Potential Risk for Middle Columbia River Critical Habitat.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
Ahtanum S/R (including the NF and SF)	H	3	H	3	HH	3
Teanaway S/R (including NF, Jungle, Jack Cr)	H	3	H	3	HH	3
Upper Yakima S/R	H	3	H	3	HH	3
Gold Cr S/R	M	2	M	2	MM	2
<i>RattleSnake Creek S/R</i>	<i>M</i>	<i>2</i>	<i>M</i>	<i>2</i>	<i>MM</i>	<i>2</i>
Cle Elum S/R (including Cooper and Waptus R)	L	1	H	3	LH	2
NF Tieton S/R	L	1	M	2	LM	1.5
Foraging Migration and Overwintering CH						
Cle Elum FMO	H	3	H	3	HH	3
Kachess FMO	H	3	H	3	HH	3
Naches FMO	H	3	H	3	HH	3
Teanaway FMO	H	3	H	3	HH	3
Tieton FMO	H	3	H	3	HH	3
Upper Yakima FMO	H	3	H	3	HH	3
Ahtanum FMO	H	3	H	3	HH	3
<i>Rattlesnake FMO</i>	<i>M</i>	<i>2</i>	<i>H</i>	<i>3</i>	<i>MH</i>	<i>2.5</i>
Bumping FMO	L	1	H	3	LH	2
Moderate-high and high risk categories are at significant risk to potential adverse effects that can affect the functional suitability of PCEs (Italic/italic strikeout is additions/deletions due to the detailed analysis).						

C.1.2 Item 2: Additional Analysis for NE Washington River Basins: Unit 22

C.1.2.1 Baseline condition

FMO critical habitat is located in Calispell Creek downstream of Small Creek. In Cedar Creek, there are segments of critical habitat located near the mouth and midway upstream, with excluded segments in between and upstream. In Indian Creek, there are critical habitat segments interspersed with excluded segments. In LeClerc Creek, East and West Branch LeClerc Creek, and Fourth of July Creek, there are segments of spawning and rearing critical habitat, with many excluded segments interspersed and

upstream and downstream. No FMO critical habitat segments remain on LeClerc Creek after exclusions. In Mill Creek, segments of spawning and rearing critical habitat are located near the creek mouth, with exclusions upstream. In Ruby Creek, segments of spawning and rearing critical habitat are located in the lower half of the stream, and are interspersed with large excluded segments. In SF Tacoma Creek, segments of spawning and rearing critical habitat are located near the mouth and in its headwaters, with large excluded segments interspersed in between. In Tacoma Creek, segments of spawning and rearing critical habitat and FMO critical habitat are located near the mouth and in its headwaters with large exclusions interspersed in between. In Slate Creek, spawning and rearing critical habitat segments are located near the mouth, with large excluded segments upstream. In Small Creek, segments of spawning and rearing critical habitat and FMO critical habitat are located from the mouth to the EF Small Creek and within the lower portion of the East Fork, with some interspersed excluded segments in the EF Small Creek. In Sullivan Creek, only segments of FMO critical habitat remain, while no spawning and rearing segments appear designated after the exclusions. See Table I, which shows the BT matrix and the habitat conditions overlapped with the PCEs and the overall critical habitat condition ranking. The overall discussion of the crosswalk to the PCEs is located in Appendix D.

C.1.2.2 Effects Section

Further FMO analysis, of the individual stream systems, reveals that Calispell, SF Tacoma, Sullivan, and Tacoma FMOs also rank high because of the large amount or high exposure to FPHCP covered lands (estimated at greater than 40 percent adjacent FPHCP lands).

Our analysis indicates spawning and rearing critical habitat segments in the action area are at high risk of exposure in LeClerc, Indian, SF Tacoma, and Small Creeks; and are at moderate risk of exposure in all other spawning and rearing areas, but are at low risk of exposure in Mill Creek. In addition, FMO critical habitat segments are at high risk of exposure in Calispell, SF Tacoma, and Small Creeks; and are at a moderate risk of exposure in Tacoma Creek, and at low risk in Ruby Creek. See Table J for the exposure ranking for critical habitat.

In terms of the preliminary ranking of overall potential risk from potential adverse effects, spawning and rearing critical habitat segments in LeClerc including the East Branch and West Branch LeClerc Creeks and Fourth of July Creeks are at high risk; Indian Creek, Small Creek including EF Small Creek, SF Tacoma Creek, and Tacoma Creek are at moderate-high risk; and Cedar and Mill Creeks are at moderate risk. In terms of the overall potential risk to potential adverse effects to FMO critical habitat, Calispell Creek, SF Tacoma Creek, and Tacoma Creek are at high risk; Sullivan Creek is at moderate-high risk; and Ruby Creek is at moderate risk. Table C shows a combination of the exposure risk of the local populations and FMO habitat, and the critical habitat baseline condition to give an initial ranking in terms of the overall potential risk of critical habitat to potential adverse affects.

Further GIS analysis was conducted on LeClerc, Indian, Small, SF Tacoma, and Tacoma Creek spawning and rearing habitat and on all FMO habitats to double check the exposure risk and overall potential risks of these critical habitat segments that were identified above in Table C as moderate-high and high overall potential risks.

Table C. Preliminary Overall Potential Risk for NE Washington River Basins Critical Habitat.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating*		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
LeClerc Cr S/R (including E. Branch and W. Branch LeClerc Cr, Fourth of July Cr)	H	3	H	3	HH	3
Indian Cr S/R	H	3	M	2	HM	2.5
Small Cr (including EF Small Cr)	H	3	M	2	HM	2.5
SF Tacoma Cr S/R	H	3	M	2	HM	2.5
Tacoma Cr S/R	M	2	H	3	MH	2.5
Cedar Cr S/R	M	2	M	2	MM	2
Mill Cr S/R	L	1	H	3	LH	2
Foraging Migration and Overwintering CH						
Calispell Cr FMO	H	3	H	3	HH	3
SF Tacoma Cr FMO	H	3	H	3	HH	3
Tacoma Cr FMO	H	3	H	3	HH	3
Sullivan Cr FMO	M	2	H	3	MH	2.5
Ruby Cr FMO	L	1	H	3	LH	2
Moderate and high risk categories are at significant risk to potential adverse effects.						

Table D summarizes the refined overall rankings from the additional GIS analysis. Spawning and rearing critical habitat segments in Tacoma Creek moved up to a overall high risk; in LeClerc Creek they moved to a moderate-high risk; while Indian, Small, and SF Tacoma Creeks they moved to a moderate risk along with Cedar and Mill Creeks. Further review of Ruby Creek determined that it was a spawning and rearing segment and not a FMO segment, and that it was at moderate risk. Slate Creek was determined to have an exposed segment of spawning and rearing critical habitat, which was at a moderate risk. Segments of FMO critical habitat in Calispell Creek remained at an overall high risk, and Sullivan Creek remained at a moderate-high overall risk. Tacoma Creek FMO critical habitat moved to a moderate-high overall risk. Additionally, Small Creek was determined to have segments of FMO critical habitat at an overall high risk, and LeClerc Creek was determined to have segments of FMO critical habitat at an overall moderate-high risk. Further review of SF Tacoma Creek and Ruby Creek determined there are apparently no FMO critical habitat segments. See Table K for validation of the exposure ranking of these critical habitat segments.

