Comment #	Page	Line	Reviewer	Color Code	Reviewer Comment	Author Response
1	ii	22	Jenny Knoth	Yellow	Why is this preface necessary? What is the main point? Seems like a distraction from the study plan and is information that can be transmitted in a memo along with the study plan.	The Project Team feels the preface is helpful to introduce the topic. This is consistent with how information is presented in the PHB Study Design.
2	ii	25	Julie Dieu	Green	I am very impressed with this document - for being well written, well edited, and thorough in its presentation of the DPC Study Design. I like that ISAG split the two study designs, but leverage the same field sites and effort. I like that small pots of existing data have been used to flesh out an analysis strategy that is unusually complete for a CMER Study Design. Well done Project Team, PM, and ISAG!	Thanks! Please note, we did not accept the suggested capitalization of study design for consistency with PHB study design
3	ii	41	Jenny Knoth	Yellow	Spell out in this first use please. First use in the summary, then first use in the main body. Many readers skip summary and go straight to the main body. e.g. I'm skipping the preface as it doesn't directly impact study design.	Added
4	ii	46	Jenny Knoth	Yellow	Suggest replacing this sentence with: PHB characteristics will be identified and assessed in a companion study with the intent for use in a (the?) Fish Habitat Assessment Methodology (FHAM), also currently under development. I think the verb "developed" is not right here, trying to help find another way to say it. We aren't developing physical characteristics - we are identifying (and assessing, of course) a set of characteristics that fit the definition described in the prior sentence. Also trying to fix the competing conjugation of the verbs with will and would in one sentence. (Did I mention that my mom is a retired school teacher?) Alternatively another suggestion: Related to DPC, potential habitat breaks PHBs are defined as permanent, distinct, and measurable in-channel physical characteristics that limit the upstream extent of fish distributions. Both DPC and PHBs are components of a Fish Habitat Assessment Methodology (FHAM) currently under development.	See edit. We used most of your suggested sentence with “The PHBs threshold criteria” instead of “they.”
5	iii	60	Julie Dieu	Green	Fix font size on "1."	Done, thank you.
6	iii	70	Jenny Knoth	Yellow	EOF? EOFH? First use...	Spelled out
7	iii	71	Harry Bell	Yellow	I would be surprised and suspicious if the sample size of sites just happened to be equal. See later related comments.	Sample size estimations for each study are covered in the stats appendices of their respective study design documents (see Appendix C and Appendix D, Sample Size Approximation section). In both cases we are allowing for some attrition of sites over the life of the study. See responses to your related comment in “Integration with PHB Study”
8	1	149	Jenny Knoth	Green	I did not review the tables or glossary for accuracy. Skipped those sections.	Okay - it’s the authors’ task to verify these things after any changes are made and it is not expected that reviewers would cover this.
9	1	173	Debbie Kay	Green	It is common in our area to also consider a smaller channel's connection to large areas of suitable off-channel habitat when indicating DPC. These may be in-line with a larger channel system. This may not be the official rule, but it's very common in practice. Perhaps it's an intersection of rules.	In the situation described (channels with “in-line” connectivity to larger channels, as opposed to tribs) the width of very small channels like this are added to the widths of all other channels in a cross-section (transect), i.e., they are part of the bankfull width of the larger channels, and as such they would fall within the DPC for width. If they are d/s of OCH, they are Type F regardless of size like everything else d/s of other F waters due to the cardinality rule.

10	2	196	Debbie Kay	Yellow	We can only accurately distinguish the DPC based on current fish populations and distributions within the watershed. Suquamish Fisheries numbers show runs at 10% of what was there in the 80s. There needs to be some way to identify areas that are available for use if higher populations are returned to systems. This is less necessary where these end points mark an area where the laws of physics make it difficult for a fish to go further. In flat areas where gradient is never high, F waters begin to run dry in the spring and the highest point of headwaters are commonly wetlands that provide excellent winter habitat, the final rules need additional considerations in addition to fish presence.	DPC are designed to account for ("encompass") habitat suitable for use regardless of presence, and regardless of whether absence is due to depressed populations, d/s manmade barriers, both, or other factors. Depressed populations will influence the degree to which DPC coincide with EOF/H ("alignment"). The DPC help us by identifying locations where we need to bring these other factors into consideration.
