

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
				1	1-07 The executive summary of the report is exceptional. I greatly appreciate when reports contain such a summary, and in this case, it is written such that it is accessible to a broad readership that includes scientists, resource managers, and non-experts in fisheries and restoration.	n/a
				5	5-01 While the Executive Summary is well written, it is too detailed and too long to really be an ES. I would suggest shortening this quite a bit. For example, the restoration actions aren't really a summary, but a pretty long list of all actions.	Shortened Executive Summary to 4 pages, including summary table as recommended
6-7				5	5-02 "Category 5 on Washington State's Clean Water Act (CWA) 2008 303(d) list of impaired waterbodies. Category 5..." Somewhere in here it would be good to mention explicitly what the pollutant is to make the transition to the next sentence smoother.	Revised text so it was clear
17				5	5-03 change Agency to Agency's, delete EPA's	the "'s" was added and EPA's was deleted
34				5	5-04 WRIA 1 - Not yet defined	wrote "Water Resource Inventory Area 1 (WRIA 1)"
43				5	5-05 "involvement" - Maybe engagement, rather than involvement again?	wrote "engagement" in place of involvement
4				5	5-06 "The Beechie method" - Is this really what they call their methodology?	Yes. The methodology was developed by Beechie et al in <i>Beechie, T., H. Imaki, J. Greene, A. Wade, H. Wu, G. Pess, P. Roni, J. Kimball, J. Stanford, P. Kiffney, and N. Mantua. 2012. Restoring salmon habitat for a changing climate. River Research and Applications. doi:10.1002/rra.2590</i> . Tim Beechie is also a member of the core team involved in developing this report.
20-21				5	5-07 This is confusing. Not sure what is meant here.	Deleted sentence.
32-33				5	5-08 "forest practices roads" - Not sure what this means. Are these roads for forest management access?	Changed to forest roads and defined term in footnote: "Note that forest roads refer to all private and state roads that are located on state or Federally administered forest lands. These roads are subject to: list all. the Forest Practices Act and Rules. Refer to Forest Practices Illustrated, 2009, Wa http://file.dnr.wa.gov/publications/fp_fpi_c_complete.pdf
42				5	5-09 "Forest practices" - Like what? Is this just logging or thinning?	changed sentence to "Forestry dominates the watershed and timber harvest and logging road construction are likely the largest contributors to the legacy impacts."
40				5	5-10 "Forest Practices rules" - Is there a citation for this?	Reference deleted in Executive Summary; citation added in next appearance of term.
29				5	5-11 "FFR" - define	added "Forest and Fish Report (FFR) [note: moved to vi line 2]
31-32				5	5-12 very unusual to call out a specific person and her research without it being peer-reviewed. I would suggest rewording or finding a citation	Deleted reference

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
19				5 5-13	"climate change scenarios and model downscaling " - Or perform sensitivity analyses to determine effect on plans and actions. Don't really need downscaling to test that.	Revised to Monitoring, Research and Adaptive Management recommendations for clarity and to remove downscaling reference.
