Final Notes, Skagit Watershed Council
Monitoring and Adaptive Management (M&AM) Subcommittee
April 26th, 2023, 9:00am –10:30am, Zoom Meeting

(<u>Underline</u> indicates decision point; **bold** are action items)

Attending: Mike LeMoine (SRSC, co-chair), Rick Hartson (Upper Skagit Indian Tribe, co-chair), Richard Brocksmith (SWC), Aundrea McBride (SWC), Jen O'Neal (Natural Systems Design)

Guests: Catherine Austin (SRSC), Jenn Johnson

Beginning Business

➢ Introduced: Jenn Johnson is considering joining this subcommittee
➢ Draft Agenda approved by all
➢ March notes tabled until next meeting. February notes still waiting on additions by Mike regarding his and Eric's talk.

Update from Catherine and Response to Comments

Scope of Work Update: Catherine added an extra section to the budget and scope of work, labeled 'worksite #2' for spawner surveys on the alluvial fans. This will cost an extra $9,158 above the $50k set aside and that portion will have to compete with other projects in the grant round (thus portioned out as a separate standalone item). This extra amount was added because the Regional cap went up since the SWC RFP went out, from $50k to $80k. **Catherine will need to go to the LECC workshop meeting in case LECC members have questions about the 'worksite #2' portion of her project.**

➢ See written responses to comments attached below.
➢ Defined alluvial fans as a terrestrial landform. "Serial discontinuity" in the watershed is a good descriptor.
➢ The M&AM and SWC could propose/decide to set aside more than $50k in an RFP. This is a worthy topic for discussion.
➢ Finding other watersheds that are interested in doing the same type of study would be good for expanding sample size (Chehalis?)

Yearling Study by Jen O'Neal and others

This talk was presented at the Salmon Recovery Conference and is in the process for a publication. Looked at yearling stream type Chinook and habitat associations. See slideshow on Box.

➢ It would be good to apply this model to the Sauk Plan using GIS if we had remote sensing data.
➢ How far are project sites from the mainstem and are they used by Chinook?
➢ Colin will send GIS for us to look at.
➢ Note the difference between habitat preference and use.

- Removed fry and parr from analysis using size class distribution.
- Upper limit of distribution from the mainstem occurred in Martin and Taylor.
- Did you monitor in blind channels? Not very many blind channels, but seems there was less fish use further up.
- Could temp sensors be picking up groundwater? 17-20 temp sensors that could be picking up ground water temps, but it didn't seem like anything 'weird' was going on.
- Was there a difference between Skagit and Sauk regarding yearlings after the 2021 flood? Sauk didn't get hit as hard by flooding.

Salmon Recovery Implementation Inventory (PSP, via Cramer Fish-Kristin Connely)

Cramer Fish Sciences has been contracted by PSP to inventory monitoring projects and data as a jumping off point, to include in the Salish Sea Wiki. They are looking for watershed, basin, or region wide datasets meeting certain criteria. Due date is first week of June. Kristin is looking for lists of projects from these practitioners.

- How does this effort overlap with what Jason Hall is doing for the Whidbey Basin? This data has already been collected at a finer resolution. Rick has commented on the floodplain list for Jason. Mike has also spoken with Jason.
- Forest practices data is the only type of monitoring that hasn't already been inventoried by Jason's project as far as M&AM members know. **Aundrea will connect Kristin with Curt Veldhuisen.**
- PSP will do some synthesis of the data (metadata?). This will likely be problematic because it lacks depth.
- There is a report on PRISM data from Taylor consulting. PRISM is not a good source for data (inconsistent metrics and methods, duplicative, data collected and reported with funding goals in mind rather than science).
- We would like to talk with PSP about the duplication of effort. SRSC will not participate in a duplicate effort. ***Mike will reach out to Jason Hall about overlap.** Jason's project on cumulative effects evaluation is likely a more thorough and useful documentation that delves into actual reports and science/numbers (more than metadata).