11	3	205	Harry Bell	Yellow	Maybe clarify that DPC is the regulatory F/N break when no surveys are done.	They are not considered regulatory type breaks until they are verified AND the DNR water type map is formally changed (or verified) via WTMs. Until then they are informal "FPA-only" F/N breaks (maybe regulatory for RMZ determinations for this harvest rotation only, but not permanent and not for WT purposes). See line 389.
12	3	221	Debbie Kay	Yellow	If small, low-gradient streams are included in this distribution, the distances will get lost in the data. These streams are often on islands or peninsulas that may just be a few miles wide and streams are relatively short in many cases. Perhaps an additional metric of those additional lengths as a proportion of overall stream length may be a way to tease that out. If those streams are not represented within the study sites, this idea needs to be preserved somewhere.	We should be able to analyze these distances (and direction) and to see how they vary relative to stream widths, alone and in combination with other attributes like gradient - along with ecoregions, etc. If very small low-gradient streams in the Puget Sound area are more likely to see fish use we should be able to tease that out and detect that signal. Co-variate analysis will be important, and is intentional, specifically so these nuances and relationships are not lost in pursuit of "dumb averages" that do not tell us what we need to know to facilitate water typing to an acceptable level of accuracy. Can you please clarify exactly what the percentage is that you're interested in?
13	3	224	Julie Dieu	Yellow	You use this word a total of 15 times. I'm not sure what you mean, but suspect that "topographic" would better serve to cover aspect and confinement, and maybe topographic/lithologic if you mean to include the local geology. "Geophysical" really means the set of studies about big-scale earth processes like earthquakes and I have never seen it used this way.	We changed this term to ecogeohydrologic. This term is used in this paper: Ecohydrogeology: The interdisciplinary convergence needed to improve the study and stewardship of springs and other groundwater-dependent habitats, biota, and ecosystems (Cantonati et al 2020)
14	4	237	Harry Bell	Yellow	Why is this sufficient, or not? How does this relate the sample size determination in Appendix C?	Is this comment sufficiently addressed in light of responses to comments in Appendix C?
15	4	260	Jenny Knoth	Yellow	Something isn't right here as is took me several reads to maybe understand. Maybe replace "it have..." with "there is a high degree of accuracy, risk is minimized, and the remaining uncertainty is balanced." I think this is a quote from a source? anyway what is the balance between?	See edit
16	5	266	Debbie Kay	Green	What was intended in WAC was a permanent, highly accurate model/map. This has not yet been achievable and continues to be unlikely for the foreseeable future. Did the Board or TFW Policy ever rule on whether the current water typing strategy was a pivot from that map?	The statement is true regardless. Policy and Board members are cognizant of the longer-term goal of creating a regulatory model-based map sufficiently accurate that all stakeholders would accept it for delineating regulatory F/N breaks. All involved seem to also be aware that the likelihood of achieving this goal any time soon is low. Given that the "interim" rules have already been in effect for 20-23 years, and the series of water typing studies now queued up to inform future rule changes, the interim rules might prove to be longer-lived than the "permanent" ones. The model and model-based map are still included in the Board-approved WT Strategy. TFW Policy and the Board have accepted (so far) ISAG's project sequencing recommendation to complete the PHBs, DPC, and AFF studies before further work on an improved model, because we first need to know what we would be trying to model.

17	5	282	Debbie Kay	Green	Do ponds and impoundments include off-channel habitat floodplains and all wetland types that constitute off-channel habitat? If so, in which category are stream channels with connections to series of these systems?	See clarification. There is overlap between “ponds and impoundments” and OCH, but they are not synonymous or interchangeable terms. Only the ponds and impoundments fraction of OCH has specific DPC criteria (thresholds for size and some qualitative requirements) spelled out in WAC WT definitions. These are currently only in the -031 interim rules under Type 2 and Type 3. OCH is defined as Type 2 water under -031. Its designation hinges only on connectivity and access, with no DPC specified other than a gradient threshold for the connecting channels. Type 2 waters under -031 also have different DPC for ponds and impoundments. Type 2 waters have never been subject to downgrades via the current WTM process (see BM Sec.13). Periodically inundated areas of associated wetlands are part of the BFW definition, and might also be considered OCH. They do not need OCH designation for protection because where present they are already part of a Type F water’s BFW. Portions of floodplains that are periodically inundated and associated with streams but are not wetlands are not considered OCH, because they are just temporarily flooded terrestrial habitats, not “waters”. This study does not specifically sample for ponds and impoundments in regards to DPC.