				1 1-01	The report provides a clear, comprehensive summary of the potential effects of climate change on recovery actions for fish species in the South Fork Nooksack River. The overall approach is robust and technically sound, and all aspects have been well vetted through various meetings and consultations with scientists and resource managers. The recommendations that are provided for species recovery are exceptionally helpful and are consistent with other efforts in the Pacific Northwest and beyond relative to climate change effects and climate change adaptation. This project should be used as a model for all future climate change-TMDL assessments for fish.	n/a
				1 1-02	Objectives of the TMDL provisions are effectively integrated to fully support recovery, including effective merging of existing science and new analyses. I have rarely seen this process addressed so completely. This is exactly how an assessment should be done.	n/a
				1 1-03	I am familiar with Beechie et al. (2012), which is an excellent stream restoration template in the context of climate change. Variable streamflows and high stream temperatures were effectively analyzed, and restoration actions were appropriately associated with how those factors are expected to change in a warmer climate. Beechie et al. (2012) provides concepts, and this assessment puts them into action in a way that can be implemented by resource managers.	n/a
				1 1-04	As suggested above, this is the first and best effort of which I am aware that moves theory and concepts into a sound, realistic framework for recovery. This approach now needs to move beyond the pilot study phase into implementation on the South Fork Nooksack River and other streams.	n/a
				1 1-05	Results and methods are effectively incorporated into the temperature TMDL. Cause-effect relationships are clear, and the approach for addressing the TMDL is well justified.	n/a
				1 1-06	The scientific literature in the report appears to be comprehensive, drawn from a variety of sources and perspectives. I am unaware of any major omissions.	n/a
				2 2-01	This is an impressively comprehensive and thorough assessment of the effects of climate change on fish species and recovery actions in the South Fork Nooksack. The breakdown by climate risk, salmonid species, and recovery actions is a useful approach that presents the information in different ways that are likely to be useful to different people (e.g. fish biologists vs. a planners or policy makers). Beechie et al. 2012 is an appropriate methodology for the analysis and applied at an appropriate scale, although it clearly takes substantial work to apply the analysis to an entire recovery plan rather than one or a few restoration actions. This will likely be difficult to replicate for other recovery plans given the depth of the analysis, but can still serve as a model process.	n/a
				3 3-1	I have a very few minor editorial comments which are included below. Overall, I think that the paper is very well written and very timely given the kind of climate impacts we are already seeing happening all around us.	n/a
				4 4-1	This is a very impressive plan. Klein et al have done an excellent job summarizing work done previously, both on biology and recovery planning, and generated a very useful document adding climate change to existing recovery plans. They have slightly re-prioritized recovery effort to make populations somewhat more resilient to climate change, within practical limits. They clearly lay out issues that require public education and agreement, as well as those that can be done more reliably. I especially liked the life-stage and reach-specific analysis of climate and restoration issues. There was very thorough and careful consideration of the full diversity of impacts, which is quite rare. Well done!	n/a
				4 4-2	I am not an expert on the ground in these habitats, so I cannot evaluate how "correct" their assessment is in terms of restoration needs and actions. Their recommendations seem to be very well thought out, so I trust they have done as good a job as possible. They have synthesized a huge amount of information in a very practical and readable, user-friendly presentation.	n/a
				4 4-4	The only link I had some trouble finding was the exact path from the discussion of each topic to the specific priority ranking. They do a wonderful job laying out the climate change risk and how each recovery action would or would not address that concern. This is probably plenty to ask for. However, a big deal is made about this translating specifically into prioritization of recovery actions. Recovery actions operate on something like 10-year, 3-year, and funding year time scales. All 3 of these time scales are relevant	Revised Section 5.3 to better tie the analysis in previous sections to the project recommendations. Added a table showing restoration actions, expected timescales,
				1 1-8	The Introduction provides a well-rounded background for the assessment, moving from general to specific issues. This is a complex assessment that contains many pieces, but the writing is sufficiently clear to give readers a good framework for what is to follow.	n/a

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
16			5	5-14	change Agency to Agency's, delete EPA's	changed to Agency's and took out EPA's
27			5	5-15	change pilot to Pilot	changed to Pilot
32			5	5-16	"QUAL2Kw" - Not yet defined	Defined as: the Washington version of a river and stream water quality model (QUAL2K) that is in turn a modernized version of EPA's older QUAL2E model
			1	1-9	This section provides a useful structural and historical description of the recovery plan process, allowing readers to understand both the content and evolution of the process. The intricacies are in some cases quite important, and I learned a lot from reading this section.	n/a
24-25			5	5-17	delete Water Resource Inventory Area and brackets, use WRIA	deleted "Water Resource Inventory Area" and brackets around "WRIA"
			1	1-10	The report describes the engagement process as "stakeholder centric." That is a bold statement, but I think it is accurate based on the documentation presented here. I have attended three presentations for this study and found them to be clear, consistent, and thorough in how information was presented, with emphasis on obtaining feedback from diverse groups and perspectives. It is helpful to have this documentation here, because it demonstrates the evolution of the project over time.	n/a
2			5	5-18	delete involvement	"involvement" deleted
6-8			5	5-19	"Tim Beechie, and Steve Klein. The Nooksack Indian Tribe is a key implementer of recovery actions, and staff—specifically, Oliver Grah, Treva Coe, Mike Maudlin, and Ned Currence" - Might be good to identify their affiliation either in text or as footnotes.	Added footnote that includes title and affiliation of each.
