GREEN/DUWAMISH AND CENTRAL PUGET SOUND (WRIA 9) IMPLEMENTATION TECHNICAL COMMITTEE

WRIA 9 Implementation Technical Committee Meeting
March 16, 2022 | 9:30 am – 11:30 am
Zoom Link: https://us02web.zoom.us/j/89069145463?pwd=SUhLOHhTVEs2VlhIeTFML0x4V3J2UT09
Meeting ID: 890 6914 5463
Passcode: salmon

9:30	**Welcome & Introductions**	Iris Kemp, WRIA 9
9:40	**Green River Chinook spawning distribution** *Brief presentation with slides followed by Q&A* • WDFW, Muckleshoot Indian Tribe, and City of Tacoma survey Chinook redds annually to estimate escapement. Nik will share results from the past five years of surveys.	Nikolas Novotny, City of Tacoma
10:00	**Juvenile outmigration studies and long-term trends in Puget Sound Chinook salmon populations** *Presentation with slides followed by Q&A* • This project aggregated long-term (12-25 years) smolt trap data across 11 watersheds to analyze freshwater productivity and marine productivity trends in Puget Sound Chinook.	Pete Lisi, WDFW
10:30	*5-minute coffee/tea refresh + stretch break*	All
10:35	**Meta-analysis of project effectiveness monitoring in King County** *Presentation with slides followed by Q&A* • This meta-analysis reviewed seven years of project-level fish monitoring data across nine projects to explore whether fish use restored habitats at higher rates than rip-rap bank armoring and whether fish prefer newly restored habitats compared to control habitats of the same type.	Jim Bower, King County
11:15	**Round Robin Updates – RE-IMAGINED** *Slide deck activity followed by open-floor conversation* • **Pre-meeting prep (5 minutes) –** Please find a slide deck with instructions on slide 1 at this link. Use your slide to include relevant updates from your jurisdiction, project, or team. • During the meeting, we'll have time to review each other's slides and add questions or comments.	All
11:30	**Adjourn**	

WRIA 9 ITC web page: http://www.govlink.org/watersheds/9/committees/ImpleTechCmte.aspx

Participant list:
Alexandra Doty, Chris Gregersen, Cleo Neculae, Debbie Meisinger, Halley Kimball, Heidi Watters, Iris Kemp, Jim Bower, Josh Kahan, Josh Hopkins, Katherine Lynch, Katie Beaver, Kerry Bauman, Kollin Higgins, Marc Marcantonio, Matt Goehring, Matt Knox, Nelson Salisbury, Nik Novotny, Patty Robinson, Pete Lisi, Suzanna Smith, Tyler Patterson

Round-table Updates and Reminders

- Please fill out our WRIA 9 ITC in-person meeting survey by **Monday, April 4:** https://forms.gle/ZQJzhEvaLeyutj6u8.
- Read through our **WRIA 9 ITC March round robin** slides at this link: https://docs.google.com/presentation/d/15qhT-sd5_5WPGqdes9-rYD6yYKI_eXX0yBqIe5vgAX4/edit?usp=sharing. Includes relevant updates from WRIA 9 staff, King County, Puget Sound Partnership, Ecology, USFS, City of Seattle, City of Covington, EarthCorps.
- Please plan a pre-meeting review of materials on this year's Re-Green the Green and Monitoring & Research proposals and bring your questions, thoughts, and recommendations on projects proposed for funding to our April 20th meeting.

Green River Chinook spawning distribution (slide deck here)

Additional materials for context and data interpretation:

- Chinook spawning distribution – redd density by river section, reach, and year
- Green River Chinook Spawning Reaches – reach lengths within river sections

Nik presented results from 2017-2021 Chinook redd surveys conducted annually by Washington Dept. of Fish and Wildlife (WDFW) and the Muckleshoot Indian Tribe (MIT). Surveyors count redds to estimate escapement, assuming 2.5 fish/redd. Over the five years of data, the Middle River and Headworks section represented the highest percentage of total redds. Headworks has the most redds/mile. Please see the linked attachments for more detail. The data presented in this meeting are descriptive and should not be used to imply/impact management decisions.

Questions or follow-ups? Contact Nik at nnovotny@cityoftacoma.org.

Discussion

- Why are Kent and Lower River classed as different river sections?
    - This is the methodology that WDFW & MIT developed and have kept consistent over the data sampling period – refer to their methods. These sections have different habitats.
- Is Soos Creek included in these surveys?
    - MIT has surveyed Soos Cr in past years. However, it isn't surveyed regularly. Soos Cr is predominantly hatchery fish and is lower priority for these redd surveys.