18	6	287	Julie Dieu	Green	I realize that the authors take this for granted, but this early in the document I think the reader needs to be clear on this point.	Thank you, suggestion accepted.
19	8	347	Julie Dieu	Green	"However" sounds like you're talking about a different paper. I do appreciate that you broke this discussion into a couple of sentences.	Accepted, thanks
20	9	371	Debbie Kay	Yellow	Access to off-channel ponded and floodplain habitat is also a large source of flow in seasonal systems. If the area is flat enough, there is minimal scour and the bankfull widths can be deceptively small, especially when they run through a bigger seasonal wetland.	Bankfull width does not technically exist where there is insufficient hydraulic power to form an alluvial channel, but under the regulatory definition of bankfull width the associated wetlands described here probably define the bankfull width even if they have small channels within them. OCH currently (-031) requires connectivity via a drainage with <5% gradient, which does not require a defined channel and would include swales without defined channels. Under -030, Type 2 disappears and is subsumed into Type F, losing any higher protections it previously had under Type 2. The -030 requirement for OCH is simply connectivity and accessibility with no gradient threshold specified for connecting channels.
21	10	378	Debbie Kay	Yellow	DPCs are also used in locations where downstream anthropogenic blockages prevent the use of water typing surveys.	Upstream of manmade barriers “physical characteristics” are used to determine water types, but Type F does not necessarily extend upstream to the absolute extent of DPC. In part this hinges on which species are present and would be likely to use the habitat if they had access. Presence of natural complete barriers to upstream fish movement further upstream than the manmade barriers might have DPC waters above them, but with no resident fish they would not be Type F. Streams above complete natural barriers that flow only seasonally and therefore cannot support resident populations are another place where “physical characteristics”, but not DPC, would be determining factors for WT calls.
22	14	453	Julie Dieu	Green	Please reference most recent, and put the reference into the references list.	Done, thank you.
23	14	453	Harry Bell	Yellow	I would be surprised and suspicious if the sample size of sites just happened to be equal. See earlier comment.	See stats appendices. The sample size estimates for the PHBs study were based on variabilities of the physicals (gradients and widths) at and around known EOF/H points to begin with, so those numbers should be appropriate for examining the physical characteristics of streams at and around EOF/H locations. The current DPC have fixed values that are already established, so they will have one location for each site, and we expect those locations to be very stable at most sites, though we are assessing for deformability and/or mobility of these points. We are interested in the frequency distributions of distances (and directions) between EOF/H under each PHB definition and the end of current DPC for both “alignment” and “encompassment” analyses, regardless of sample sizes needed to characterize DPC deformability or locational stability alone.
24	14	466	Harry Bell	Yellow	Will the GIS data have sufficient resolution to distinguish the small differences among the unequal length segments?	Things like incremental changes in confinement, distance to divide/from d/s confluence, and basin area might be a stretch where segment lengths are short, but coarser items like precipitation, ecoregion, WRIA and WAU, and geology should be okay.

25	14	470	Harry Bell	Yellow	Great! But I would like to see some characterization of errors when applied as such.	This is covered under the statistical analyses (see Data Analyses section). The errors will be included. If we find something useful in conditioning if-then statements, we will surely examine and try to quantify the potential to reduce errors.
26	15	477	Jenny Knoth	Yellow	This phrase is used just a sentence later. Redundant, remove	Deleted, thanks
27	15	482	Harry Bell	Green	Really good!	Thanks
28	15	486	Harry Bell	Yellow	How will you accurately locate these points on the ground?	See response to your next comment.