Announcements

- 4S at June 7th Council of Members meeting will cover freshwater systems
- TWG will have a smolt capacity estimating workshop in May or June

Adjourn 10:30

Monitoring fish in alluvial fans – Research funding proposal
Comments from Skagit Watershed Council Monitoring and Adaptive Management Committee meeting
March 27, 2023, and responses
Catherine Austin and Mike LeMoine, Skagit River System Cooperative
April 2023

1. Is it possible to collect a wider suite of habitat metrics including water velocity, substrate size, gradient and distance from mouth?

   Response: Yes, including these metrics is a good idea to cover a range of possible covariates likely to describe the stream attributes generated by variable geomorphology and hydrology in alluvial fan reaches. This field data collection can be accomplished under the existing Worksite #1 project scope and funding request.

2. Is it possible to include riparian cover in the suite of habitat metrics?

   Response: Riparian cover is an attribute of alluvial fan habitat that may vary longitudinally and affect juvenile fish rearing density. Existing GIS data can be leveraged to contribute this component to the analysis and/or interpretation of juvenile fish assemblage under the existing Worksite #1 project scope and funding request.

3. Can you define upper, middle, and lower reaches in a way that is relevant to other basin tributaries?

   Response: While a simplistic approach is to assume a longitudinal gradient from higher velocity/substrate size/Steelhead Trout rearing higher in the fan to lower velocity/substrate size/Chinook Salmon rearing lower in the fan, some sites may not match that pattern, e.g., the low gradient terrace at the canyon outflow in Goodell Creek. For this reason, we will collect a range of habitat metrics including bankfull and wetted widths, stream reach lengths, channel geomorphic unit designation (Hawkins et al., 1993), gradient over reach scale habitat units (Montgomery and Buffington 1993), and the habitat metrics mentioned above (in 2.). We will use statistical comparisons and model selection tools to help define the relevant covariates, with the goal that the measurement of these covariates could inform juvenile fish predictions (i.e., as closer to floodplain densities or stream densities, as described in the proposal).

4. Is two years sufficient to answer your questions? What about stochastic escapement of Chinook Salmon adult populations?

   Response: We agree two years is a short timeframe for fisheries research questions in general and to cover the possible range of Chinook Salmon adult escapements in the study years. The current scope and funding source do not support additional years of alluvial fan monitoring, although depending on project results we may consider seeking additional funding. However, to address the question of variable Chinook Salmon escapement specifically, one possible addition to the project has now been written up as a separate "Worksite #2 – spawner addendum" in the PRISM application. Washington Department of Fish and Wildlife already geolocates Steelhead Trout redds so we anticipate being able to use those data directly. WDFW does not geolocate Chinook Salmon redds, so survey reach length (up to 2 km) enumerations cannot be used in spatially-explicit analyses at the scale of our study reaches. The proposed project addendum would consist

of additional work by SRSC to geolocate Chinook Salmon redds in the study years as a potential input to the analysis and/or interpretation of juvenile results. In an effort to leverage existing Washington Department of Fish and Wildlife spawner surveys that enumerate and physically flag redd locations, our additional effort would be to visit the study reaches four times over each Chinook Salmon spawning season to geolocate the flagged redds at a sufficient interval to capture data between expected high-water events in later fall.

5. Can you link the project better to restoration planning tools, including 2dFlow models, but including an elevation component?

   Response: We have designed this project as an early stage assessment of the general applicability of observed fish and geomorphology patterns in Illabot Creek to other Skagit tributary alluvial fans. (At this stage we are not attempting to calculate predicted juvenile fish densities in alluvial fan reaches, although a separate effort to develop juvenile fish predictions based on 2dFlow covariates is underway related to SRSC's Barnaby Slough Restoration Project monitoring.) However, our physical habitat covariates in this assessment include water velocity, which is a standard component of hydrologic models. If it turns out that velocity is a strong predictor of juvenile fish density in different reaches of alluvial fans, then existing restoration planning tools like 2dFlow rasters may be able to be leveraged further to help winnow the applicability of floodplain fish density estimates to specific sites in alluvial fans. We do not plan to measure absolute elevation in this work, but gradient is a feature that can be easily measured in the field for prospective restoration projects and may be a component of restoration design models. If this study finds a strong relationship between fish assemblage and gradient, this will likewise allow more accurate application of floodplain fish predictions or other estimates of fish benefit for restoration planning purposes.