Table D. Final Overall Potential Risk for NE Washington River Basins Critical Habitat.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating*		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
Tacoma Cr S/R	H	3	H	3	HH	3
LeClerc Cr S/R (including E. Branch and W. Branch LeClerc Cr, Fourth of July Cr)	M	2	H	3	HM	2.5
Indian Cr S/R	M	2	M	2	MM	2
Small Cr S/R (including the EF Small Cr)	M	2	M	2	MM	2
SF Tacoma Cr S/R	M	2	M	2	MM	2
Cedar Cr S/R	M	2	M	2	MM	2
<i>Ruby Cr S/R</i>	<i>M</i>	2	<i>M</i>	2	<i>MM</i>	2
<i>Slate Cr S/R</i>	<i>M</i>	2	<i>M</i>	2	<i>MM</i>	2
Mill Cr S/R	L	1	H	3	LH	2
Foraging Migration and Overwintering CH						
Calispell Cr FMO	H	3	H	3	HH	3
SF Tacoma Cr FMO	H	3	H	3	LM	3
<i>Small Cr FMO</i>	<i>H</i>	3	<i>H</i>	3	<i>HH</i>	3
Tacoma Cr FMO	M	2	H	3	MH	2.5
Sullivan Cr FMO	M	2	H	3	MH	2.5
<i>Le Clerc Cr FMO</i>	<i>M</i>	2	<i>H</i>	3	<i>MH</i>	2.5
Ruby Cr FMO	L	1	H	3	LH	2
Moderate-high and high risk categories are at a significant risk to potential adverse effects that can affect the functional suitability of PCEs (<i>Italic/Italic strikeout</i> is additions/deletions due to the detailed analysis).						

C.1.3 Item 3: Additional Analysis for Umatilla -Walla Walla Unit: Unit 9

C.1.3.1 Baseline condition

Segments of spawning and rearing critical habitat are located within the Walla Walla River and within its tributary, Mill Creek. Additionally, segments of spawning and rearing critical habitat are located in the Touchet River system within the NF Touchet, Lewis and Spangler Creeks; and within the SF Touchet. Segments of FMO critical habitat are located in the Walla Walla mainstem, Mill Creek mainstem, Yellowhawk Creek off of lower Mill Creek; the Touchet system the mainstem Touchet, North and South Forks of the Touchet; and within the Wolf Fork Touchet. All other areas that contained bull trout habitat were completely excluded in the final rule. See Table I, which shows the BT matrix and the habitat conditions overlapped with the PCEs and the overall critical habitat condition ranking. The overall discussion of the crosswalk to the PCEs is located in Appendix D.

C.1.3.2 Effects Section

Further FMO analysis of the individual stream systems, reveals that individually FMO in the Mill Creek, Walla Walla, North and South Forks of the Touchet and the Wolf Fork areas also rank high because there were greater than 40 percent adjacent FPHCP lands. Wolf Fork Touchet ranked out as a moderate with 20 percent adjacent FPHCP lands.

Our analysis indicates spawning and rearing critical habitat segments in the action area are at high risk of exposure in Mill Creek and the NF Touchet and its tributaries. In addition, FMO critical habitat segments are at moderate high to high risk of exposure in all the FMO areas. See Table J for the exposure ranking for the Umatilla-Walla Walla CHU.

In terms of the preliminary ranking of overall potential risk from potential adverse effects, spawning and rearing critical habitat segments in Mill Creek and NF Touchet are at high risk and at moderate risk in the SF Touchet. The overall risk to potential adverse effects to FMO critical habitat segments in Mill Creek and SF Touchet are at high risk and in Wolf Fork and NF Touchet areas are at moderate-high risk. Table E shows a combination of the exposure of the local populations and FMO habitat and the critical habitat baseline condition ratings to give a final ranking in terms the overall condition.

Table E. Preliminary Overall Potential Risk for Umatilla-Walla Walla River Basins Critical Habitat.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating*		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
Mill Cr S/R	M	2	H	3	MH	2.5
NF Touchet S/R	H	3	M	2	MH	2.5
SF Touchet S/R	H	3	M	2	MH	2.5
Foraging Migration and Overwintering CH						
Mill Cr FMO	H	3	H	3	HH	3
SF Touchet FMO	H	3	H	3	HH	3
NF Touchet FMO	M	2	H	3	MH	2.5
Wolf Fork Touchet FMO	M	2	H	3	MH	2.5
Moderate and high risk categories are at significant risk to potential adverse effects.						

Further GIS analysis was conducted on Mill Creek and NF Touchet spawning and rearing habitat and on all FMO habitat to double check the exposure risk and overall potential risks of these critical habitat segments that were identified above in Table E as moderate-high and high overall potential risks.

Table F summarizes the refined overall exposure rankings from the GIS analysis. Spawning and rearing critical habitat segments in Mill Creek and NF Touchet are at an overall moderate-high risk. Further review of the SF Touchet determined that it was a spawning and rearing segment with exposure, and that it was at an overall moderate risk. All FMO critical habitat segments remain at moderate-high or high risk. See Table K for validation of the exposure ranking of these critical habitat segments.

Table F. Final Overall Potential Risk for Umatilla-Walla Walla River Basins Critical Habitat.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating*		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
Mill Cr S/R	M	2	H	3	MH	2.5
NF Touchet S/R	H	3	M	2	MH	2.5
<i>SF Touchet S/R</i>	<i>M</i>	2	<i>M</i>	2	<i>MM</i>	2
Foraging Migration and Overwintering CH						
Mill Cr FMO	H	3	H	3	HH	3
SF Touchet FMO	H	3	H	3	HH	3
NF Touchet FMO	M	2	H	3	MH	2.5
Wolf Fork Touchet FMO	M	2	H	3	MH	2.5

Moderate-high and high risk categories are at a significant risk to potential adverse effects that can affect the functional suitability of PCEs (*Italic/Italic strikeout* is additions/deletions due to the detailed analysis).

C.1.4 Item 4: Additional analysis for Puget Sound and Lower Columbia Units

C.1.4.1 Baseline Section

See Table I, which shows the BT matrix and the habitat conditions overlapped with the PCEs and the overall critical habitat condition ranking. The overall discussion of the crosswalk to the PCEs is located in Appendix D.

C.1.4.2 Effects Section

Table 1, of the bull trout Geographic Risk Analysis displays the exposure risk rankings for local populations and FMO habitats within the Puget Sound and Lewis River core area. Further FMO analysis of the individual stream systems, reveals that FMO areas in the Carbon, Puyallup, NF Stillaguamish, Stillaguamish, SF Nooksack, Nooksack, and Klickitat areas also rank high because of poor habitat conditions and moderate-high or high exposure (estimated at 20 to 40 percent adjacent FPHCP lands).

Additional GIS analysis was conducted on spawning and rearing and FMO habitat within the Puyallup, Nooksack, Stillaguamish, Snohomish/Skykomish, and Klickitat core areas to double check the exposure risk and overall potential risks of these critical habitat segments that were identified above in Table A as moderate-high and high overall potential risks.

