Columbia Basin Collaborative
Predation Work Group
Meeting Summary

Wednesday, September 28, 2022, from 1:00 – 3:00pm PT/ 2:00 – 4:00pm MT

Attendees

Working Group Members in Attendance: Bob Lessard (Columbia River Inter-Tribal Fish Commission), Holly McLellan (Confederated Tribes of the Colville Reservation), Aaron Lieberman (Idaho Outfitters and Guides Association), Anthony Capetillo [IPO Jay Hesse] (Nez Perce Tribe Department of Fisheries Resources Management), Lynne Krasnow (National Oceanic and Atmospheric Administration), Michelle Rub (National Oceanic and Atmospheric Administration), Tucker Jones (Oregon Department of Fish and Wildlife), Bryan Wright (Oregon Department of Fish and Wildlife), Grant Waltz (Oregon Department of Fish and Wildlife), James Lawonn (Oregon Department of Fish and Wildlife), Gary Marston (Trout Unlimited), Tammy Mackey [IPO Sean Tackley] (US Army Corps of Engineers), Michelle McDowell (US Fish and Wildlife Service), Stephen Waste (US Geological Survey), Chris Donley (Washington Department of Fish and Wildlife), Tom Iverson (Yakama Nation Fisheries)

Observers in Attendance: Tom Skiles (Columbia River Inter-Tribal Fish Commission), Tom Lorz (Columbia River Inter-Tribal Fish Commission), Dennis Rohr (DRohr & Associates, Inc.), Keely Murdoch (Yakama Nation Fisheries), Brandon Weems (Confederated Tribes of Grand Ronde), Jerry Rigby (Rigby, Andrus & Rigby Law, PLLC)

Facilitation Team: Amira Streeter (Kearns & West), Angela Hessenius (Kearns & West)

Welcome, Agenda Review, Updates, and Introductions

Amira Streeter, Kearns & West, provided an overview of the agenda and meeting guidelines. The topics included: 1) Overview and Context of the Columbia Basin Collaborative (CBC) and Predation Work Group, 2) Discussion of Resources and Gaps, 3) Work Plan and Next Steps, and 4) Confirm Next Steps, Upcoming Meeting Topics, and Summary. The work group members introduced themselves.

Overview and Context

Bob Lessard, Columbia River Inter-Tribal Fish Commission (CRITFC), provided a high-level overview of the CBC. The CBC was formed to achieve lasting solutions for salmon and steelhead recovery in the Columbia River Basin and implement goals that were defined by the Columbia Basin Partnership (CBP). The Predation Work Group is one of several topic-specific work groups that has been formed as part of a regional approach to achieving the CBP goals. The purpose of these work groups is to provide technical analyses, develop draft recommendations and feasibility assessments for priority actions, and work collaboratively to deliver recommendations to the CBC Integration/Recommendations Group (I/RG). The I/RG will review recommendations from the topic specific work groups and move recommendations forward for implementation by the regional entities, sovereign entities, and federal action agencies.

Bob also provided an overview of the existing data compiled by the CBP.[1] The CBP compiled and ranked impacts to each species broken out by subregion and set low, medium, and high goals for each stock. Using this information, the CBP developed biological matrices including a table that identifies high priority stocks based on the overall impact of predation on that stock and the current abundance relative to the medium goals for population of that stock. Bob shared additional data on the total life cycle predation mortality across stocks and river basins. He framed the goal of this work group as considering and recommending actions that will reduce the impact of predation on all these stocks as effectively as possible.

Tucker Jones, Oregon Department of Fish and Wildlife (ODFW), gave an overview of the three main sources of predation: 1) Avian, 2) Pinniped/Marine Mammal, and 3) Piscine. Tucker reviewed the CBP focal species and examples of measures to address predation in each of the three broad categories outlined by the CBP: Lethal, Non-lethal, and Environmental. Tucker also provided examples of existing predation management programs and infrastructure, which included the following:

- Avian:
    - Caspian tern management on East Sand Island (Began in 2008).
    - Inland Avian Predation Management Program (Began in 2014).
    - Double-crested cormorant management on East Sand Island (Began in 2015).
- Pinniped/Marine Mammal:
    - First California sea lion removals at Bonneville Dam (2008).
    - First California sea lion removals at Willamette Falls (2018).
    - First Steller sea lion removals (2020).
        - Required amendment of Section 120(f) of the Marine Mammal Protection Act (MMPA) in 2018.
- Piscine:
    - Northern Pikeminnow Management Program: Large-scale northern pikeminnow removals (Began in 1991).
    - Bass and walleye bag and size limits lifted (2016).