29	15	494	Harry Bell	Yellow	Can you accurately locate these? If not is there some standard field guidelines that can be developed to help?	We are using these points to select streams for the study but generally not to determine survey starting points - though the two will likely coincide in many cases. Accurately locating the modeled mapped points is not particularly relevant to the study beyond finding the right confluences. We are not testing the accuracy or validity of the models used to generate these points for the DNR hydro layer c. 2005-2006. The distances and directions by which they err is also largely irrelevant for our purposes.
30	15	499	Jenny Knoth	Yellow	This document has led the reader to believe the sites have been selected as part of the PHB study and that the DPC study uses the same sites. Is this correct? If so, then the future tense is incorrect. Nonetheless, the design incorporates spatially balanced sampling whether or not is has been completed. So present tense is appropriate.	See revised paragraph.
31	16	506	Jenny Knoth	Yellow	is there an alternative to R? could SAS or matlab be used if we prefer BAS or HIP? I know R is free, and GRTS will do the job. Just wondering if this is a restriction or a choice.	See revised paragraph.
32	16	516	Julie Dieu	Yellow	I like that you have discussion, and do agree with you. But I don't think you quite hit the nail on the head. Maybe there's a way to more directly say "We understand that underlying lithology and precipitation patterns control channel occurrence and type, but we are not directly evaluating these covariates. The physical characteristics of the channel, while symptoms of the controls, are what fish experience and make sense for us to measure and evaluate."	Thank you for the suggested language. We have incorporated elements of it in this paragraph.
33	17	529	Harry Bell	Red	Here is what the FPB requested: “The Board also instructed the Science Panel to stratify sampling by ecoregion,” Ecoregions are much more fine grained than east side/ westside. This is in direct conflict with the request. If not done now please explain how when and why it shouldl be done and put it into the CMER workplan.	We are using ecoregions as a covariate, but we are not stratifying a priori based on a covariate that might not be significant. Note that unlike direction to the previous project team c. 2018-2019 the direction to stratify by ecoregion was not repeated to us when the project was handed to ISAG for re-development. Differences in fish species assemblages track more closely with the E-W distinction than with ecoregions, which are oriented to differences in vegetation. The distributions of fish, PHBs, and DPC might vary by ecoregion, but we have no reason to think that the nature of the fish, the PHBs, or the DPC will vary similarly. (From PHB Study Design development)The Ecoregions sub-subgroup of the PHB project design subgroup has concluded that Ecoregions should be used as an analysis factor but should not be used to stratify the sample selection à priori. Stratification of a sample is used when there is a strong basis to believe the stratification factor is correlated with the dependent variables being measured. In so doing, the ability to investigate and show relationships with other factors is hindered. While it is possible that there is something about ecoregions, particularly precipitation patterns, that might cause differences in the barriers to fish movement, there is no strong reason to restrain the analysis of results to that factor at the expense of our ability to investigate other, potentially more important factors. We agree that there are likely to be differences among ecoregions in where the fish and barriers to movement occur on the landscape but identifying those spatial patterns of occurrence is not the purpose of the PHB study.

					The underlying geology of an ecoregion and the precipitation (amount and timing) could certainly contribute to DPC differences BUT I wonder if the adaptation of the fishes in those regions as an interaction with the physical features matters more. Is the point that ecoregions will not be considered a cofactor or that the spatial sampling will ignore distribution across the ecoregions?	
34	17	529	Jenny Knoth	Yellow	I agree that the purpose of this study is not to identify the spatial patterns - but I still wonder if that might pop up as the data come in.	See response to Harry's comment in same comment thread.
35	17	529	Jenny Knoth	Green	I think I see the answer in the next paragraph...	Okay.
36	17	533	Julie Dieu	Green	Trying to fix extra return problem.	Thanks. We will double-check this formatting in the final clean version.
37	18	547	Harry Bell	Yellow	I am confused about what you call ecoregions. Are there only two (eastside/westside) as indicated by the Appendix C sample size calculations? Or are there many as indicated here?	See Figure 4, above. Ecoregions fall within one of the two wider east vs west regions. Those wider regions are related to both the Board's direction to us and the structure of the current water typing rules. Sample sizes are based on the wider regions because we are not stratifying by ecoregion. The number of sampled sites in each ecoregion was approximately proportional to the number of sites occurring in the sample frame in each ecoregion.