Our analysis indicates spawning and rearing critical habitat segments in the action area are at high risk of exposure in Lower SF Nooksack and NF Stillaguamish local populations; at moderate risk of exposure in SF Stillaguamish, Lower NF Nooksack (including Maple Creek), and Lower MF Nooksack local populations; but is at low risk of exposure in the Carbon River local population. In addition, FMO critical habitat segments are at high risk of exposure in Carbon River, mainstem Puyallup, NF Stillaguamish, mainstem Stillaguamish, SF Nooksack, mainstem Nooksack, and Klickitat Rivers, and is at a moderate risk of exposure in all other FMO critical habitat stream segments. See Table K for validation of the exposure ranking of these critical habitat segments.

In terms of the of overall potential risk to potential adverse effects, spawning and rearing critical habitat segments in Lower SF Nooksack are at high risk; in the NF Stillaguamish are at moderate-high risk; SF Stillaguamish and Lower NF Nooksack, Lower MF Nooksack, and Upper MF Nooksack are at moderate risk; and Carbon River is at low risk. In terms of the overall potential risk to potential adverse effects to FMO critical habitat segments, Carbon, Puyallup, Klickitat Rivers are at high risk; NF Stillaguamish, Stillaguamish, SF Nooksack, and Nooksack are at moderate-high risk; and Deer Creek, Canyon Creek, White River, SF Stillaguamish River, and Lower NF Nooksack (including Kendall Creek) are at moderate risk. Table G shows a summary of the exposure risk of the local populations and FMO habitat, and the critical habitat baseline condition to give a final ranking in terms of the overall potential risk of critical habitat to adverse affects.

Table G. Final Overall Potential Risk for the Puget Sound Critical Habitat.

CHU Name/function	CHU Exposure Risk		CHU Habitat Rating*		Overall Potential Risk	
	rank 1	score 1	rank 2	score 2	rank 3	score 3
Spawning/Rearing CH						
Lower SF Nooksack S/R	H	3	H	3	HH	3
NF Stillaguamish S/R	H	3	M	2	HM	2.5
SF Stillaguamish S/R	M	2	M	2	MM	2
Lower NF Nooksack S/R (including Maple Cr)	M	2	M	2	MM	2
Lower MF Nooksack S/R	M	2	M	2	MM	2
Upper MF Nooksack S/R	M	2	M	2	MM	2
Carbon S/R	L	1	L	1	LL	1
Foraging Migration and Overwintering CH						
Carbon River FMO	H	3	H	3	HH	3
Puyallup FMO	H	3	H	3	HH	3
Klickitat River FMO	H	3	H	3	HH	3
NF Stilliguamish FMO	H	3	M	2	HM	2.5
Stilliguamish FMO	H	3	M	2	HM	2.5
SF Nooksack FMO	H	3	M	2	HM	2.5
Nooksack FMO	H	3	M	2	HM	2.5
White River FMO	M	2	M	2	MM	2
Deer Cr FMO	M	2	M	2	MM	2
Canyon Cr FMO	M	2	M	2	MM	2
SF Stilliguamish FMO	M	2	M	2	MM	2
Lower NF Nooksack (Kendall Cr) FMO	M	2	M	2	MM	2
Lower Skagit FMO	M	2	M	2	MM	2
Moderate-high and high risk categories are at a significant risk to potential adverse effects that can affect the functional suitability of PCEs.						

C.1.5 Item 5: CHU Habitat Analysis for Unstable Slopes, Soils, Rain on Snow Areas, and Roads.

Within areas where we had a moderate high or high overall potential risk we reviewed road density, unstable slopes and high slope hazard areas, soil types, and rain on snow areas using multiple scale maps from WDNR. We anticipated that the magnitude of potential effects may be higher in areas where certain conditions exist that may tend to assist with the movements of sediments, wood, and alter riparian, stream temperature, and channel conditions. A summary of these conditions within areas of moderate-high and high overall potential risks are displayed in Table H.

Table H: Summary of Selected Watershed Characteristics of High and Moderate-High Risk Local populations and Critical Habitat Areas.

Core Area	Local Population or CH	ROS			High Slope Instability		31-49% Slope		Erosion Potential
		% in LP	% CH in LP	% CH in FMO	LP	FMO	LP	FMO	
Walla-Walla	SF Touchet	90	100	20	H	n/a	M	n/a	M
Yakima	Ahtanum Creek and CH ²	50	70	25	L	L	L	M	M
Yakima	Teanaway River and CH ²	40	90	25	L	L	M	M	H
Yakima	Upper Yakima and CH ²	100	100	25	L	L	L	M	M
Wenatchee	Nason Creek	10	0	0	L	n/a	H	n/a	H
Entiat	Entiat River	20	0	0	L	n/a	H	n/a	H
Walla-Walla	NF Touchet and CH ²	80	90	20	L	M	H	L	M
Walla-Walla	Wolf Fork Touchet	60	0	20	H	n/a	M	n/a	M
Pend Oreille	Le Clerc Creek and CH ²	30	90	70	M	L	L	L	M
Yakima	Gold Creek	0	0	25	L	n/a	M	n/a	H
Wenatchee	White River	10	0	0	L	n/a	H	n/a	M
Entiat	Mad River	30	0	0	L	n/a	H	n/a	H
Stillaguamish	Upper Deer Creek	80	40	0	H	n/a	M	n/a	M
Yakima	Cle Elum River	60	90	25	M	n/a	M	n/a	H
Wenatchee	Little Wenatchee River	0	0	0	L	n/a	M	n/a	M
Wenatchee	Peshastin Creek	0	0	0	L	n/a	H	n/a	M
Methow	Goat Creek	30	0	0	L	n/a	M	n/a	M
Methow	Gold Creek	30	0	0	L	n/a	M	n/a	H
Pend Oreille	Tacoma Creek CH	10	100	70	L	L	L	M	M
Nooksack	SF Nooksack CH	20	10	30	L	M	M	L	M
Nooksack	MF Nooksack CH	20	100	0	L	n/a	M	n/a	M
Walla-Walla	Mill Creek CH	100	100	10	L	L	M	L	M
Stillaguamish	NF Stillaguamish CH	10	10	0	M	M	M	L	H

Additional watershed condition analysis information for the Umatilla-WallaWalla River Basins CHU

Within the critical habitat areas where we had a moderate-high or high overall risk in Mill Creek and NF Touchet local populations and FMO habitats we looked at more site specific watershed conditions for rain on snow, soils, slope steepness and slope hazards, geology, and roads using additional GIS support. In Mill Creek and NF Touchet there is 80-100% of the local population in a rain on snow zone with 90-100% of the segments of spawning and rearing critical habitat affected; low slope instability and low to high amount of steep slopes in the local population exists, and the geology in the watershed has a moderate potential for soil erosion. Additionally 10-20% of the FMO is in a rain on snow zone; and has low-moderate amounts of slope instability and low amounts of steep slopes. The geology in the watersheds has a moderate potential for soil erosion. Road density on FPHCP lands in the Mill Creek local population is 5.07 miles per square mile with 2.49 miles of riparian road miles on FPHCP lands. In the NF Touchet miles local population there are 2.85 miles per square mile with 6.93 miles of riparian road miles on FPHCP lands. The magnitude of effects of the implementation of the FPHCP will likely be higher in these kinds of areas which tend to assist with the movements of sediments, wood, and alter riparian and channel conditions that cause changes in stream temperatures.