14			5	5-20	"The CIDT meets via conference call on a regular basis" - Still ongoing? Is there an end date? Maybe provide a date here for context since it probably won't exist indefinitely.	Added: beginning in February 2013 through report completion in 2016
			1	1-11	The methods are robust, logical, and well explained, building on a solid base of previous science and empirical data. Different factors are considered sequentially for various stream reaches, demonstrating a range of issues that need to be addressed at various locations. This is definitely not a one-size-fits-all approach. The decision tree, based on Beechie et al. (2012) provides a good framework. A broad range of users can understand this section.	n/a
7			5	5-21	Change "Beechie has" to "Beechie et al. (2012) have"	added "et al. (2012)"
2	4-1		5	5-22	<ul style="list-style-type: none"> Is it habitats or environmental conditions that limit salmon recover? Q2: "climate change" not just climate; also add "change" to bottom question on right The word "likely" can be deleted from the box "Do planned actions likely ameliorate climate effect?"	"change" was added to the bottom right question and "likely" was removed from the question in the box so it now reads "Do planned actions ameliorate climate effect?"
4			5	5-23	change "climate risks" to "climate change risks"	added "change"
11			5	5-24	"forest practices rules " - Is there a citation for this? Or maybe add a footnote to define this?	Changed to forest roads and added supporting information in a footnote to further describe regulatory requirements
3			5	5-25	"Forest Practices" - This is not capitalized everywhere. Should be consistent throughout.	Changed to lower case throughout
9	4-3		5	5-26	"Land Use" - Federal lands is not a land use. Is this multi-use forest?	Updated Figure 4 3. Generalized Land Use in the South Fork Watershed and Subbasins
			1	1-12	The assessment is the best part of the report. Analytical output is generally displayed effectively, accompanied by appropriate explanations. Some people might prefer to use a modeling approach other than VIC, but I think it is fine, and is applied consistently across this analysis. The clarity of comparisons between historical future temperature over the course of a year is compelling, and makes it easy to see how things will change in the future.	n/a
			1	1-13	Sediment is a topic that is not adequately considered in some temperature TMDLs, and its inclusion here is quite useful for a comprehensive assessment of fish habitat. Figure 5-18 is very helpful for understanding spatial patterns.	n/a

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
				1	1-14 The species assessment is clear and connected effectively to all of the preceding information. The intensive detail and connections to salmon life history provide users with a high level of confidence in the analytical output and inferences. The list of possible actions is one of the best examples of applied climate science that I have seen.	n/a
				2	2-03 Section 5.2 Per Salmonid Species In general this section needs more clarity and distinction about what is known vs. the uncertainty in the biological response of species to the projected changes in the climate and hydrologic conditions. Much of the biological responses of individual species to climate changes are still unknown. The assumptions and hypotheses identified in this section are useful for a qualitative assessment, but it would be beneficial to provide more transparency as to what responses are “expert opinion”, “hypotheses”, or directly supported by studies of species response to climatic variability or other surrogates for climate change impacts. It is important to avoid having the biological responses become assumed “truths” simply because they are repeated frequently. Providing this distinction would also be useful for indicating where the important gaps are in this information to support further studies and monitoring. This critical uncertainty is mentioned in section 5.3.3, but could also be discussed where relevant throughout Section 5.2.	Revised/added last 2 sentences in first paragraph in 5.2.2. to indicate that we discuss hypothesized impacts and that monitoring needed to test hypotheses.
				2	2-04 Section 5.3 Restoration and Protection Actions This section is difficult to review because it is so specific to local conditions and restoration actions. One general concern I have for this section is that the recommended actions are very broad and the link to climate change impacts is not clear for many of them. This section reads more as recommendations for revising the recovery plan in general, rather than revisions to consider in light of climate change. It would be beneficial to highlight the actions that are new recommendations resulting directly from the analysis of climate change impacts or recommendations regarding changes in locations or priorities of existing restoration actions to minimize climate change impacts. How are these recommendations different because of the preceding analysis? Or are they the recommended actions regardless of climate change.	Substantially revised Section 5.3 to highlight new priorities based on the qualitative assessment and better tied the recommendations to the Qual2kw analysis.