Discussion of Resources and Gaps

Amira led a discussion of existing resources and gaps related to predation. Work group members added their answers to a series of questions to a Google Jamboard. Work group members shared the following input in response to these questions:

1. **Are there other existing forums programs currently operating that we haven't covered?**

General:

- Mid-Columbia Public Utility Districts (PUDs) predation management programs.
    - Includes avian and northern pikeminnow.
- Water Resource Inventory Areas (WRIAs) in Washington sponsor research and predator removal projects.

[1] Detailed summaries of the data compiled by the CBP are included in the Phase 2 Final Report, available here.

Avian:

- Regional Avian Predation Forum (hosted by CRITFC).
- Fish Passage Operations & Maintenance (FPOM) Avian Task Group (focuses lands owned by and responsibilities of US Army Corps of Engineers (USACE)).
- ODFW coordinates harassment of double-crested cormorants foraging on hatchery releases of salmonids at some locations in the Columbia River estuary.
- USFWS issues migratory bird depredation permits to hatcheries and upper-Columbia River hydropower dams to protect ESA-listed salmonids.
- Avian monitoring has been conducted across the basin in recent years and coordinated by multiple entities (including Bonneville Power Administration (BPA), Washington PUDs, USACE, and ODFW).
- Pacific Flyway Council (includes States, USFWS, and other partners) monitor double-crested cormorant and American white pelican across the west.

Marine Mammal/Pinniped:

- Washington's Orca Task Force occasionally reconvenes to address specific recommendations.
- Washington State Academy of Sciences is conducting a scientific and technical review of the science of pinniped predation on salmonids, with an emphasis on Washington's portion of the Salish Sea and Washington's outer coast.

Piscine:

- Northern Pike Suppression and Monitoring Project in Lake Roosevelt (led by Colville Tribes, Spokane Tribe, and WDFW).
- Pend Oreille River northern pike suppression and efficacy monitoring (led by Kalispel Natural Resources Department and WDFW).
- NW Regional Northern Pike Forum.
- Upper Spokane River smallmouth bass suppression (led by WDFW).
- Walleye and smallmouth bass removal in the Sanpoil Arm of Lake Roosevelt to protect redband trout and Kokanee populations.
- Grant PUD funds an annual northern pikeminnow derby through the Quincy Valley Chamber of Commerce.

2. Are existing forums and programs effective, delivering desired results, and/or having unintended consequences?

Avian:

- Some avian predation measures (e.g., increasing reservoir elevations behind the John Day dam) have increased fish transit time for smolts, which is an important predictor of life-cycle survival.
- The USACE hazing program in the estuary on the dredge placement sites to prevent recolonization of Caspian terns and double-crested cormorants has been very effective; the hazing program at the dams is moderately effective, depending on spill and weather conditions.

- For avian predation, it is not yet clear whether programs have been effective; there is a need to take a long view with highly mobile predators and maintain hazing pressure at points where fish are most vulnerable.
    - There is a need to maintain deterrents to stop habitation.
- It is important to define what is meant by "effective;" several programs guided by federal management plans have manipulated bird abundance and distribution in the basin without realizing intended goals since the birds did not respond as planned.
- Despite major reductions in basin-wide tern abundance, there has not been an apparent increase in hydrosystem fish survival.

Marine Mammal/Pinniped:

- Pinniped management at Bonneville Dam (since 2008) and particularly Willamette Falls (since 2018) under Section 120 of the Marine Mammal Protection Act have been effective at reducing California sea lion abundance and their associated predation on salmonids. Steller sea lion management only began in fall of 2020 but is showing early signs of similar success.
- Preventing the recruitment of new, "naïve" sea lions to upriver sites continues to be an unsolved problem.