Additional watershed condition analysis information for the Middle Columbia River Basin CHU

Within the critical habitat areas where we had a high overall risk in the local populations (i.e., Ahtanum Creek, Teanaway River, and upper Mainstem Yakima) and FMO habitats, we looked at more site specific watershed conditions for rain on snow, soils, slope steepness and slope hazards, geology, and roads using additional GIS analyses. In Ahtanum Creek, 50% of the local population is in a rain on snow zone with 70% of the segments of spawning and rearing critical habitat affected. Low amounts of unstable slopes and steep slopes exist within the local population, but the geology in the watershed has a moderate potential for soil erosion. In the Teanaway River, 40% of the local population is in a rain on snow zone with 90% of the segments of spawning and rearing critical habitat affected. Low amounts of unstable slopes but moderate amounts of steep slopes exist within the local population, and the geology has a high potential for soil erosion. In the upper Mainstem Yakima local population, 100% of the local population is in a rain on snow zone with 100% of the segments of spawning and rearing critical habitat affected. Low amounts of unstable slopes and steep slopes exist within the local population, but the geology has a moderate erosion potential. Additionally, 25% of the FMO habitat is in a rain on snow zone and has low amounts of unstable slopes with moderate amounts of steep slopes. The geology in the watersheds has a moderate to high potential for soil erosion. Road density on FPHCP lands in the Ahtanum Creek local population is 3.34 miles per square mile with 24.75 miles of riparian road miles on FPHCP lands. In the Teanaway River potential local population, there are 2.01 miles per square mile with 14.47 miles of riparian road miles on FPHCP lands. The magnitude of effects of the implementation of the FPHCP will likely be higher in these types of areas which tend to assist with the movements of sediments, wood, and alter riparian and channel conditions that cause changes in stream temperatures.

Additional watershed condition analysis information for the NE Washington River Basins CHU

Within the critical habitat areas where we had a moderate-high or high overall risk in the local populations (i.e., LeClerc Creek and Tacoma Creek) and FMO habitats, we looked at more site specific watershed conditions for rain on snow, soils, slope steepness and slope hazards, geology, and roads using additional GIS analysis. In LeClerc Creek, 30% of the local population is in a rain on snow zone with 90% of the segments of spawning and rearing critical habitat affected. Moderate slope instability and low

amount of steep slopes exist within the local population, and the geology in the watershed has a moderate potential for soil erosion. In Tacoma Creek, 10% of the local population is in a rain on snow zone with 100% of the segments of spawning and rearing critical habitat affected. Low slope instability and low amounts of steep slopes exist within the local population. Additionally, 70% of the FMO habitat is in a rain on snow zone; and has low amounts of slope instability and steep slopes. The geology in the watersheds has a moderate potential for soil erosion. Road density on FPHCP lands in the LeClerc Creek local population is 3.17 miles per square mile with 6.15 miles of riparian road miles on FPHCP lands. In the Tacoma Creek potential local population, there are 2.82 miles per square mile with 0.72 miles of riparian road miles on FPHCP lands. The magnitude of effects of the implementation of the FPHCP will likely be higher in these types of areas which tend to assist with the movements of sediments, wood, and alter riparian and channel conditions that cause changes in stream temperatures.

Additional watershed condition analysis information for the Puget Sound CHU

Within the critical habitat areas where we had a moderate-high or high overall risk in S.Fork Nooksack, M. Fork Nooksack, and N.Fork Stillaguamish local populations and in FMO habitats in the Puyallup River, Carbon River, Nooksack River, M. Fork Nooksack, S.Fork Nooksack River, Stillaguamish River, and N. Fork Stillaguamish River we looked at more site specific watershed conditions for rain on snow, soils, slope steepness and slope hazards, geology, and roads using additional GIS support. In S. Fork Nooksack there is 20% of the local population in a rain on snow zone with 10% of the critical habitat spawning and rearing segments affected; and it has low amounts of unstable slopes but moderate amounts of steep slopes; and the geology in the watershed has a moderate erosion potential. In the M.Fork Nooksack there is 20% of the local population in a rain on snow zone but with 100% of the spawning and rearing critical habitat segments affected; it has low amounts of unstable slopes but moderate amounts of steep slopes; and the geology has a moderate erosion potential. In the N.Fork Stillaguamish there is 10% of the local population in a rain on snow zone and only 10% of the spawning and rearing critical habitat segments affected; it has moderate amounts of unstable and steep slopes, and a geology with a high potential for soil erosion. Additionally, 30% of the SFork Nooksack FMO is in a rain on snow zone and all FMO is has a moderate amount of unstable and steep slopes; and has a geology of moderate to high potential for soil erosion. Road density on FPHCP lands in the S.Fork Nooksack local population is 4.49 miles per square mile with 32.72 miles of riparian road miles on FPHCP lands. In the M.Fork Nooksack local population there are 3.53 miles per square mile with 6.82 miles of riparian road miles on FPHCP lands. In the N.Fork Stillaguamish local population there are 4.19 miles per square mile of roads on FPHCP lands with 6.77 miles of riparian road miles on FPHCP lands. The magnitude of effects of the implementation of the FPHCP will likely be higher in these kinds of areas which tend to assist with the movements of sediments, wood, and alter riparian and channel conditions that cause changes in stream temperatures.

C.1.6 Item 6: BT habitat matrix with PCE crosswalk

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Yakima	Ahtanum Creek (includes N. and S. Forks)		Ahtanum S/R	H	H	H	M	H	H	H	H	H	H	H
			Ahtanum FMO		H	H	M	H	H	H	H	H	H	H
	American River*		n/a	M	n/a	L	L	M	M	M	L	M	L	n/a
	Box Canyon		Box Canyon S/R	L	n/a*	M	H	M	M	H	M	M	M	n/aA
	Bumping River		Bumping S/R	L	n/a*	H	H	M	H	H	M	H	H	n/a
			Bumping FMO		L	H	M	H	H	H	H	H	H	H
	Cle Elum River (includes Cooper and Waptus population)		Cle Elum S/R	M	L	H	H	M	M	H	H	H	H	H
			Cle Elum FMO		H	H	M	H	H	H	H	H	H	H
	Crow Creek		n/a	L	n/a	M	L	M	L	L	M	M	M	n/a

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Yakima (continued)	Deep Creek		n/a	L	n/a	L	H	L	H	L	M	M	M	n/a
	Gold Creek		Gold S/R	H	M	M	H	M	H	H	L	M	M	M
	Indian Creek		n/a	L	n/a	L	H	M	M	L	L	M	M	n/a
	Kachess River		Kachess S/R	L	n/a	M	H	M	H	M	H	M	M	n/a
			Kachess FMO		H	H	M	H	H	H	H	H	H	H
	Teanaway River (includes tribs & NF Teanaway)		Teanaway S/R	H	H	H	H	H	H	H	H	M	H	H
			Teanaway FMO		H	H	M	H	H	H	H	H	H	H
	NF Tieton River		NF Tieton S/R	L	L	M	H	M	M	M	M	H	M	M
	Rattlesnake Creek		Rattlesnake S/R	M	M	M	M	M	M	M	M	M	M	M
			Rattlesnake FMO		n/a									n/a
	SF Tieton River		n/a	H	n/a	M	H	M	M	M	H	M	M	n/a
	Upper Yakima River		upper mainstem Yakima S/R	H	H	H	H	H	H	H	H	H	H	H
			upper mainstem Yakima FMO		H	H	M	H	H	H	H	H	H	H
			Naches FMO		H	H	M	H	H	H	H	H	H	H