46				2	2-05 Define “rain-on-snow zone”. Hydro-climate terminology also uses “mixed-rain-and-snow” basins or “transitional” basins. Not sure if this is referring to the same thing.	Added definition and bibliographic citation: The “rain-on-snow” zone is defined in the HCP as an elevation zone where it is common for snowpacks to be partially or completely melted during rainstorms several times during the winter (DNR 1997).

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
1-26			2	2-06	The relevance of this paragraph to the section isn't clear, particularly the results regarding runoff associated with the treatments.	We believe that the material presented in the cited paragraph is relevant. It discusses an important factor separate from climate that may affect the water temperature and flow volume of tributaries, both of which influence the water temperature during critical periods in the impaired segments of the mainstem and thus the potential response to climate change. Flows are addressed because the critical conditions are associated with summer low flow periods and any diminution of baseflow can further exacerbate extreme thermal events because there would be less water mass to buffer heat inputs. The material is included at the end of Section 5.1.1.1 because it provides one line of evidence to support the development of the additional model scenarios described immediately afterwards in Section 5.1.1.1.1.
	5-2		2	2-07	What's the slope and significance rather than the equation?	The figure was updated. The slope is shown in the equation (but was corrected to 0.0135 deg C/yr). The p value of the slope has been added to the figure. Station name in figure caption changed to "Clearbrook."
27			2	2-08	Here spring snowmelt is described as decreasing but described as increasing in the introduction. Hydro-climate projections indicate that spring runoff is projected to decrease. This paragraph could also mention projections for decreasing precipitation in the summer for this region. Although less certain than snowmelt decreases, this is consistently projected among climate models.	The paragraph already discusses the likelihood of decreasing summer flows but the statement regarding decreasing summer precipitation has been added. The introduction does not mention increased summer flows
	5-5		2	2-09	show PDO phase shifts on this figure as well.	The PDO phases have been added to the figure.
			2	2-10	I understand the need to flow in as depths in mm because the VIC output is not bias corrected and the absolute values of flow could be confusing relative to the stream gage observations, but the depth in mm is a hard metric to understand when all other analysis is based on cfs. Perhaps you could show the non-bias-corrected values of cfs to show the trends but indicate that there is bias.	As noted in the comment, we prefer not to show the VIC output in cfs due to the lack of bias correction. However, the conversion has been noted in the text (1 mm/d = 9.17 cfs).
			2	2-11	It would be helpful to many readers to provide the conversions of temperature from C to F here and throughout the document since this is a government publication.	A translation to F is included here and at a few other key points in the text to aid the reader. We believe it would be unwieldy to convert all references to temperature in C to F, especially as the criteria are specified in Celsius.
16			2	2-12	How many cells are used for this calculation?	25, now stated in the figure note.

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
30			2	2-13	Could be deleted for simplicity and it doesn't add new information.	Deleted paragraph here. Added paragraph to low flow regimes to summarize more recent DHSVM modeling (Murphy 2015) work.
31-37			2	2-14	CIG can provide some information at the HUC 10 scale and this could be relevant to spatial differences within the Nooksack watershed.	While CIG does provide some information at the HUC10 scale those results are not calibrated to the South Fork Nooksack watershed. We have chosen instead to focus on the results obtained from the 25 CIG/VIC model grid cells that intersect the watershed rather than relying on CIG's HUC10 summaries so as not to over-emphasize the reliability of those estimates.
7-9			2	2-15	It would be good to indicate how low elevation this part of the watershed is and does in fall in rain-dominated, snow-dominated, or mixed hydrologic regime. If it is a low-elevation, rain-dominated area, I would think the impacts of summer flows would not be as bad as a more mixed-rain-and-snow systems at slightly higher elevation.	The sentence in question was confusing as written and has been revised. We don't necessarily expect a proportionately greater loss of summer flow in these low elevation reaches. Instead, the intent of the sentence was to suggest that the reduction in flow will have a bigger impact on attaining temperature criteria at these low elevation locations.
5-18			2	2-16	What are the dots? How are the precipitation zones calculated? What zone is the area not shaded in blue?	Edited caption to read: " Dots show QUAL 2Kw model nodes of the Maximum Stream Temperatures (7Q10 flows) along the mainstem South Fork Nooksack for 2040 (using a medium GCM), along with current snow-dominated precipitation zones based on elevation, climate, latitude and vegetation (DNR 1991). Not shown are the lower elevation "rain-dominated" and "rain-on-snow" zones in the watershed." Added bib entry for DNR climate zones.