38	18	552	Harry Bell	Yellow	How will you determine the adequate sample size? What precision levels?	This will depend at least in part on initial analyses after year one to determine whether we are observing greater variability within or between ecoregions, and within or between the wider east vs west regions.
39	18	562	Harry Bell	Yellow	will?	Agree, changed
40	20	594	Harry Bell	Yellow	How will you consider F/N breaks that were moved upstream from the last observed fish in order to include similar habitat	We are looking at EOF and EOFH as determined by each set of PHB criteria at every site, and comparing all of these to end of DPC locations. Where we have them, fish locations from previous surveys/WTMs will tell us something about longer-term variabilities of EOF. We are not specifically testing the effectiveness or validity of any EOFH calls from streams where previous WT work has been done.
41	20	594	Harry Bell	Yellow	Are we concerned with variance among species? Sculpins vs. salmon/trout?	Yes, we are looking at fish species as a covariate.
42	21	619	Julie Dieu	Yellow	Please explain this a little better, like with an example. "Notes on any frame error or reasons for nonresponse" is awfully conceptual for a field decision.	Thanks for noticing. We moved this to the paragraph above and clarified language. Most site rejection decisions will be made prior to study crews being on site and involve the project team.
43	22	645	Harry Bell	Yellow	Is there a plan to look at species? For example, sculpins in the coastal ecoregion that tend to stay in very small reaches?	Yes - fish species will be included as an attribute and examined as a covariate.
44	22	664	Harry Bell	Yellow	What about conflicts among regional experts?	In that case the Project Team would have to referee the call on a case-by-case basis. An overabundance of region SMEs is not a problem we anticipated having, so it has not yet been discussed. This should be included in our methods manual.
45	25	737	Harry Bell	Yellow	If surface water elevation is important, once a year my no characterize it very well.	We are only calculating water surface elevations at the time of the survey and at bankfull elevation - not looking for average values that would require multiple measurements over time. Our data collection methods will be consistent and applicable to all stream types surveyed.
46	25	745	Debbie Kay	Yellow	Do you have plans on how to apply the data to unconfined and/or seasonal streams? Would this be an additional study?	The statement addresses only what we anticipate encountering based on the distribution of sites in the sample draw. The protocols would not differ for unconfined streams, but confinement is one of the attributes for which we will gather data and it will be analyzed as a covariate. Unclear what is meant by "applying the data" to unconfined and/or seasonal streams. Flows are also a covariate. BFW is the attribute used as one criterion for PHBs and DPC, and wetted width relative to BFW will be one measurement we look at in assessing the influence of flows at the time surveys are conducted.
47	26	765	Harry Bell	Yellow	When field checking new crews for forest inventory data collection, I found that same day or next day independent checks allow for quickly fixing problems.	Yes, we agree. That will an element of the QA Plan, separate from the actual crew variability study element.

						It is not unique. Use of variable-length segments having similar characteristics is common for work involving streams. Use of regular stationing at fixed intervals results in segments having substantial changes occurring within them, which in turn leads to segment-scale attributes that are not representative of changes relevant to fish/fish habitat and that do not reflect the reality on the ground.
48	27	796	Jenny Knoth	Yellow	Is this procedure unique to this study or has this data prep. process been used before?	We did this in a pilot analysis and this step will be conducted jointly for the PHB/DPC analyses.
49	28	815	Debbie Kay	Yellow	Possible additions to those covariates could be water source of reach (snowmelt vs groundwater vs combined), hardrock vs softrock and elevation could include the full extent of elevation range of the watershed (both elevation change to top of watershed and to mouth of stream).	A source hydrology study is well beyond the scope of these projects. We are already including HR/SR geology, elevation, and both distance to the divide (top of watershed) and distance to next confluence d/s involving a stream order change. Elevations for the last two items should be doable with GIS if there is interest, need, and budget. See Table G-7 for added attributes
50	30	857	Jenny Knoth	Green	Helpful figure and caption.	Thanks!