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Yakima (continued)			Tieton FMO		H	H	M	H	H	H	H	H	H	H
	Taneum Creek (Potential local population)		n/a	M	n/a	H	H	M	M	M	H	H	H	n/a
		**** Yakima River (sum all FMO for core area)		H	n/a	H	M	H	H	H	H	H	H	n/a
Pend Oreille			Calispell Cr FMO		H	H	H	H	H	H	H	H	H	H
	Cedar Creek PLP		Cedar Cr S/R	M	M	M	H	M	M	M	M	H	H	M
	Harvey Creek PLP*		n/a	M	n/a	M	H	M	M	M	M	H	H	n/a
	Indian Creek PLP		Indian Cr S/R	H	M	M	M	M	M	M	M	H	H	M
	Le Clerc Creek		Le Clerc Cr S/R (including E. Branch and W. Branch LeClerc Cr, Fourth of July Cr)	H	M	M	M	H	M	M	H	H	H	H
			Le Clerc Cr FMO		M	H	H	H	H	H	H	H	H	H

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Pend Oreille (continued)	Mill Creek PLP		Mill Cr S/R	L	L	M	H	H	H	H	H	H	H	H
	Ruby Creek PLP		Ruby Cr S/R	L	M	M	M	H	H	M	H	M	M	M
			Ruby Cr FMO		n/a	H	H	H	H	H	H	H	H	n/a
	Slate Creek PLP		Slate Cr S/R	L	M	M	M	H	H	H	M	M	M	M
			Slate Cr FMO		n/a	H	H	H	H	H	H	H	H	n/a
	Small Creek PLP		Small Cr S/R (including EF Small Cr)	M	M	M	M	M	M	M	M	H	H	M
			Small Creek FMO		H	H	H	H	H	H	H	H	H	H
	South Fork Tacoma Creek PLP		SF Tacoma Cr S/R	M	M	M	M	M	M	M	M	H	H	M
			SF Tacoma Cr FMO		n/a	H	H	H	H	H	H	H	H	n/a
	Sullivan Creek PLP		Sullivan Cr S/R	L	n/a	M	H	M	M	H	M	H	H	n/a
			Sullivan Cr FMO		M	H	H	H	H	H	H	H	H	H
	Tacoma Creek PLP		Tacoma Cr S/R	L	H	M	H	H	H	M	H	H	H	H
			Tacoma Cr FMO		M	H	H	H	H	H	H	H	H	H
	****Pend Oreille (all FMO)			L	n/a	H	H	H	H	H	H	H	H	n/a

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Priest Lake	Granite Creek		Granite Cr S/R	M	n/a	M	M	M	M	M	M	M		n/a
		Priest Lake (all FMO)		L	n/a	M	H	M	M	H	H	H		n/a
Klickitat	WF Klickitat		WF Klickitat S/R		n/a									n/a
		Klickitat (all FMO)	Klickitat FMO	M	M	H	H	H	H	H	H	M	H	H
Walla Walla	Mill Creek		Mill Cr S/R	H	M	H	H	H	H	H	H	M	H	H
			Mill Cr FMO		H	H	H	H	H	H	H	M	H	H
			Yellowhawk Cr		n/a*									n/a
	NF Touchet River		NF Touchet S/R	H	H	M	M	M	H	M	M	M	M	M
			NF Touchet FMO		M	H	H	H	H	H	H	M	H	H
	SF Touchet River		SF Touchet S/R	H	M	H	M	H	M	M	H	M	M	M
			SF Touchet FMO		H	H	H	H	H	H	H	M	H	H
	Wolf Fork Touchet		Wolf Fork Touchet S/R	H	n/a	H	M	M	M	M	M	M	M	n/a

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Walla Walla (continued)			Wolf Fork Touchet FMO		M	H	H	H	H	H	H	M	H	H
			Walla Walla mainstem FMO		n/a	H	H	H	H	H	H	M	H	H
		****Walla Walla (all FMO)	n/a	M	n/a	H	H	H	H	H	H	M	H	n/a
Asotin	Wormell Gulch PLP		Wormell Gultch S/R	M	n/a	H	H	H	H	H	H	M		n/a
			George Cr S/R		n/a									n/a
			Charley Cr S/R	L	n/a									n/a
	NF Asotin													M (unknown so used Mod as default)
			NF Asotin S/R	L	L									
		Asotin FMO	Asotin FMO	L	n/a									n/a
Tucannon R	Cummings Creek													M (unknown so used Mod as default)
			Cummings Cr S/R	L	L									
	Hixon Creek PLP		Hixon Cr S/R	L	n/a									n/a
	Little Tucannon PLP			L	n/a									n/a

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**									
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	CHU Habitat Rating	
Tucannon R (continued)	Panjab Creek			L	n/a									n/a	
	Meadow Creek			L	n/a									n/a	
	Tucannon River		Tucannon R S/R	M	n/a									n/a	
		Tucanno n FMO	Tucannon R FMO	L	n/a									n/a	
Puyallup R	Upper White River		White R S/R (also includes Crystal, Huckleberry, Kickitat, Frying Pan Creeks - all upstream in the park)	L	n/a									n/a	
			White R. FMO		M	M	L	M	M		H	n/a	M	M	
	WF White River		WF White R S/R (all upstream in the park)	L	n/a									n/a	
	Carbon River		Carbon R mainstem S/R (Ipsut and Ranger Creeks are upstream in park)	H	n/a	L	L	L	L	L	L	H	L	n/a	
			Carbon R. FMO		H	M	L	M	M		H	n/a	M	M	

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Puyallup R (continued)	Upper Puyallup and Mowich Rivers		Upper Puyallup S/R (all excluded)	H	n/a	L	M	H	M	H	H	M	H	H
			Mowich R S/R (all upstream in park)	H	n/a	L	M	H	M	H	H	M	H	H
		Puyallup FMO	Puyallup FMO	H	H	M	M	H	H	M	H	n/a	M	H
Stillaguami sh	NF Stillaguami sh River		NF Stillaguamish S/R	M	H	M	L	M	M	L	M	M	M	M
			NF Stillaguamish FMO		H	M	L	M	L	L	M	n/a	M	M
	Upper Deer Creek		Upper Deer Cr S/R	M	n/a	H	L	H	H		M	M	H	n/a
			Deer Cr FMO		M	M	L	M	M			n/a	M	M
	Canyon Creek		Canyon Cr S/R	L	n/a									n/a
			Canyon Cr FMO		M	M	L	M	M			n/a	M	M
	SF Stillaguami sh		SF Stillaguamish S/R		n/a									n/a
			SF Stillaguamish FMO		M	M	L	M	L	L	M	n/a	M	M

