



Summary of Stakeholder Workshop Pinniped Predation on Salmonids Committee

Prepared for the Washington Department of Fish and Wildlife

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Seattle, WA

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Workshop Overview

In response to a request from the Washington Department of Fish and Wildlife (WDFW), the Washington State Academy of Sciences (WSAS) convened a committee charged with reviewing the science regarding pinniped predation on salmonids in Washington's waters and coastal areas. Deliverables from the committee to WDFW will include a bibliography of pinniped predation research and a report that includes 1) what is known about pinniped predation of salmonids, and with what level of certainty, 2) where the knowledge gaps are, 3) where additional research is needed, 4) how the science may inform policymakers, and 5) an assessment of the scientific and technical aspects of policies and potential management actions within Washington. Notably, the committee's report to WDFW will not recommend specific management actions, but rather will summarize the science and current research on this issue. Early in this process, the committee conducted two workshops to engage members of the scientific community and stakeholders with expertise in pinniped predation to gather information on published and unpublished research and data to integrate into the bibliography and final report.

On March 14, 2022, the committee conducted a workshop with stakeholders to gather feedback on recommended areas of focus for the committee. The workshop served as a forum for stakeholders to share their knowledge and perspectives regarding pinniped predation on salmonids. Information shared during the workshop will inform the committee's bibliography and report to the state summarizing the current science around pinniped predation on salmonids, which will be delivered later this year. This document summarizes key points of the workshop discussions. The workshop agenda and list of participants are included as appendices.

Input by Topic

The workshop was structured according to three broad topics:

- Factors affecting pinniped predation on salmonid populations
- Ecological interactions of potential management actions
- Potential benefits, risks, and uncertainty associated with management actions

For each of these topics, the committee posed several discussion questions and opened the floor for comments. The sections below review the key takeaways from these discussions.

Factors Affecting Predation

The discussion questions for this topic were as follows:

- What characteristics of pinnipeds (e.g., number, age, location), salmonid populations, the natural environment, artificial structures, or anthropogenic activities promote an increased pinniped predation rate on salmonids?
- What is the best approach to determine if pinniped predation rates are either contributing to salmon population declines or preventing rebuilding populations to healthy harvestable levels?

- What are the key gaps in our understanding of pinniped predation rates on salmonids and factors affecting predation rates?

Fish Body Size and Age

A participant described an apparent relationship between predation and fish body size: larger fish are more appropriate prey items. As described by another participant, rates of predation on juvenile salmon may differ greatly from predation on adult salmonids.

Hatchery Release

Another factor that may influence pinniped predation on salmonids is the timing of the release of hatchery fish. One participant explained that hatchery Chinook used to be released into the Puget Sound over the course of 2 months, but that window has shrunk to about 2 weeks to reduce competition between wild and hatchery Chinook. This compressed time frame results in a large number of fish entering the system simultaneously. An abundance of juvenile salmonids exiting the hatchery simultaneously may convey an intense prey signal, leading to a significant predation effect. Disorientation among hatchery fish when they transition from freshwater to saltwater may also increase vulnerability.

Artificial Structures

Several participants stated that artificial structures increase vulnerability to predation, noting that salmonid migration through narrow areas or passageways partially blocked by structures may draw intense predation. Examples of structures that may impede migration include bridges, tide gates, and docks. One participant shared that pinnipeds may develop specialized foraging strategies based on the built environment once they learn that fish gather or pause at a certain structure.

Predation on Late Winter Chum

Another participant discussed data on late winter chum, which enter the Puget Sound during a different period from the bulk fall run. This timing makes these fish particularly vulnerable to predation due to limited alternative prey for pinnipeds. Data gathered by the Nisqually Tribe suggests that the age distribution within winter chum populations is shifting, likely due to predation.

Predation in Spawning Grounds

The Nisqually Tribe has observed pinnipeds encroaching on steelhead spawning grounds in the Nisqually River. Another study recently documented pinnipeds entering the spawning grounds in Lake Ozette. A participant remarked that pinniped predation extending to spawning grounds is a broad issue across multiple systems.

Loss of Habitat

One participant attributed shifts in predation patterns to historical losses of nearshore habitat, stating that changes in habitat could directly influence predation rates or indirectly alter predation rates as a result of changes in populations of alternative prey. As noted by another participant, the loss of nearshore habitat reduces life history diversity for salmon, which can increase the vulnerability of their

populations. Several participants agreed that the influence of habitat loss on pinniped predation and salmonid mortality warrants further research.