51	31	881	Jenny Knoth	Yellow	Is "modeled" the right term? These variables will be analyzed and the data points could possibly be used to predicatively model behavior (outcomes). Otherwise, what is the model that will be used?	Changed to “analyzed”
52	31	884	Harry Bell	Yellow	How will you quantify crew variability (bias?) and how will you fix it? Also, crew variability will likely be a function of crew training on the use of field measurements protocols. The protocols should be such that can be easily learned by practitioners who will be locating DPCs during FPA applications and approvals.	We agree. This will be part of the QA Plan. In regards to quantifying crew variability, it will depend on the attribute being measured. See Appendix D for more on crew variability. How to quantify crew variability has been a subject of much discussion within the project team and with the statisticians, and we have some options. The distances between the end of DPC points ID’d by the different crews (from each other), and reasons for those distances, might be more informative than variability in terms of distances from EOF points - which can be a mile or more downstream in some cases, particularly where substantial barriers come into play much lower within some basins. To HB’s last point, people seem to have been quite comfortable accepting and approving WTMs and FPAs with water typing work under current rules and guidance for well over 20 years now using basic field instruments - clinometer and d-tape. We will not be developing protocols for practitioners (outside of our scope) - just for our research purposes - but as mentioned in the study design, the things we learn about crew variabilities and their drivers can help inform development of guidance for practitioners. The “implementable, repeatable, enforceable” mantra is our constant companion and advisor in all of this work.
53	31	891	Harry Bell	Yellow	Will the regression tree analysis reveal and test for significant interactions between these metrics?	Yes, see Appendix D.
54	31	899	Harry Bell	Yellow	I question if the sample 190 size and sampling design will provide much useful for biogeo climatic zones or any other stratifications that are more fine-grained than eastern vs. western Washington.	Sample size is based on recommendation from contracted statistician, WEST. See Appendix C. The sample sizes are based on the east-west divide, but analyses within, between, and among ecoregions will help us to characterize variability within those two important regulatory bins, and between them. There has been no suggestion of developing different rules for each ecoregion. Note that the current sample size is ~40% greater than what CMER and ISPR already approved in the previous study design, which was stratified by ecoregion. With a spatially balanced sample we should not be lacking in data at the ecoregion scale.
55	31	905	Harry Bell	Yellow	Will these models, and the associated sample sizes, specifically allow tests for significant interactions among metrics, regions and ecoregions?	Does your next comment (right before Table 2) indicate that this is adequately addressed? See also Appendix D.
56	32	928	Harry Bell	Yellow	Great!	Did this address your previous comment?

57	32	929	Julie Dieu	Green	I printed a hard copy, and while "1" remains "1," the next questions are numbered starting at 7, 8, 9. Same problem with the version of this table down in the Appendices, but after "1" it started at 12. Not sure how to fix this, but don't want ISPR people to wig-out and get confused.	Thanks for noting this. We will double-check formatting in final clean version.
58	35	931	Debbie Kay	Yellow	Potential challenges also include how to maintain accuracy in finding fish while accounting for low population streams and how they change the distribution of fish within the watershed.	By “accuracy in finding fish,” we assume you mean detection probability and not probability that fish will be present and therefore detectable. Depressed populations will not change the locations of the upstream end of DPC. They can explain some of the differences between EOF/H and upstream end of DPC, i.e., lack of alignment, but they should not reduce encompassment. We are not trying to develop fish distribution maps. We are surveying 350 sites, each multiple times, and believe our results will adequately capture the full range of stream conditions on the landscape. We will be consulting with regional experts on optimal timing for surveys. See also “Recommendations and Best Practices Regarding Electrofishing” (June 27, 2016; question 11).
59	35	931	Jenny Knoth	Red	As written this be Challenges and Limitations.	Agree, see revision
60	35	933	Harry Bell	Yellow	What about field location of sites from DNR maps or models?	We assume you mean identifying the correct stream that the DNR map points refer to. We are using LiDAR, LiDAR-derived hydro, aerial photos, and any other relevant resources to identify the stream intended during the desktop analysis. See also response to your comment in Sampling Frame and Study Sites
61	35	935	Jenny Knoth	Yellow	suggest replacing this with "duration of the study time frame."	It is more than just remaining accessible for a duration of time - it also involves access at these specific times within that duration (snow, road closures, ownership changes, etc.)