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**														
Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	CHU Habitat Rating
Stillaguamish (continued)		Stillaguamish FMO	Stillaguamish FMO	H	H	M	L	M	L	L	M	n/a	M	M
Nooksack	Lower NF Nooksack R.		Kendell Cr FMO		M	H	M	M	M	H	M	n/a	M	M
			Maple Cr S/R		M	M	L	M	M	H	H	L	M	M
	Middle NF Nooksack R.		n/a		n/a	H	L	M	H	H	M	L		n/a
	Lower Canyon Creek		n/a		n/a									n/a
	Upper NF Nooksack R.		n/a		n/a									n/a
	Glacier Creek		n/a		n/a	L	M	L	M	L	L	L		n/a
	Lower MF Nooksack R.		MF Nooksack R. S/R		H	M	L	M	M	M	M	M	M	M
	Upper MF Nooksack R.		Upper MF Nooksack R. S/R		M	M	L	M	M	M	M	M	M	M
	Lower SF Nooksack R.		SF Nooksack S/R		H	H	L	H	H	H	H	M	H	H
			SF Nooksack FMO		H	H	M	M	M	H	M	n/a	M	M

Table I. Bull Trout CHU Matrix Analysis for estimating a baseline condition for designated critical habitat (derived from the bull trout matrix analysis table used for estimating local population and FMO baseline habitat risk). (H; M; L= functioning at unacceptable risk; functioning at risk; and functioning appropriately) (continued)

Core Area	Local Pop'n/ Potential Local Pop'n	FMO	CHU Name/ Function	BT Local Pop. and FMO Exposure Rating	CHU S/R and FMO Exposure Rating	Bull Trout Habitat Matrix Crosswalk to PCEs for Critical Habitat**								CHU Habitat Rating
						PCE 1,4,5,6,8 : Water Quality	PCE 1,4,6,8: Habitat Access	PCE 2,3,5,8: Habitat Elements	PCE 2,4,6,8: Channel Condition	PCE 2,4,5,8: Flow/ Hydrology	PCE 1,2,3,4,6,8: Watershed Conditions	Non-native fish: i.e Brook Trout Presence	PCE 2,3,6,7 : Prey Base	
Nooksack (continued)	Upper SF Nooksack R		n/a											
		Nooksack FMO	Nooksack FMO		H	H	M	M	M	H	M	n/a	M	M
Snoqualmie /Skykomish	SF Skykomish		SF Skykomish S/R	M	M	M	L	H	M	M	H	M	M	M
			NF Skykomish		n/a									n/a
			Snohomish/Skykomish FMO	M	M	M	L	M	M	L	H	n/a	M	M
Lower Skagit	19/1PLP		All S/R habitat		n/a									n/a
		Lower Skagit FMO	Lower River Skagit FMO	M	M	M	L	M	H	M	H	n/a	M	M
* Strikeout lines = no designated Critical Habitat within these local populations; n/a = local population has CH designated but only one of S/R or FMO critical habitat is designated; n/a = no FPHCP lands interspersed or upslope of designated critical habitat ** Used bull trout habitat conditions to characterize PCEs with additional category of forage base and then recalculated the overall condition rating (see appendix D). *** Criteria for used For Forage base H Bull trout habitat is ranked at a high risk for bull trout; OR connectivity is lacking or is not available for migration to a larger river, lake, or estuary to allow forage; OR there are no anadromous fish. M Bull trout habitat is ranked at moderate risk for bull trout; OR partial connectivity is available for migration to a larger river, lake, or estuary where adequate forage base exists; OR there are few anadromous fish or runs; OR forage base is unknown L Bull trout habitat is ranked at a low risk for bull trout; OR partial or full connectivity is available for migration to a larger river, lake, or estuary where adequate forage base exists; OR there are strong populations of anadromous fish . **** Used Core area FMO condition ranking to rank individual FMO for the CH FMO segments located within the stream of the local populations														

C.1.7 Item 7: First cut at estimating exposure of critical habitat adjacent to or interspersed with FPHCP lands.

Table J is the output of an analysis where we looked at areas of critical habitat and FP lands that are immediately upslope or interspersed and it generates the estimate of exposure. We did not look at lands outside farther upslope than the immediate area of the critical habitat. We looked at what the percentage of the spawning and rearing or FMO habitats were mapped as critical habitat from a coarse scale map (1:100,000) and sometimes using more precise scales to help in difficult areas. We also looked at the percent of FPHCP lands that were upslope or interspersed in these segments of mapped critical habitat. We then ranked the overall exposure based on criteria. For spawning and rearing segments of critical habitat we used minor, moderate, and significant (<10%, 10%, and >10% respectively) for estimating the amount of spawning and rearing segments in comparison to overall spawning and rearing habitat as well as for the estimating the amount of FPHCP lands that were upslope or interspersed with critical habitat segments. For FMO segments of critical habitat we used (<20%, 20%, and >20%) for estimating the amount of FMO segments in comparison to the overall amount of FMO habitat and then (<20, 20-40%, >40%) for the estimating the amount of FPHCP lands that were upslope or interspersed with critical habitat segments. The FMO is generally considered more resilient than spawning and rearing habitat and was given the higher percentage to reflect that.

Table J. Exposure risk ranking for CHUs.

Core Area	Local Population/Potential Local Population	FMO	CH name/use	Visual estimate of the % of all Spawning/ Rearing and FMO	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Exposure ranking*
Yakima	Ahtanum Creek (includes N and S Forks)		Ahtanum S/R	60	95	H
			Ahtanum FMO	95	60	H
	Box Canyon		Box Canyon S/R	50	0	n/a**
	Bumping River		n/a			
			Bumping FMO	20 of total; 20 below dam	<10	L
	Cle Elum River (includes Cooper and Waptus population)		Cle Elum S/R	<10	<10	L
			Cle Elum FMO	40 of total but <10 above dam; 80 below dam	95	H
	Gold Creek		Gold S/R	<10	90	M
	Kachess River		Kachess S/R	10	0	n/a
			Kachess FMO	10 of total but <10 above dam; 100 below dam	90	H
	Teanaway River (includes tribs & NF Teanaway)					
			Teanaway S/R	95	90	H

Table J. Exposure risk ranking for CHUs. (continued)

Core Area	Local Population/Potential Local Population	FMO	CH name/use	Visual estimate of the % of all Spawning/Rearing and FMO	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Exposure ranking*
Yakima (continued)			Teaaway FMO			H
	NF Tieton		NF Tieton S/R	<10	<10	L
	Rattlesnake Creek		Rattlesnake S/R	<1	95	M
	Upper Yakima River		upper mainstem Yakima S/R	10	95	H
		Yakima FMO	upper mainstem Yakima FMO	95	80	H
			Naches FMO	75	90	H
			Tieton FMO	60	90	H
Pend Orielle			Calispell Cr FMO	100	50%	H
	Cedar Creek PLP		Cedar Creek S/R	16%	14%	M
	Indian Creek PLP		Indian Creek S/R	80%	60%	H
			Le Clerc Cr S/R (including E. Branch and W. Branch LeClerc Cr, Fourth of July Cr)	20%	80%	H
	Le Clerc Creek		Le Clerc Cr FMO	n/a		n/a
	Mill Creek PLP		Mill Cr S/R	5%	10%	L
	Ruby PLP		Ruby Cr S/R	<10%	0	n/a
	Slate PLP		Slate Cr S/R	5%	0	n/a
	Small Creek PLP		Small S/R (including EF Small Cr S/R)	70%	50%	H
	SF Tacoma Creek PLP		SF Tacoma Cr S/R	13%	95%	H
			SF Tacoma Cr FMO	~50%	50%	H
	Sullivan Creek PLP		Sullivan Cr S/R	n/a		n/a
			Sullivan Cr FMO	10%	95%	M
	Tacoma Creek PLP		Tacoma Cr S/R	15%	95%	M
			Tacoma Cr FMO	~50%	80%	H
Walla Walla		Pend Orielle FMO	-	n/a	-	n/a
	Mill Creek		Mill Cr S/R (the NF portion in WA)	13% (1/2 in WA)	50%	M
			Mill Cr FMO	100%	90%	H