Indifference to Human Presence

Several participants reported that pinnipeds, especially those residing in areas where hunting is not permitted, appear to be conditioned to human presence and demonstrate no fear of humans. As an example, several people shared anecdotes of pinnipeds removing fish from fishing nets.

Ecological Interactions

The committee posed the following discussion questions around this topic:

- What evidence is there that reductions in pinniped populations result in increases in salmon populations?
- How do hatchery management practices affect potential management actions?
- What evidence is there that rebuilding populations of alternate pinniped prey (i.e., forage fish) would mitigate pinniped predation on salmonids?
- What evidence is there that reductions in pinniped populations would additionally benefit salmon populations by also reducing predation on herring?
- What evidence is there that reductions in pinniped populations would have the unintended negative effect of increasing predation on salmon by other species?

Alternative Prey

When salmonids are the only prey available, they are preyed upon more heavily. Thus, alternative prey play a key role in the severity of pinniped predation on salmonids. A participant pointed to pink salmon as having a buffer effect on the predation of Chinook salmon now that the pink salmon population is rebounding from overfishing.

Several participants discussed the ecological interactions between salmonids and hake. One attendee noted that in some areas, hake do not serve as alternative prey due to their tendency to remain in deep water. When hake biomass was at its peak, hake fed on juvenile herring. However, due to the reduction in hake size as a result of environmental factors, a participant reported that hake only rarely prey on salmonids now.

Other Predators

A participant highlighted the importance of considering other predators that previously had little impact on forage fish but are now increasing in population, such as humpback whales and porpoises. It is possible that this predation reduces forage fish populations, which can in turn alter predation on salmonids. These predators may also influence pinniped populations and behavior.

A study is currently in progress to assess the diet of humpback whales and determine whether they are contributing significantly to salmon mortality. Another current study aims to determine whether the increasing killer whale population is affecting the pinniped population. A participant pointed out that at a minimum, the presence of these predators appears to be altering pinniped behavior.

Potential Benefits, Risks, and Uncertainty of Management Actions

The discussion questions for this topic included the following:

- What are the key gaps in our understanding of pinniped predation to implement effective management actions?
- Is there evidence that it is feasible to break/interrupt socially transmitted predation behaviors by removing re-occurring pinniped predators?
- There are three administrative methods for a state agency to receive authorization to lethally remove pinnipeds from the NMFS. One of which, MMPA Section 120, requires that pinnipeds that are permitted to be removed are individually identifiable and documented to have consumed ESA-listed salmon. What recommendations are there for achieving that standard in a cost-effective manner in Puget Sound or the Outer Coast in areas where there are not dams (e.g., Bonneville) or concrete infrastructure (e.g., Ballard Locks) to view individually marked pinnipeds preying on salmonids? Is photo ID a viable tool to recognize individually identifiable pinnipeds, across years, for the purposes of MMPA 120 with and without capture and marking?

Monitoring

One participant highlighted the need to quantify the number of pinnipeds that are foraging in rivers and estuaries and the effect of this behavior on salmon populations. The participant added that continuous surveillance is needed to gather this information, rather than fragmented monitoring.

Management Approaches

There was some disagreement among participants on the effectiveness of culling as a management approach. One participant described how culling large numbers of pinnipeds was ineffective, as new pinnipeds would arrive to replace those that were culled. Another participant countered that culling must be selective and not conducted randomly.

Several participants discussed the management approach of reinstating the traditional marine mammal harvesting system within Indigenous communities. A participant shared that tribes have interest in resuming this traditional harvesting but are still seeking legal clarity on this issue.

One participant suggested an adaptive management approach that involves modeling predicted interactions, acting on those predictions, and adjusting the approach as needed.

Next Steps

Over the next several months, the committee will draft a bibliography and a report on the science of pinniped predation on salmonids, informed by the input gathered during this workshop and during a previous workshop with scientists and co-managers.