62	35	938	Julie Dieu	Green	Hmm, I'm looking at Jenny's comments and trying not to reconsider mine. I thought this was an unusually good job at clarifying challenges, but I do particularly agree with Jenny that there will be lots of site-specific difficulties.	There are myriad potential site-specific difficulties but we do not need to articulate each individually. Reasons for any site being dropped or rejected will include solid documentation of the reasons. Substantial site reconnaissance effort is an acknowledgement and effort to reduce those field challenges.
63	35	942	Harry Bell	Yellow	I recall when most of the landscape between Aberdeen and Raymond (and further south) was a clearcut. Given changes in flow it is hard to believe that there were not changes in the extent of fish use that may have or not recovered.	The distribution of fish use may have changed but the channel characteristics that were associated with uppermost fish use likely did not change. Clearcutting was just how things were done in the era described. I think the point here is that this did not differ much between ownership types then, and most rules today apply to both large and small landowners. The study is not designed to address population and distribution changes across these longer time frames - just over the three years of field sampling.
64	35	949	Julie Dieu	Green	Extraordinary foresight - maybe us old dogs in CMER can learn lessons!	Thanks! Once us old dogs have learned the same lessons the hard way a few times it does eventually start to sink in.
65	36	978	Harry Bell	Yellow	Are there some recent publications that address study periods and weather variation and climate change?	This topic was raised in ISPR with the PHB study. Here is our response: Thank you for pointing this out. We discussed the limitations of the sampling strategy (long term climate trends, etc.) and have also added/edited language at the end of the 'Expected Results and Additional Studies' section. We do think it is a good idea to look at this information and where our sample years fall post-hoc. It is worth noting, however, that the intent of PHBs is to be associated with permanent physical changes in channel character that are not necessarily dependent on flow so this may/may not be an issue. RE the comment about, "sampling fewer sites over more years", we could always extend later if needed and funding/support was there for that. Based on sample size analysis conducted by Leigh Ann and to ensure adequate coverage by eco-region sampling fewer sites would not be recommended and current sample size is necessary to address spatial variability needs. It was a choice. Greater spatial coverage or extended temporal sampling.

66	36	980	Jenny Knoth	Red	This statement sounds like it intends to discount the study's ability to meet it's objective of trying to estimate the EOF DPC relationship. As if to say - "Why do it at all?" I agree that 3 years only captures the 3 year period but this is ecology and we will NEVER have a time frame that isn't "moving". So the limitation is that we can't capture the full impact of a broader climate cycle in three years. By visiting many sites, we'll have a good sample size to try and eliminate the background noise of climate on the EOF-DPC relationship as a whole.	See revision.
67	36	982	Harry Bell	Yellow	The recent request by the FPB to CMER was to adjust the HCP S1 targets to consider climate change. It seems like a recommended longer-term plan should be developed and included in the CMER work plan or included in the Extensive Monitoring study being developed in RSAG or both.	Okay.
68	36	982	Jenny Knoth	Red	rambles a bit. Challenges Potential challenges anticipated during the execution of this study include: issues with the selection and subsequent access to selected study sites; variation between field crews; and sufficient funding for the duration of the study. Past studies indicate that locating sites and attaining continued access to initially selected sites for the duration of the study can be problematic. As described, the Survey Design incorporates a process for replacement site selection should a site from the initially selected sample be rejected. All reasons for site exclusions, once selected, will be documented. Examples of access challenges that are difficult to foresee include a change in accessibility between or among seasons and years due to changes in landownership or as a result of a natural process such as heavy snow, road failures, or wildland fires. In such cases, we would continue to sample sites during other seasons and years when possible. The recommended sample size includes sites in addition to the minimum number calculated to meet the specified statistical requirements. This allows for some site attrition over the life of the project. Consistent identification of the upstream extent of DPC by different field crews, across sites and time has been identified as a potential challenge. Quality assurance measures and analysis of crew variations are described	We incorporated the element of potential funding loss.
69	37	998	Jenny Knoth	Red	PHB study has been presented as a concurrent study throughout. It needs to be addressed here as well.	See added paragraph.
70	37	999	Harry Bell	Yellow	Include in the glossery	Added to Glossary and Acronym List
71	51	1401	Harry Bell	Yellow	Give full name here.	Inserted as footnote
72	52	1429	Harry Bell	Yellow	The little spots upstream of the last two PHB's look like fish and are confusing.	The figure is not modifiable, but we have noted this for future figures.
