

2023 WRIA 8 MONITORING AND ASSESSMENT REQUEST FOR PROPOSALS

Each year, the Lake Washington, Cedar, Sammamish Watershed (WRIA 8) solicits proposals for the King County Flood Control District's Cooperative Watershed Management (CWM) grant program. WRIA 8 recommends funding for projects that align with the watershed's Chinook Salmon Conservation Plan (link: [WRIA 8 2017 Plan Update](#)), advance understanding of critical issues in salmon recovery, and inform science-based management actions. WRIA 8 welcomes proposals that align with our funding principles and address the high priority monitoring and assessment needs identified in this document.

WRIA 8 Monitoring & Assessment Funding Principles

1. Prioritize proposals that directly inform or advance actions and best management practices to recover Chinook salmon in WRIA 8. However, WRIA 8 will also consider proposals that inform or advance actions and best management practices to recover other salmon species and/or support overall watershed health.
2. Leverage multi-agency collaboration, cooperative partnerships, in-kind resources, or other support to advance salmon recovery. We are particularly interested in encouraging new partnerships and expertise informing salmon recovery in WRIA 8.
3. Maintain ongoing and long-term monitoring efforts, particularly where a failure to implement the proposed work would result in a meaningful data gap.
4. Communicate findings with WRIA 8 partners and other audiences to promote incorporation of best available science in salmon recovery strategies; encourage awareness and environmental stewardship; and/or guide integration of salmon recovery priorities into local and regional planning, regulations, and permitting.
5. Demonstrate careful planning including a robust study design and data management plan to facilitate future uses and application of findings; clearly defined and measurable goals and objectives; appropriate sequencing relative to other monitoring work; and use of reliable methods with a high likelihood of achieving objectives.

2023 WRIA 8 Priority Monitoring & Assessment Needs

Salmon Population Status, Habitat Use, and Survival

This topic is focused on evaluating salmon populations over time and in priority systems. There is also a need to supplement baseline monitoring with more targeted assessments of population parameters including the timing and location of juvenile survival bottlenecks.

Monitoring & Assessment Needs

- Spawner surveys on Chinook bearing systems, prioritizing the Cedar River.
- Juvenile outmigrant surveys on Chinook bearing systems, prioritizing the Cedar River. The screw trap/PIT tag work is primarily funded by WDFW for the next two years but could be enhanced or expanded with additional funds.
- Expand the network of PIT tag detection antennas to improve annual estimates of freshwater survival and help identify locations of high juvenile mortality during outmigration through Lake Sammamish, the Sammamish River, Lake Washington, the Lake Washington Ship Canal, and Ballard Locks (e.g. the saltwater drain screen). Additional PIT tag antennas could also help improve understanding of the migration patterns and survival of adult salmon returning to freshwater.
- Enhanced monitoring of juvenile passage (e.g. using hydroacoustic technology) in and around the Ballard Locks and smolt passage flumes.
- Assessments of potential delayed juvenile mortality following outmigration of the Ballard Locks.

Impacts and Mitigation of Poor Water Quality on Salmon Health and Survival

High water temperatures and low dissolved oxygen can impede migration and cause stress responses that affect reproductive success, increase vulnerability to disease and parasites, and increase levels of pre-spawn mortality in adult salmonids. High water temperatures and low dissolved oxygen can also block juvenile outmigrants or change their patterns of migration and increase vulnerability to predators. With climate change projected to continue to increase water temperatures over time, we seek to better understand and mitigate high water temperature and its effects on salmon health and survival in WRIA 8.

Monitoring & Assessment Needs

- Build off ongoing work of the Lake Washington Ship Canal Roundtable to identify and evaluate solutions that reduce impacts of high temperatures and low dissolved oxygen conditions on salmon in the Lake Washington Ship Canal.
- Evaluate causes and consequences of high temperatures in Lake Sammamish and the Sammamish River and identify opportunities to reduce or eliminate thermal barriers, create cool water refugia, and/or enhance/protect existing groundwater resources in these systems.

Impacts and Mitigation of Artificial Light at Night (ALAN) on Juvenile Salmon Survival and Predation Risk

Artificial light at night is a priority limiting factor in salmon recovery. Ongoing work in Lake Washington and the Ship Canal is focused on assessing historical and future projected ALAN patterns and associated predation risk to identify ALAN hotspots and develop management recommendations that target benefits for salmon. Projects in Lake Sammamish are focused on collecting baseline ALAN data, developing model ordinances, and working with residents to update lighting behavior and reduce impacts. This topic is focused on building on current work and testing strategies to reduce negative impacts of artificial light at night on salmon recovery.

Monitoring & Assessment Needs

- Evaluate strategies or approaches to reduce ALAN impacts on salmon, including alternative lighting technologies (e.g., the use of different lighting spectra, reductions in the amount of lighting, or the use of shielding and shaping to adjust the direction of lighting) or approaches to encourage behavioral change.
- Studies to better understand the influence of ALAN and interactions between ALAN and other types of habitat modification on salmon behavior, health, and survival (e.g., predation by nonnative fish species and birds).

Impacts and Mitigation of Predation Risk

Projects to increase understanding of predation impacts on salmon health and survival and test mitigation strategies. We are particularly interested in investigations of predation by nonnative piscivores and benefits of habitat improvements to reduce predation efficiency and impacts. This category can also include projects focused on strategies to reduce pinniped predation on adult and juvenile salmon at the Ballard Locks.

Monitoring & Assessment Needs

- Identify target locations where predators (e.g. yellow perch, black crappie) consume the largest numbers of juvenile salmon, develop, evaluate, and monitor mitigation strategies.
- Better understand the role of lake nearshore habitat conditions (e.g., invasive aquatic vegetation, human infrastructure) on predator assemblages and/or predation efficiency to inform possible management strategies (e.g., removal of invasive aquatic vegetation, shoreline habitat restoration, predator removal efforts) for reducing impacts of predation on salmon survival.
- Evaluate strategies to reduce pinniped predation on adult and juvenile salmon at the Ballard Locks.

Project Effectiveness Monitoring

Assessments to determine whether restoration projects or approaches are achieving their intended outcomes for salmon and their habitats. We are particularly interested in specialized monitoring that fills key knowledge gaps and/or supports partners with otherwise limited resources needed to conduct this work. For example, when a novel approach is used or when outcomes are uncertain or not well understood.

Monitoring & Assessment Needs

- Assessments of lake shoreline or other lentic habitat restoration project benefits for salmon recovery (e.g., remove bank armor, increase overhanging and emergent vegetation, reduce lighting impacts, and restore a more natural littoral substrate and flow condition).

- Evaluate the geomorphic resilience of constructed off-channel habitats within the Cedar River and other Chinook-bearing tributaries and determine what characteristics most influence the use of off-channel habitats by juvenile salmon.

Data Synthesis with Management Applications

This topic invites synthesis documents summarizing scientific evidence on specific subjects with high importance to salmon recovery in WRIA 8.

Other Uncertainties or Emerging Concerns

WRIA 8 will also consider proposals that address critical uncertainties or issues of emerging concern that are not explicitly included in the topics above. Proposals must have a clear and compelling link to inform or advance salmon recovery efforts. Examples include the impacts of pathogens and diseases, synthetic chemicals, stormwater discharge, and other water quality impairments on salmonid health and survival.