Table J. Exposure risk ranking for CHUs. (continued)

Core Area	Local Population/Potential Local Population	FMO	CH name/use	Visual estimate of the % of all Spawning/Rearing and FMO	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Exposure ranking*
Walla Wall (continued)			Yellowhawk Cr FMO	100%	0%	n/a
	NF Touchet		NF Touchet S/R (Spangler and Lewis are excluded)	50%	50%	H
	SF Touchet		NF Touchet FMO	100%	<1%	M
			SF Touchet S/R	13%	90%	H
			SF Touchet FMO	90%	30%	H
	Wolf Fork Touchet		Wolf Fork Touchet S/R	n/a		n/a
			Wolf Fork Touchet FMO	30%	15%	M
	Walla Walla (in OR)		Walla Walla FMO (in WA)	100%	0	n/a
		Walla Walla (all FMO)				

*Exposure criteria

Criteria for S/R:

L=If minor amount of S/R and minor (<10%) amount of interspersed or upslope FPHCP lands

M=If minor amount of S/R and moderate to significant (>10%) amount of interspersed or upslope FPHCP lands

M=If moderate amount of S/R and minor (<10%) or moderate (>10%) amount of interspersed or upslope FPHCP lands

M=If significant amount of S/R and minor (<10%) amount of interspersed or upslope FPHCP lands

H=If significant amount of S/R and moderate (>10%) amount of interspersed or upslope FPHCP lands

H=If moderate or significant amount of S/R and significant (>10%) amount of interspersed or upslope FPHCP lands

Criteria for FMO:

L=If minor amount of FMO and minor (<20%) amount of interspersed or upslope FPHCP lands

M=If minor amount of FMO and moderate (20-40%) or significant (>40%) amount of interspersed or upslope FPHCP lands

M=If moderate amount of FMO and minor (<20%) or moderate (20-40%) amount of interspersed or upslope FPHCP lands

M=If significant amount of FMO and minor (<20%) amount of interspersed or upslope FPHCP lands

H=If significant amount of FMO and moderate (20-40%) amount of interspersed or upslope FPHCP lands

H=If moderate or significant amount of FMO and significant (40%) amount of interspersed or upslope FPHCP lands

**No FPHCP lands interspersed or upslope of these segments of CH

C.1.8 Item 8: Second cut at estimating exposure of critical habitat adjacent to or interspersed with FPHCP lands for the overall moderate-high and high risk segments identified in Table J.

Table K is the output of an analysis where we re-evaluated areas of critical habitat that were identified as a moderate-high or a high or where habitat had ranked out as a high risk in the bull trout geographic risk analysis. The re-evaluation looked site specifically at each area of critical habitat and redefined the exposure rankings and consequently led to some changes in the overall risk scores in Tables B, D, F, and

G. and FP lands that are immediately upslope or interspersed and it generates the estimate of exposure. We did not look at lands outside the immediate vicinity of the critical habitat. We looked at what the percentage of the spawning and rearing or FMO habitats were mapped as critical habitat from a coarse scale map (1:100,000) and sometimes using more precise scales to help in difficult areas. We also looked at the percent of FPHCP lands that were upslope or interspersed in these segments of mapped critical habitat. We then ranked the overall exposure based on criteria. For spawning and rearing segments of critical habitat we used minor, moderate, and significant (<10%, 10%, and >10% respectively) for estimating the amount of spawning and rearing segments in comparison to overall spawning and rearing habitat as well as for the estimating the amount of FPHCP lands that were upslope or interspersed with critical habitat segments. For FMO segments of critical habitat we used (<20%, 20%, and >20%)) for estimating the amount of FMO segments in comparison to the overall amount of FMO habitat and then (<20, 20-40%, >40%) for the estimating the amount of FPHCP lands that were upslope or interspersed with critical habitat segments. The FMO is generally considered more resilient than spawning and rearing habitat and was given the higher percentage to reflect that.

Table K. Reevaluation of those CH segments that were High or Mod High in the overall ranking, and other segments that were determined to need further evaluation (3-29-06 JD).

Core Area	Local Population/Potential Local Population	FMO	CH name/use	First cut at visual estimate of the % of all Spawning/Rearing and FMO	More precise visual estimate of the % of actual CH within redlines****	Second cut at a visual estimate of actual spawning/rearing and FMO of mod-high to high risk CH	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Validation Exposure ranking**
Yakima	Ahtanum Creek (includes N. and S. Forks)		Ahtanum S/R (includes N. and S. Forks)	40	20	30	80	H
		Yakima FMO	Ahtanum FMO	100	80	90	90	H
	Teanaway River (includes tribs & NF Teanaway)		Teanaway S/R (includes mainstem, Jungle, and Jack)	40	40	15	35	H
		Yakima FMO	Teanaway FMO	95	50	50	90	H
	Rattlesnake Creek		Rattlesnake S/R	2	50	1	85	M
	Upper Yakima River		upper mainstem Yakima S/R	10	100	10	75	H
		Yakima FMO	upper mainstem Yakima FMO	95	80	75	90	H
	Cle Elum River (includes Cooper and Waptus population)	Yakima FMO	Cle Elum FMO	40 of total but <10 above dam; 80 below dam	20 of total but 80 below dam	20 of total but 80 below dam	95	H
	Kachess River	Yakima FMO	Kachess FMO	10 of total but <10 above dam; 100 below dam		10 of total but 100 below dam	90	H
		Yakima FMO	Naches FMO	75	100	75	90	H
		Yakima FMO	Tieton FMO	60	100	60	90	H
NE Washington	Indian Creek PLP		Indian Creek S/R	50	15	7.5	60	M
	Le Clerc Creek		Le Clerc Creek S/R (including E. Branch and W. Branch LeClerc Cr, Fourth of July Cr)	40	10	4	80	M

Table K. Reevaluation of those CH segments that were High or Mod High in the overall ranking, and other segments that were determined to need further evaluation (3-29-06 JD). (continued)

Core Area	Local Population/Potential Local Population	FMO	CH name/use	First cut at visual estimate of the % of all Spawning/Rearing and FMO	More precise visual estimate of the % of actual CH within redlines****	Second cut at a visual estimate of actual spawning/rearing and FMO of mod-high to high risk CH	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Validation Exposure ranking**
NE Washington (continued)			Le Clerc Creek FMO	11	100	11	50	M
	Ruby PLP		Ruby Cr S/R	10	<1	<0.1	95	M
	Slate PLP		Slate Cr S/R	5	60	3	50	M
			Small S/R- including EF					
	Small Creek PLP		Small Cr S/R	20	15	3	95	M
			Small Creek FMO	100	100	100	20	H
	SF Tacoma Creek PLP		SF Tacoma Creek S/R-	13	7	1	95	M
			Sullivan Creek FMO	10	100	10	95	M
	Tacoma Creek PLP		Tacoma Creek S/R	25	60	15	95	H
			Tacoma Creek FMO	100	100	100	10	M
			Calispell Cr FMO	100	100	100	30	H
Walla Walla			Mill Creek S/R (the NF portion in WA);	10	3	0.3	95	M
	Mill Creek		Mill Creek FMO	100	50	50	90	H
			NF Touchet-S/R (Spangler and Lewis are excluded)	50	85	40	50	H
	North Fork Touchet		NF Touchet FMO	100	100	100	<1%	M
	SF Touchet		SF Touchet S/R	13	7	1	90	M
			SF Touchet FMO	75	80	60	40	H
			Wolf Fork Touchet					
	Wolf Fork Touchet		FMO	30	20	6	20	M
Klickitat		Klickitat FMO	Klickitat R FMO	60	30	18	80	M