5-19			2	2-17	These are very useful figures for looking at impacts relative to life stages.	n/a
			2	2-18	Start tables on separate pages for ease of reading.	Formatted as noted.
			2	2-19	How is impact potential defined for the tables?	Added sentence in second paragraph of 5.3 (repeated as footnote in 5.3.1) to describe how restoration priority defined.
13			2	2-20	Should this be updated now that is 2016? Status, is it complete?	Changed to show the analysis was completed in 2015 and that the Forest is evaluating alternatives.

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
46, 1-3			2	2-21	Do not need to repeat this information as it is stated on the previous page. Can it be made more specific to erosion/sediment delivery actions vs. stream flow regime actions?	Deleted paragraph cut and pasted from previous section. Will expand on this when addressing other comments relating to section 5.3.
34-37			2	2-22	Does this statement need to be updated or is the qualitative assessment process continuing beyond this current document? Explain here.	Provided time period of engagement as ending with the publication of the document
38-40			2	2-23	I think this statement can be stronger. The process used in this pilot project can be used as a model to be applied to recovery planning anywhere, not just rivers with similar factors.	added" The process used in this pilot project can be used as a model to be applied to recovery planning anywhere, not just rivers with similar factors."
45			2	2-24	I would say "intensify" rather than "occur" as there is evidence that anthropogenic climate change has already influenced temperatures and snowpack.	changed to "intensify"
	5-1		3	3-2	The non-fish key graphic color is very hard to see on my computer.	New figure created with "non-fish" symbolized with a heavier line weight
13			3	3-3	Should references be included for the sub-lethal effects of temperature increase?	reference "(McMullough et al. 2001)" added
38-41			3	3-4	Should references be included for these statements?	reference "(McMullough et al. 2001)" added
35-36			4	4-3	There was just one comment, "if greater than a 24-day delay for these fish, survival to egg deposition should be very low" (pp51, in 35-36) that I did not see a citation for. What is it based on?	took out "if greater than a 24-day delay for these fish, survival to egg deposition should be very low" and replaced with "in Atlantic salmon, as little as a 1-week delay in spawning after full maturation markedly reduces egg quality (de Gaudemar and Beall 1998, as cited by McCullough et al. 2001)"
			4	4-5	But going from 5.1, 5.2 and 5.3 to 5.4 seems to have a missing step. Can you explain more clearly the management process that is at work?	Significantly strengthened and expanded discussion of management, roles and responsibilities
			4	4-6	Also, it seems relevant that there was a switch from spatial organization (by reach) to process organization (by restoration action type). Can you explain whether this achieves the same goal?	Added additional geographic specificity to the action types. Tied priorities to reaches and watersheds.
			4	4-7	How do the different recovery action types compare with each other in the priorities? What process do you use to decide this? I can imagine this exercise would be much more simply achieved with a quantitative sensitivity analysis, assuming you could find some way to quantify cost and opportunity, in terms of do-ability. This would have made the final product much more transparent.	Relative action priorities by type are shown in Tables 5.7 and 5.8. Added sentence to describe how action priorities determined. "Action priority integrates the potential to implement the action in the analysis unit, ability of the action to ameliorate climate impacts, and the time scale of benefit (Table 5-10)." In section 5.7, added language under each action type to reference qual2k modeling (if applicable).
11			5	5-32	Insert space between IPCC and date 2013	space inserted

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
2			5	5-33	"best five" - What does this mean?	Best performing in terms of biases relative to precipitation and temperature.
3			5	5-34	"worst five" - And this?	Worst performing.
14	5-11		5	5-35	But only one emissions scenario. Would be helpful to briefly mention that above as well when discussing the selection of climate models. Low and high impact scenarios generally refers to different emissions scenarios, rather than the span of temperature predictions.	The full rationale for selection of the three scenarios is contained in the Quantitative Assessment at some length (Butcher et al., 2015, as cited), but was not explained here. We have added a brief summary footnote. The text defines high and low impact in terms of projected local impacts on temperature and precipitation.