Piscine:

- Lake Roosevelt Northern Pike Suppression has been effective at decreasing the abundance of Pike in the upper sections of Lake Roosevelt and preventing the spread downstream.
- The northern pikeminnow program has demonstrated reductions in predation to juvenile salmonids and continues to monitor for signs of predatory compensation.
- The walleye and smallmouth bass removal has helped increase the abundance of redband trout in the Sanpoil River (this increase in abundance is also related to adjusting harvest regulations).
- There is no effective forum or program for controlling warmwater fish predation in the anadromous portion of the Columbia basin.

3. What types of programs have (or would have) the largest return on investment?

General:

- This may be unknown given questions around compensatory versus additive mortality for predation.
- Efforts to reduce overall predation will be the most effective when all sources of predation are addressed so there can be less compensation.
- Eliminate non-native forage species that maintain survival of both avian and piscine predators (e.g., shad removal).
- Actions that have the highest return on investment include those that manage predators lower in the system, have higher additive effects on prey, and affect a variety of salmonid runs.
- Reduce acute predation events.

Avian:

- Remove cormorants from the Astoria-Megler Bridge.

Marine Mammal/Pinniped:

- Pinniped removals have high benefit for local runs, but the coastwide benefits are minimal.

Piscine:

- Changes in hydropower management and environmental factors can reduce fish predation.
    - Restore natural flows/hydrology where possible.
    - Increase river turbidity to reduce predator foraging efficiencies.
    - Support reintroduction in blocked areas to increase overall abundance of salmon and steelhead in the entire system.
- Restore habitat at tributary river mouths and reduce piscine predation at the mouths of natal tributaries.
- Develop a program similar to the pikeminnow project directed at reducing predation by smallmouth bass, walleye, and channel catfish.
- Stagger hatchery release timing to alleviate predation pressure on wild fish (the Salish Sea Marine Survival Project is exploring this).
- Reduce light pollution from bridges (this light pollution allows increased predation during the night when smolts are typically more actively outmigrating).

4. **What resources exist currently? What programs need more resources? Are there resources out there that are not currently being tapped?**

General:

- Existing predator management program have seen reduced funding over the past years; increased funding would benefit all existing programs.
    - Salmon recovery fatigue may exist given few instances of reversing trends since species' listings.
    - BPA does not allow inflation adjustments, which has consistently reduced available funding for predator management programs.
- Science funding could be prioritized for salmon recovery.
    - Science education programs provide an opportunity to involve students in recovery actions.
- There is a potential opportunity to pursue funding designed to address coastal/marine resilience to climate change.
- Congressional appropriations may be necessary for a large-scale, holistic plan.
- Increasing involvement of tribal programs and communities can bring more results.
- Volunteers can be a significant source of support.

Avian:

- Predictability of funding is needed for avian predation monitoring programs.
- USACE Columbia River Fish Mitigation program funding has been decreasing each year, which has reduced available funding for avian predator management programs.

- Research dollars are needed to address longstanding uncertainties regarding avian predation (e.g., compensatory mortality, the interaction between hydropower management and the impacts of avian predators).

Marine Mammal/Pinniped:

- Authorizations for taking sea lion have been received but adequate implementation dollars have been slow to follow.

Piscine:

- Resources are extremely limited for warmwater fish predation work.
- Infrastructure funding could be used to retrofit structures associated with high predation.

5. What existing data, research, and studies are already out there that the group can use form recommendations? What data gaps exist?

Existing Information:

- Independent Scientific Advisory Board (ISAB) reports:
    - A review of predation impacts and management effectiveness for the Columbia River Basin (ISAB 2019).
    - Critical Uncertainties for the Columbia River Basin Fish and Wildlife Program (ISAB 2016).
    - Columbia River food webs: Developing a broader scientific foundation for fish and wildlife restoration (ISAB 2011).
- Avian Predation Synthesis Report (Roby et al. 2021) and subsequent annual reports from the researchers.
- Caspian tern, double-crested cormorant, and American white pelican population estimates are available.
- Annual reports on pinniped predation and management at Bonneville Dam (early 2000s-present; USACE, ODFW et al.) and Willamette Falls (2014-present; ODFW).
- BPA-funded northern pikeminnow program annual and synthesis reports.