Table K. Reevaluation of those CH segments that were High or Mod High in the overall ranking, and other segments that were determined to need further evaluation (3-29-06 JD). (continued)

Core Area	Local Population/Potential Local Population	FMO	CH name/use	First cut at visual estimate of the % of all Spawning/Rearing and FMO	More precise visual estimate of the % of actual CH within redlines****	Second cut at a visual estimate of actual spawning/rearing and FMO of mod-high to high risk CH	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Validation Exposure ranking**
Puyallup	Carbon R		White R. FMO	50	10	5	90	M
			Carbon R mainstem S/R (Ipsut and Ranger Creeks are excluded)	25	30	7.5	0	n/a
			Carbon R. FMO	80	40	32	75	H
	Upper Puyallup and Mowich Rivers		Upper Puyallup S/R (all excluded)	0	100	0	n/a	n/a
			Mowich R (all upstream in park)	100	100	100	0	n/a**
			Puyallup FMO	100	40	40	70	H
Stillaguamish	NF Stillaguamish River		NF Stillaguamish S/R	60	50	30	95	H
			NF Stillaguamish FMO	100	40	40	90	H
	Upper Deer Creek		Deer Creek S/R (All should be excluded)	20	0	0		n/a*
			Deer Creek FMO	50	20	10	95	M
	Canyon Creek		Canyon Creek S/R (all should be excluded)	30	0	0		n/a
			Canyon Creek FMO	100	5	5	90	M
			SF Stillaguamish S/R(all is excluded)	n/a				n/a
			SF Stillaguamish FMO (includes Jim Creek)	10	7	1	60	M
		Stillaguamish FMO	Stillaguamish FMO	100	70	70	60	H

Table K. Reevaluation of those CH segments that were High or Mod High in the overall ranking, and other segments that were determined to need further evaluation (3-29-06 JD). (continued)

Core Area	Local Population/Potential Local Population	FMO	CH name/use	First cut at visual estimate of the % of all Spawning/Rearing and FMO	More precise visual estimate of the % of actual CH within redlines****	Second cut at a visual estimate of actual spawning/rearing and FMO of mod-high to high risk CH	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Validation Exposure ranking**
Nooksack	Lower NF Nooksack R.		Kendell Cr FMO	60	100	60	30	M
			Maple Cr S/R	20	85	17	95	M
	Middle NF Nooksack R.		n/a*					
	L. Canyon Creek		n/a					
	Upper NF Nooksack R.		n/a					
	Glacier Creek		n/a					
	Lower MF Nooksack R.		Lower MF Nooksack R. S/R (includes Canyon Cr)	25	45	11	95	H
	Upper MF Nooksack R.		Upper MF Nooksack R. S/R	<1	100	<1	50	M
	Lower SF Nooksack R.		SF Nooksack R. S/R	50	50	25	75	H
			SF Nooksack FMO	100	25	25	75	H
	Upper SF Nooksack R.		n/a					
	Nooksack FMO	Nooksack FMO	60	100	60	50	H	
Snoqualmie/Sky komish	SF Skykomish		SF Skykomish S/R	2	25	2	20	M
			Snohomish/Skykomish FMO	20	70	14	20	M
Lower Skagit	19/1PLP		All S/R habitat	n/a				
		Lower Skagit FMO		70	10	7	20	M
Asotin	Wormell Gulch PLP		Wormell Gulch S/R	n/a				n/a
			George Creek S/R	n/a				n/a
	Charley Creek		Charley Creek S/R	5	1	5	0	n/a
	NF Asotin		NF Asotin S/R	1	5	<5	<1	L

Table K. Reevaluation of those CH segments that were High or Mod High in the overall ranking, and other segments that were determined to need further evaluation (3-29-06 JD). (continued)

Core Area	Local Population/Potential Local Population	FMO	CH name/use	First cut at visual estimate of the % of all Spawning/Rearing and FMO	More precise visual estimate of the % of actual CH within redlines****	Second cut at a visual estimate of actual spawning/rearing and FMO of mod-high to high risk CH	Visual estimate of the % of FPHCP lands Interspersed or upslope of CH	Validation Exposure ranking**
Asotin (continued)		Asotin FMO	Asotin FMO	100	100	100	0	n/a
	Cummings Creek		Cummings Creek S/R	60	5	3	6	L
	Hixon Creek PLP		Hixon Creek S/R	5	<1	<5	0	n/a
	Little Tucannon PLP			n/a				n/a
Tucannon	Panjab Creek			n/a				n/a
	Meadow Creek			n/a				n/a
	Tucannon River		Tucannon River S/R	3	<1	<3	0	n/a
		Tucannon FMO	Tucannon FMO	80	70	56	0	n/a

* No Critical Habitat in these local populations, all excluded.

** No FPHCP lands interspersed or upslope of these segments of CH

***Criteria used for ranking S/R and FMO exposures

Criteria for S/R

L=If minor amount of S/R (<10%) and minor (<10%) amount of interspersed or upslope FPHCP lands

M=If minor amount of S/R (<10%) and moderate to significant (>10%) amount of interspersed or upslope FPHCP lands

M=If moderate amount of S/R (10%) and minor (<10%) or moderate (>10%) amount of interspersed or upslope FPHCP lands

M=If significant amount of S/R (>10%) and minor (<10%) amount of interspersed or upslope FPHCP lands

H=If significant amount of S/R (>10%) and moderate (>10%) amount of interspersed or upslope FPHCP lands

H=If moderate or significant amount of S/R (≥10%) and significant (>10%) amount of interspersed or upslope FPHCP lands

Criteria for FMO

L=If minor amount of FMO (<20%) and minor (<20%) amount of interspersed or upslope FPHCP lands

M=If minor amount of FMO (<20%) and moderate (20-40%) or significant (>40%) amount of interspersed or upslope FPHCP lands

M=If moderate amount of FMO (20-40%) and minor (<20%) or moderate (20-40%) amount of interspersed or upslope FPHCP lands

M=If significant amount of FMO (>40%) and minor (<20%) amount of interspersed or upslope FPHCP lands

H=If significant amount of FMO (>40%) and moderate (20-40%) amount of interspersed or upslope FPHCP lands

H=If moderate or significant amount of FMO (20-40% or >40%) and significant (40%) amount of interspersed or upslope FPHCP lands

****% of actual CH within the redlines is based on a review of looking and zooming in on a GIS arcmaps to see where fphcp lands were in relation to forested and non forested lands. Where the redlines were in non forest lands it was determined to be actual CH. Non forested lands were determined by looking at quads maps of 1:24,000 scale and a map of National Land Cover Data set classification system of 1:100,000 scale.