- The four reaches with the highest redd densities are also the four smallest reaches in terms of length. How abnormally small are these reaches compared to other reaches?
    - Headworks is only 0.25 mi long. WDFW chose to define these reaches in this way because of numbers of fish in each. These sections do appear to be where the fish are spawning the most, and Nik thinks those four reaches have the best spawning habitats.
    - Is redd density in these data calculated by dividing by length of spawning reach or by length of subreach – i.e., is it weighted by subreach length to be comparable? Width of spawning reach might be more informative when discussing redd densities.
        - Redd density was calculated as redds/reach length. Determining width of spawning reach to better assess area suitable for spawning would be valuable; Nik currently doesn't have those data. Kollin can share "constrained/unconstrained" assessments in GIS developed via the Water Quality Benefits Evaluation work. Reach width might also be able to be derived from aerial photos.
- Gravel supplementation doesn't occur until the Headworks 3 reach. Headworks 2 has gravel that has been present since the construction of the dam. What were pre-dam conditions?
- Is the Headworks data all spawners? Can it be split into natural-origin spawners vs. hatchery-origin spawners? Kollin suspects that the upper reach is heavily dominated by hatchery fish.
    - It is all spawners. Survey methods include sampling otoliths and scanning for CWTs. Nik doesn't have those data on hand.
    - It would be interesting to see the proportion of Palmer-origin vs. Soos-origin fish. Palmer Ponds is located in the Headworks 5 reach. Palmer hatchery began releasing an extra million Chinook parr in 2020 (total release of 2 million). In five years, these surveys could show the results of the increased releases. Will redd counts in Headworks increase disproportionately?
- Iris will schedule a follow-up conversation. Interested participants: Nik, Kollin, Josh K., Kerry, Matt G., Marc, Matt K., Katherine.

Juvenile outmigration studies and long-term trends in Puget Sound Chinook salmon populations (slide deck here)

Full report here: https://pspwa.app.box.com/s/9wp044gr0346subxe8yqxko26njskire

Pete and co-authors compiled smolt trap data and adult abundance data for Chinook salmon from populations across Puget Sound (Skagit, Cedar, Bear, Green, Skykomish, Snoqualmie, Stillaguamish, Puyallup, Elwha, Dungeness, and Nisqually) to assess freshwater productivity (juveniles per spawner, JPS) and marine productivity (smolt to adult return, SAR) over the past

25 years. Dynamic factor analysis supported a shared trend (synchrony) across populations for both metrics with asynchrony in trends for specific populations. Results indicate some positive signs of resilience with rapid JPS and SAR increases for some populations, support maintaining and promoting habitat diversity to enhance life history diversity and foster cross-population stability and sustainability, and highlight the importance of maintaining complementary juvenile salmon monitoring across many Puget Sound rivers.

Questions or follow-ups? Contact Pete at peter.lisi@dfw.wa.gov.

Discussion

- Were changes in hatchery outputs across time considered? Could the increase in SAR beginning in brood year 2013 be correlated with large increases to hatchery production that occurred over the same time period?
    - We tried to account for hatchery input when we could. The recent spike in SAR occurred in programs without big hatchery increases too. We believe this is a signal of a real change in productivity, not just a change in hatchery practices.
- The productivity metrics in this analysis weren't able to incorporate life history diversity in juveniles – e.g., separating out fry vs. parr outmigrants. Fry vs. parr contribution to adult return is very system-specific and difficult to tease out, but it would be really interesting if possible.
- Next steps include adding covariates to better understand the factors driving JPS and SAR synchrony and asynchrony across populations.

Meta-analysis of project effectiveness monitoring in King County (slide deck here)

Full report here: https://green2.kingcounty.gov/ScienceLibrary/Document.aspx?ArticleID=691

This meta-analysis included nine sites monitored between February-June 2013-2019 with night snorkeling (Cedar River) and night electrofishing (Green and Snoqualmie Rivers) in low-velocity habitats for at least three sampling events per year at varying flows. Meta-analysis allows for different methods across project areas by calculating the log response ratio (natural log of the proportional effect). Main take-aways from the presentation slides: juvenile Chinook prefer any new edge habitat over rip-rap (but may prefer backwater features the most), juvenile coho also prefer restored edge habitats but those with a little more flow (natural banks, biorevetments, side channels) than Chinook. When juvenile Chinook and coho encounter bars, they prefer those that are more dynamic, possibly due to a foraging advantage. All restored floodplain processes support more total species; naturally-occurring, highly resilient geomorphological features support niche habitats suitable for specific species.

Questions or follow-ups? Contact Jim at james.bower@kingcounty.gov.

Discussion

- The captured trout tended to be 1+ but this study did not parse out age or size.? Kerry's observations on projects in the Green River suggest that bigger fish are more comfortable in riprap habitats.
- The majority of coho caught in this study were 0+/young-of-the-year. They were found across all different features, but had significant, consistent preference for higher-velocity habitats than Chinook.
- The dynamic conditions of new edge habitats – features that are actively eroding/aggrading – may offer a prey advantage. It might be related to nutrient content of recently eroded or settled material. Midge pupae are a major food source for these fish. When those eggs settle out, the juvenile animal needs silty, loamy materials to grow – the kind of materials often found in new edge habitats.
- Three years of pre- and post-restoration monitoring across a variety of flows, temperatures, and densities of fish is ideal. This is time-intensive, expensive, and difficult to do.
- Study results represent fairly low flows, since snorkeling and electrofishing can't be done during major flood events.
- We tend to think about a river contained in a valley where the river can move laterally across the valley, engaging a floodplain on both sides. The results of this study support the idea that there are places where rivers migrate up against the valley wall leading to hardened features that are more or less permanent or places with large pieces of alluvium. All have ecological function. In addition to floodplain, other natural features support fish at different times in different ways.