Data Gaps:

- Placing PIT tag readers on predators to record rates of predation on hatchery salmon.
- Types and numbers of predators and when/where they are actively feeding.
- The relationship between predation and habitat characteristics (e.g., light pollution, large woody debris as refuges, effects of vegetation on predator access).
- Whether devices targeting the middle ear reflex in pinnipeds would be more effective than loud sounds.
- There are major data gaps related to additive versus compensatory mortality (particularly for avian predation).
- Avian predation on hatchery versus wild steelhead (missing predation rates on wild steelhead from the Upper Columbia).

- In-river pinniped predation downstream of pinch points like Bonneville Dam and Willamette Falls (e.g., see work by Michelle Rub).
- The impact of hatchery releases on predator abundance (masking versus attraction of predators and impacts on wild fish).
- Relationships between increments of flow and predator foraging success in the tributaries and the mainstem for different salmon and steelhead stocks.
- The impact of non-native piscivores on life-cycle survival (is it system-wide or population-specific?).
- The impact of American shad on native ecosystems.
- The influence of light pollution on predation (research in Lake Washington has shown increased predation at night due to light pollution).

Key Themes and Discussion Points:

- Many existing programs are not delivering the anticipated or desired outcomes in the long-term. The following challenges were identified:
    - Animals tend to habituate to deterrents, so interventions may be effective in the short-term but not in the long-term. Consistent and sustainable efforts are needed to be effective; predator populations will rebound if efforts are not maintained.
    - For avian predation, work group members noted that all existing programs have had some unintended consequences and none have achieved the desired results for fish, so overall results have been mixed.
- Regulatory and policy changes were necessary to improve efficacy of certain actions.
    - Amendments to the MMPA in 2018 improved increased effectiveness of lethal pinniped removals as a tool to reduce acute sources of predation by allowing states and tribes to target Steller sea lions.
- This work group should be thinking about actions holistically; actions can be taken that have multiple benefits or can be implemented in conjunction with other management activities.
- Actions in various geographies can have a significant return on investment.
    - Actions to reduce predation on steelhead in the lower Columbia Basin should have broader benefits across the basin.
    - Focused efforts in narrow portions of the Columbia Basin that address acute impacts could have significant outcomes.
- The Columbia River Basin is a highly altered system; reservoir environments are conducive to predators and juveniles spend a much greater amount of time before they are flushed out compared to before the dams which makes them more vulnerable to predation.
    - Addressing environmental factors and ecosystem functioning (e.g., lower water temperatures and increased flows) could have a positive impact.
- Consistent, long-term funding is a challenge.
    - All existing programs could benefit from increased funding. A long-term funding commitment is needed for these efforts to be successful.
- Working group members identified the following data gaps that hinder successful implementation of predator management programs:
    - There is a substantial data gap related to compensatory mortality (particularly related to avian predation). When you manage a predator, you manage a food web. We are

assuming that we understand what the effects of an action are going to be, but this is a highly contested topics and we don't know what the effects will be.
        - One way to address this is to conduct retrospective analysis to evaluate which management programs have worked and which haven't.
    - We are missing an understanding of basin-wide energetics to provide a complete picture of total losses and the relative impact of fish predation.
    - There is a gap related to the impact of hatchery releases on masking or attraction for wild salmonids.

Work Plan and Next Steps

Amira reviewed potential next steps for this work group based on the group's discussion and opened the discussion for work group members to contribute other actions that this group can take. The list of actions includes the following:

- Summarize existing programs and effectiveness.
- Survey the types of programs are most effective at reducing predation.
- Develop research/data collection requests.
- Develop budget requests.
- Identify actions that link the three types of predation in a way that is complementary to each other (take a holistic approach).
- Identify packages of actions that have a cumulative effect leading to salmon and steelhead population recovery; include actions beyond those which have the greatest return on investment.
- Identify opportunities for dual use funding which can bring new benefits to salmon rather than competing for existing funds.
- Identify opportunities to enhance existing programs and support long-term investment.

Amira confirmed immediate next steps and action items. The facilitation team will draft a work plan that will be reviewed by the work group members and the I/RG and follow up to schedule the second work group meeting in late October or early November. Amira thanked everyone for participating and adjourned the meeting.