19			5	5-36	"Washington Department of Ecology" - Be consistent about abbreviations. All the sections above just reference 'Ecology'	changed to "Ecology" the "Washington Department of" was deleted
	5-13		5	5-37	Is the medium 7Q10 nat/rest output shown because it's the only one that is below the threshold? Or is it the first one, i.e., low GCM 7Q10 nat/rest is also below?	The medium GCM 7Q10 with nat/rest is shown as an example of what could be attained with full restoration. The medium impact GCM is used as representative of the central tendency of potential results. This run was from a supplemental analysis conducted in support of the draft TMDL and was only performed for the medium GCM.
9			5	5-38	"Table 5-4" - Are the percent changes similar using the lower and higher climate models? Why select just the middle one?	The medium impact scenario is presented to provide an indication of the central tendency of projections. Results from the high and low impact scenarios differ somewhat and are shown in Butcher et al., 2015, which is now cited.
5			5	5-39	Delete ',' after °C	deleted ","
		5-5	5	5-40	I like this summary table! You could use it in the ES instead of a lot of the text. This is a great way to present the climate change impacts throughout the watershed.	Added to Executive Summary
1			5	5-41	Change "Evaluate" to "Evaluation"	changed to "Evaluation"
20			5	5-42	"increases or reductions in growth" - Is this life stage dependent as well?	Added language to indicate referring to juvenile salmonids.
20			5	5-43	Change "and others" to "et al."	changed to "et al."
5			5	5-44	"there is concern" - I might characterize this more as an additional source of uncertainty...	changed "concern" to "uncertainty"
11			5	5-45	"follows" - In this section? In a table? Please specify.	added "in this section" after follows
15			5	5-46	"2-3 °C lower" - So 22 or 23 degrees? Am I interpreting that correctly?	changed "lower" to "cooler"
28			5	5-47	Change "He" to "They"	changed to "They"
29			5	5-48	Change concludes to conclude	changed to "conclude"
11			5	5-49	Delete '!' after degrees C	deleted "."
15			5	5-50	Delete '!' after degrees C	deleted ","
17			5	5-51	Delete space before "Eventually"	deleted space
25			5	5-52	Change "it" to "is"	changed to "is"
17			5	5-53	"Evaluate" - Evaluate what? Or use 'evaluation'	changed to "Evaluation"
26			5	5-54	"development" - Housing development? Or what kind of development?	made it "land development"

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
28			5	5-55	Change "Beechie et al., 2012 (Table 3)" to "Beechie et al. (2012, Table 3)	changed to "Beechie et al. (2012, Table 3)"
29-30			5	5-56	"in EPA Region 10 Climate Change and TMDL Pilot Proposed Methodology for Evaluating Climate Change on Endangered Species Act Recovery Actions, "Methodology Report", Final – December 2013" - Just provide the citation here (USEPA 2013)	added "(USEPA 2013)" and deleted "in EPA... through (Table 5)"
		5-7	5	5-57	change table title "the South Fork Methodology Report" to "this report"	changed to "this report"
		5-8	5	5-58	" Superscripts 2 and 3 selected" - Where are these superscripts in the table?	Added superscript 2 to table 5-8. Deleted the asterisk from sediment actions priority - there are no positive or context-dependent ameliorate calls, so priority is low (not a qualified low pending further analysis). Deleted superscript 3 and asterisk footnotes.
37			5	5-59	"Recommendations" - Who has authority to implement these recommendations? Or are different recommendations for different entities? Can this be specified? Otherwise, these all sounds like great ideas, but no one feels like it's their responsibility to take on. This comment can be applied to all the following sections with recommendations...	Revised Section 5.3 to include responsible partners for implementing the recommendation.
11			5	5-60	Insert space between 1.The	added the space
23			5	5-61	"Recommendations" - These recommendations do identify more of the responsible parties. That's nice. Please do that throughout this section with the other recommendations too!	Revised Section 5.3 to include responsible partners for implementing the recommendation.
16			5	5-62	Change "is" to "are"	changed to "are"
43			5	5-63	Delete double period ".."	deleted extra "."
19			5	5-64	"Planning Actions" - Again, geared towards whom?	Added language on responsible parties to this section.
10			5	5-65	"5.3.2.2 Monitoring, Research, and Adaptive Management" - Same comment. Is this for NGOs, academics, funding agencies, EPA?	Added language on responsible parties to this section.