APPENDIX A: PARTICIPANT LIST

Role	First Name	Last Name	Affiliation
Committee	Alejandro	Acevedo-Gutierrez	Western Washington University
Committee	Mike	Etnier	Western Washington University
Committee	Tessa	Francis	University of Washington Tacoma
Committee	Daniel	Schindler	University of Washington
Committee	Jonathan	Scordino	Makah Tribe
Committee	Megan	Moore	NOAA Fisheries
Committee	Kathryn	Sobocinski	Western Washington University
Participant	Jeannie	Abbott	GSRO
Participant	Kwasi	Addae	Washington Dept of Fish & Wildlife
Participant	Mickey	Agha	Washington Department of Fish and Wildlife
Participant	Adrienne	Akmajian	Makah Tribe
Participant	Liz	Allyn	Makah Tribe
Participant	Molly	Alves	The Tulalip Tribes
Participant	Joe	Anderson	Washington Department of Fish and Wildlife
Participant	Robert	Anderson	National Marine Fisheries Service
Participant	Anthony	Battista	Skokomish Tribe
Participant	Barry	Berejikian	NOAA/NMFS/NWFSC/
Participant	Daryl	Boness	Marine Mammal Commission
Participant	Aaron	Brooks	Jamestown S'Klallam Tribe
Participant	Sarah	Brown	WDFW
Participant	Laurence	Bucklin	Puget Sound Anglers State Board
Participant	Mike	Burger	Muckleshoot Indian Tribe
Participant	Kathleen	Callaghy	Defenders of Wildlife
Participant	Renee	Chamberland	SR3
Participant	Dylan	Collins	The Tulalip Tribes
Participant	Kellen	Copeland	Oregon State University
Participant	John	Edwards	Washington Department of Fish and Wildlife
Participant	Tara	Galuska	GSRO
Participant	Ron	Garner	Puget Sound Anglers
Participant	Joseph	Gaydos	SeaDoc Society / UC Davis Wildlife Health Center
Participant	Deborah	Giles	Wild Orca
Participant	Erin	Gless	Pacific Whale Watch Association
Participant	Cecilia	Gobin	Northwest Indian Fisheries Commission
Participant	Michael	Gosliner	Marine Mammal Commission
Participant	Cynthia	Gray	Skokomish Tribe
Participant	Frances	Gulland	Marine Mammal Commission

Participant	Lucas	Hall	Long Live the Kings
Participant	Robert	Harris	University of St Andrews
Participant	Dennis	Heinemann	Marine Mammal Commission
Participant	Diego	Holmgren	The Tulalip Tribes
Participant	Rob	Jones	Northwest Indian Fisheries Commission
Participant	Katie	Krueger	Quileute Tribe (Natural Resources Dept.)
Participant	Kessina	Lee	Washington Department of Fish and Wildlife
Participant	Zoe	Lewis	Western Washington University
Participant	David	Low	WDFW
Participant	Derek	Marks	Tulalip Tribes
Participant	Robert	McClure	Upper Skagit Indian Tribe
Participant	Mike	McHenry	Lower Elwha Klallam Tribe
Participant	Iain	Mckechnie	uvic
Participant	Casey	Mclean	SR3 Sealife Response, Rehabilitation and Research
Participant	Jed	Moore	Nisqually Indian Tribe - Salmon Recovery Program
Participant	Gary	Morishima	QMC
Participant	Mary	Neil	Muckleshoot
Participant	Kurt	Nelson	Tulalip Tribes
Participant	Mark	Nelson	Lummi
Participant	Whitney	Neugebauer	Whale Scout
Participant	Kari	Neumeyer	NWIFC
Participant	Nora	Nickum	Seattle Aquarium
Participant	Peter	Olesiuk	Pacific Eco-Tech Environmental Research
Participant	Tony	Orr	Marine Mammal Laboratory/NOAA
Participant	Rich	Osborne	UW Olympic Natural Resource Center
Participant	Nate	Pamplin	Washington Department of Fish and Wildlife
Participant	Christine	Parker-Graham	US Fish and Wildlife Service
Participant	Scott	Pearson	WDFW
Participant	Joseph	Peters	Squaxin Island Tribe
Participant	James	Powell	SR3
Participant	Michelle	Rivard	The Marine Mammal Center
Participant	Gordon	Rose	Northwest Indian Fisheries Commission
Participant	Naomi	Rose	Animal Welfare Institute
Participant	Michelle	Rub	NOAA NWFSC
Participant	Casey	Ruff	Swinomish Tribe
Participant	Casey	Schmidt	Suquamish Tribe
Participant	Joe	Scordino	retired NOAA Fisheries
Participant	Alyssa	Scott	The Whale Museum
Participant	Monika	Shields	Orca Behavior Institute