73	52	1445	Harry Bell	Yellow	What criteria, did the board use to make this selection? It is hard to believe that the board had enough understanding of this much detail.	We don't know. Beyond the scope of this document. See Board minutes.
74	54	1458	Harry Bell	Yellow	Great that you did this. Not sure you wanted comments on this but here are a few. Discard if you didn't want comments here.	Thanks, we have responded to your comments.

75	54	1477	Harry Bell	Yellow	What were these? Did the FPB understand and approve? Do they even care?	Described in this memo under “Sample Size Approximation.” The Board’s understanding is outside the Project Team’s scope.
76	55	1500	Harry Bell	Yellow	Not withstanding my comments, it is really great that you had this done.	Thanks. Does this mean your concerns in your previous comments related to this are addressed?
77	57	1557	Harry Bell	Yellow	Why are the above consistently larger than below for eastern but not western data? This suggests bias in how the eastern data were collected.	We believe you are referring to mean bankfull widths above LF point being greater than those below LF in eastern WA (Tables 1-6) vs. those in western WA (Tables 7-9). Figures here are based on an amalgamation of data, not randomly selected across a population - for estimation and illustrative purposes. These may not reflect these trends in the actual study. E WA data included mixed sources that used different protocols - some from early 2000s CMER last fish variability studies, some from WTMFs, and some tribal data (to achieve adequate sample size and sufficient geographic scope), whereas the W WA data are all from WTMs - unclear which side(s) of the state might involve bias, could be either, neither, or both, and all for different reasons. “Pooled across point types” suggests the mix of lateral vs terminal end points might be inconsistent across data sets and betw E vs W as well.
78	58	1591	Harry Bell	Yellow	Why did you do this? With a statewide sample size one side of the state will have higher precision (Probability of a type 1 error) than the other. Also, why did you select precision .10? What are the consequences of higher or lower precision and how will the FPB be able to assess these consequences?	The statewide sample size approximation based on pooled East & West data was conducted to assess whether combining the data across the entire state resulted in higher standard deviations and larger sample sizes than were obtained by combining separate sample size approximations for the East and West sides. However, the larger sample sizes in the pooled data resulted in smaller standard deviations and smaller statewide sample sizes. The Project Team conservatively opted to base the sample size on approximations for each side of the state, resulting in a larger combined statewide sample size. Additionally, please note that relative precision is not the same as the probability of a Type I error (although here alpha = 0.10 and we examined relative precision as low as 0.10). Relative precision of 0.1 implies that the estimated mean is within 10% of the true value with probability of 1-alpha. As the relative precision increases, the margin of error between the estimated mean and true mean gets wider and the confidence interval gets wider. Given that WEST did not have direct PHB data on which to base the sample size approximation, they approximated sample sizes that would result in precise and accurate physical channel characteristic metrics on which the PHB analyses are based. Relative precision of 0.1 (or 10%) is generally very precise in the ecological world. The precision obtained in the final analysis will ultimately indicate the appropriateness of the sample size.
79	59	1616	Harry Bell	Yellow	The upper vs. lower BFW differences between eastern and western data are suspicious. Why are the above BFWs consistently larger than below for eastern but not western data? Even if they are correct I am concerned about pooling across eastern and western data—especially only reaching .15 relative precision.	See answer to your comment in Table 4. Ultimately, the sample sizes based on pooled data were not used, and sample sizes were obtained from approximations based on each side of the state.
80	60	1643	Harry Bell	Yellow	Note that this is not necessarily the ecoregion stratification requested by the FPB. This should be checked.	That was not a specific directive for this study design. See responses to comments above in main document.
81	71	2012	Harry Bell	Yellow	Note that these are for salmon and trout. What about Sculpin's that commonly (personal experience) inhabit very small (BFW) segments?	Fish species, including sculpin, is a covariate. Yes, it is possible our data will have different variances than those calculated here.
82	76	2118	Julie Dieu	Green	Could we call this "Table 1 of Appendix D" as it is confusing here as Appendix A?	See revision