32			5	5-66	delete "future"	deleted "future"
35			5	5-67	change "climate impacts" to "climate change impacts"	added "change"
38			5	5-68	change "response" to "responses"	changed to "responses"
39			5	5-69	delete such	deleted "such"
33			5	5-70	"stream temperature" - Add the report citation here.	after temperature, added "(Butcher et al. 2011)"
34			5	5-71	delete involvement	deleted "involvement"
35			5	5-72	delete has	deleted "has"
2-3			5	5-28	Define as the "Beechie method" here or in whichever section you first discuss this.	Defined.
23-24			5	5-29	This sentence needs a citation.	"(Isaak et al. 2011)" added
		5-1	5	5-30	What does developed mean in this context?	The reference is to application to all stream miles except on developed land. This has been clarified.
		5-2	5	5-31	Are these all modeled temperatures in 100 years or are some in the 300-400 year time frame? I thought it was current climate modeled with these different variations, but the above text makes it a bit confusing.	This shows change in predictions under current climate with the assumption of full natural/restored conditions. Note that this is in the section on Existing Conditions, which does not address climate change. Table title has been clarified.

Qualitative Assessment Peer Review Comments

Line	Figure	Table	Commenter	Comment Number	Comment	Response
				2	2-02 5.1 Climate Risk Section 5.1.1 would benefit from some discussion of how cold-water seeps or other localized sources of cold water might affect water temperature and its relationship to air temperature. The overall discussion of trends and climatic variability is well done in this section, especially the recognition of the PDO phases and the distinction between long-term trends and short-term variability in temperature, precipitation, and flows. Discussion of climate change at a national level seems too broad for this analysis. Consider replacing the first paragraph with a discussion of PNW regional projections rather than national. Similarly, the key findings listed for the WA climate change impacts assessment could be limited to relevant changes, i.e. not health effects or impacts on Yakima reservoirs. I think it is acceptable to continue to use the CIG climate and hydrologic simulations that are based on the CMIP3 climate models, but this section should at least acknowledge that a new set of climate projections are available from CMIP5. VIC hydrologic simulations with the CMIP5 climate data were done as part of the Integrated Scenarios project. The CMIP3 and CMIP5 datasets are not that different and my understanding is that the CMIP5 data has some high-elevation cold-biases that affect snowpack and therefore streamflow. However, some climate impact assessments in the region are now using CMIP5 data and most people in the climate community are aware that they exist and would want an explanation of why the newest available data was not used in this analysis.	Added paragraph on cold-water refuge availability in SF to 5.1.1.1 (see second paragraph). Regarding the discussion of climate change comment: Partially agree, 5.1.2 Future Climate Risks, footnote 14 on page 31, was added to clarify the use of localized downscaled CMIP3 data and associated scenarios used in this assessment. Partially disagree, an explanation of why the newest available data (CMIP5) was not used in this analysis was not deemed as necessary, potentially confusing to the reader and inconsistent with the "Quantitative Assessment (Butcher et al. 2016). The simple answer is the CMIP5 dataset was not available at the time this research project was initiated (2012) and this was recognized in the 2013 Research Plan (page 15 – footnote 6, EPA/600/R/13/028).
2				5	5-27 Change "In Beechie et al. 2012, the authors presented" to Beechie et al. (2012) present	changed to "Beechie et al. (2012) present"
				1	1-15 This section is off to a good start, and I realize that this will be updated based on future evaluations. The authors seem aware that there is still some work to do.	Section was significantly expanded and strengthened
				3	3-5 As I have discussed with the Nooksack folks, I think that the next step in this process is to see if we can further refine the modeling/science on the specifics of on what and where we spend our limited climate impacts and restoration funding dollars to give us the most impact on reducing temperature increases. As an example, if we have 3 million dollars to do restoration work in the South Fork Nooksack and we want to reduce main stem temperatures in the lower South Fork Nooksack, do we spend that money on main channel log jams, main stem riparian restoration, or flood plain reconnection. Which action or series of actions will get us the most impact?	A way to act is better defined through steps of how to develop a plan to match the watershed that needs to be conserved. There are lots of opportunities for involvement included. Instead of just stating to fix it, the new section has how to fix the problems in the stream and surrounding area.