

Fish subteam meeting

July 22, 2015

Attendance: Bruce Herbold, Dave Contreras, Brett Harvey, Pascale Goetler, Alice Low, Stacy Sherman, Susie Tharat, Ted Sommer, Jared Mauldin, Matt Siepert, Lori Smith, Ramona Swenson

1. Review of metrics and methods

- a. We decided to change diet studies from a “Special study” to a “triggered” metric, to be triggered by low fish condition. However, this should just be for target species. Gut fullness would be an easier way of addressing this if a program could not afford full diet analysis.
- b. We considered moving otolith microstructure (fish growth rates and life history diversity) to primary metrics. We decided that archiving otoliths should be a primary metric, with analysis of their structure remaining a special study. Many otolith special studies are already ongoing and could be used to analyze collections. Preservation is a consideration – recommend saving heads frozen (or in EtOH) and body in formalin for stomach contents.
- c. Aspects of life history were added to the special study metric list: maternal origin and age.
- d. Acoustic tagging (for large fish) and caloric value of prey could be added to special studies.

2. Review of analysis section:

- P1: Include SFEI’s methods for habitat complexity, for existing conditions. May be a larger scale than you would want though. Pascale knows some more papers looking at habitat structural attributes for salmon in the Columbia (salmon conceptual model has 2 examples).
- P2: The Sommer et al paper cited for P1 should be moved to this hypothesis, since it is about water quality. It’s also important to remember that the site may not be suitable everywhere all the time.
- P3: We should make this metric more specific, ie, water quality of breach, bathymetry of connection to channel, etc. This is more likely a binary variable where fish either do or do not have access, so could be analyzed based on days out of the year with access. Screw trap data from knight’s landing can be used to see whether fish will be in the area and need access.
- P4: RE-word this hypothesis to say: “At-risk fish species will use restored habitat for some portion of their life history, at comparable rates to other wetlands”.
- P14: Reword this hypothesis to read: “Abundance, growth and survival of fish will change based on aquatic vegetation composition.” This hypothesis is likely to be a special study. Add a special study for residence time to the list of metrics.
- F4: Matt Nobrega’s work on fish diets versus prey field would also be a good example of selectivity.

- F5: Could add IRI to this analysis, and maybe stable isotopes. Food web subteam also looked at this hypothesis.
- F6: Re-word hypothesis: “Increased emergent vegetation will increase contribution of detritus and periphyton and other marsh-derived carbon in fish diets”. Add Emily and Matt’s work as example.
- F7: Could add bioenergetics as a special study if you had temperature, but the smelt and juvenile salmon bioenergetic models are weak. Remove zooplankton from the metrics. Include stomach fullness and growth rates using otoliths. This is going to be a tough signal to detect, but that is going to be true for everything.
- S1: Change this to “Fish food quality and quantity will be reduced in the presence of harmful algal blooms”. It is going to be very hard to test this in the field. You can probably do microcystin bioaccumulation in the field, but just looking at prey base is going to be a lot easier. HABs move, fish move, it’s messy. If you have persistent HABS, you don’t have to do that much research to explain why the fish aren’t there.
- S4: Clarify that we are not recommending comparing invasive species to native species abundances.
- S5: Let’s drop S5 because there will be no way of testing it.
- S6 Can use eDNA to search for target species in bird and otterscat. This is really a triggered issue. Or maybe a special study.
- S9: This sounds like we are saying restoration will cause contaminants to increase. We might want to reword it. Talk to the contaminants team about this.

We need to reexamine how we will use the pre-project and reference condition language. There was a lot of discussion of how this would actually go forward. We need to find new language that captures our ideas of what references are but goes in the hypotheses. This could be further explained in a paragraph before the hypotheses.