**BACKGROUND**

1. Paragraph 1, line 1: I don’t know if they’ve become “popular” 😊 , maybe “useful”
2. Paragraph 1, line 4: Maybe instead of recently, use “previously”
3. Paragraph 1, last sentence: Reads a little awkwardly. Maybe something like “The previous iteration of QRF models used a single set of covariates across species (Chinook salmon and steelhead) for each of the three life-stages. Here, we further evaluated whether consistent covariates for both species remained appropriate.” Not the best solution, but a suggestion.
4. Paragraph 3, first sentence: Maybe change to “This process resulted in revised QRF and RF extrapolation models that we believe to be more informative…”
5. Otherwise, Background looks great!

**REVISED QRF HABITAT CAPACITY MODEL**

**Covariate selection process**

1. For bullet 1, maybe include what the response variable was for clarity.
2. Bullet 3: Consider “Was the covariate information for restoration project monitoring and/or design?”
3. Dang, I really like your theoretical example!

**Covariate selection results**

1. I like that we can still use one model for both species, per life stage. And I like how you present it. But you might add a statement that we recognize that Chinook salmon and steelhead have different habitat preferences, both for Chinook and steelhead; however, we believe that the same set of covariates can capture those different relationships. Or at least something to that effect.
2. Paragraph 1, last sentence: Looks like you have a broken cross-refererence ☹
3. Juvenile summer:
   1. Can you confirm that Avg. August temperature is synonymous with what’s available from NorWeST? I should know this by now. If they are synonymous, it might be worth stating that somewhere.
   2. I see gradient is used in all 3 models. I think it’s a useful metric and makes sense. But it’s not readily available in our DASH dataset. We may need to go through the effort of calculating gradients for either individual channel units or habitat reaches.
4. Juvenile winter:
   1. Elevation: Same story as gradient. We’ll need to calculate this for channel units and/or habitat reaches. Both could be completed using DEMs, likely at the same time. Might be worth us writing some functions/code.
   2. I have a minor concern that calculating gradient and elevation are outside of the scope I anticipated for this SoW/budget, but I can always seek additional funding if it comes to it.
5. Aside from those, it seems everything is already readily available from DASH.

**REVISED RF EXTRAPOLATION MODEL**

1. Paragraph 1: Can you expound a bit on how random forest methods don’t account for variable strata weights and why additional paired fish and habitat might remedy that? At one point I understood the strata weights, but those days are gone. Maybe just expound slightly in the document.
2. Paragraph 2, sentence 1: Another broken cross-reference ☹

**Habitat capacity estimates**

*Chinook*

1. Are these shapefiles exported and available?
2. For Chinook, it seems that capacity extrapolations are heavily driven/sensitive to elevation. Any thoughts here? Similar for winter rearing, but perhaps less so… maybe more driven by elevation. Although in the Upper Salmon subbasin, I suspect elevation and precipitation are “highly” correlated.
3. Thoughts on redd capacities all being 3 redds per km? 😊Perhaps add one or two decimals for that column to demonstrate SOME variation! But it does seem odd, need to stew on this a bit…

*Steelhead*

1. Hmm, I notice that capacities estimates are greater for the winter than summer. This seems counterintuitive and I don’t recall that being the case in the previous model. Any thoughts here?
2. Same for redds, maybe go out a decimal or two.

**HABITAT CAPACITY ESTIMATES COMARED WITH PREVIOUS QRF AND EXTRAPOLATION**

**Chinook**

1. Thanks for the explanation on increases in Chinook summer parr capacity here. I’m torn. Did you try removing the elevation covariate and seeing how that influenced estimate/maps? Although, perhaps some of that is a true relationship. But then again, there’s historically high abundances of spring/summer low elevation basins like Deschutes, John Day, etc. Although as I type that, the Snake River basin was historically the largest producer of stream-type Chinook in the CRB, but it also contains some lower-elevation productive populations like Potlatch, Little Salmon, etc. Sorry, thinking out loud.
2. I see here that the redd estimates are out to one decimal, which is nice. Perhaps also do this above.
3. What’s up with the scale on the redds map? Seems like an error.

**Steelhead**

1. Same here, seems to be an issue w/ the scale on the redds map.

**SUPPLEMENTAL FIGURES AND TABLES**

**Partial dependence plots**

1. Great explanation!

**MISCELLANEOUS**

* If true, you might mention that the Upper Salmon watershed shapefiles are exported and available from the authors upon request with the caveat that predictions are made for each 200m reach which is perhaps not an appropriate scale for summarizing results and that if summaries are desired, a larger spatial scale should be considered, e.g., tributaries, perhaps every 5-10 km for mainstem reaches, etc.
  + I don’t know the right answer, I just want collaborators to know that results are available, but the scale of summaries and reporting are important considerations.
  + You might also mention that we are in the earliest stages of developing an application for sharing, e.g., a Shiny App or similar, which is a next step.
* Are all figures exported to the repo for use elsewhere, if needed?