Participant	Craig	Smith	Nisqually Indian Tribe
Participant	Stephen	St. Pierre	Marine Mammal Alliance Nantucket Stranding Team
Participant	Kevin	Swager	Skokomish Tribe
Participant	Joseph	Taylor	Simon Fraser University
Participant	Stephanie	Thurner	NWIFC
Participant	Amy	Trainer	Swinomish Indian Tribal Community
Participant	David	Troutt	Nisqually Indian Tribe
Participant	Frank	Urabeck	Steelhead Trout Club of Washington
Participant	Lauren	Urgenson	King County
Participant	Carl	Walters	UBC
Participant	Kenneth	Warheit	WDFW
Participant	Colleen	Weiler	Whale and Dolphin Conservation
Participant	Laurie	Weitkamp	NOAA Fisheries/NWFSC
Participant	Jacques	White	Long Live the Kings
Participant	Eric	Winther	WDFW
Participant	Jamie	Womble	National Park Service
Participant	Bryan	Wright	Oregon Department of Fish and Wildlife
Participant	Mara	Zimmerman	Coast Salmon Partnership
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APPENDIX B: WORKSHOP AGENDA

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AGENDA – STAKEHOLDER WORKSHOP
PINNIPED PREDATION ON SALMONIDS STUDY

MARCH 14, 2022 | 1:00 – 4:00 PM PT

The Washington State Academy of Sciences (WSAS) study committee on Pinniped Predation on Salmonids is hosting a virtual stakeholder workshop on **March 14, 2022, 1pm-4pm PT**. The focus of the workshop will be the science of pinniped predation on salmonids, with an emphasis on Washington's portion of the Salish Sea and Washington's outer coast.

The intent of this workshop is to provide an opportunity for stakeholders to engage with the WSAS committee and invite stakeholders to share key context, relevant research, and additional perspectives with the committee. Thus, **we welcome your public comments during the event**. The information gathered at the workshop and in writing will inform the study committee's summary of the science of pinniped predation on salmonids. More information about the committee is at: <https://washacad.org/portfolio-items/pinniped-predation/>

We invite you to submit written information, literature, resources, or comments for use by the committee in the following form: https://wsu.co1.qualtrics.com/jfe/form/SV_0HgpqvQXcEjUdsW Regardless of participation in the workshop, all written comments will be shared with the committee.

1:00 pm **Opening and introduction to the project and workshop objectives;** *Daniel Schindler (Committee Chair)*

Overview from WDFW; *Jessica Stocking (Marine Species Lead Biologist, WDFW Wildlife Diversity)*

Workshop logistics; *Amanda Koltz (WSAS)*

1:05 pm **Session 1: Factors affecting predation**
Moderators: *Kathryn Sobocinski, Alejandro Acevedo-Gutierrez*

Open discussion. Points of particular interest:

- What characteristics of pinnipeds (e.g., number, age, location), salmonid populations, the natural environment, artificial structures, or anthropogenic activities promote an increased pinniped predation rate on salmonids?
- What is the best approach to determine if pinniped predation rates are either contributing to salmon population declines or preventing rebuilding populations to healthy harvestable levels?
- What are the key gaps in our understanding of pinniped predation rates on salmonids and factors affecting predation rates?

- 2:00 pm *Break*
- 2:10 pm **Session 2: Ecological interactions of potential management actions**
Moderators: *Megan Moore, Tessa Francis*
- Open discussion. Points of particular interest:
- What evidence is there that reductions in pinniped populations result in increases in salmon populations?
 - How do hatchery management practices affect potential management actions?
 - What evidence is there that rebuilding populations of alternate pinniped prey (i.e., forage fish) would mitigate pinniped predation on salmonids?
 - What evidence is there that reductions in pinniped populations would additionally benefit salmon populations by also reducing predation on herring?
 - What evidence is there that reductions in pinniped populations would have the unintended negative effect of increasing predation on salmon by other species?
- 3:00 pm *Break*
- 3:10 pm **Session 3: Potential benefits, risks, and uncertainty associated with management actions**
Moderators: *Jonathan Scordino, Mike Etnier*
- Open discussion. Points of particular interest:
- What are the key gaps in our understanding of pinniped predation to implement effective management actions?
 - Is there evidence that it is feasible to break/interrupt socially-transmitted predation behaviors by removing re-occurring pinniped predators?
 - There are three administrative methods for a state agency to receive authorization to lethally remove pinnipeds from the NMFS. One of which, MMPA Section 120, requires that pinnipeds that are permitted to be removed are individually identifiable and documented to have consumed ESA-listed salmon. What recommendations are there for achieving that standard in a cost-effective manner in Puget Sound or the Outer Coast in areas where there are not dams (e.g., Bonneville) or concrete infrastructure (e.g., Ballard Locks) to view individually marked pinnipeds preying on salmonids? Is photo ID a viable tool to recognize individually identifiable pinnipeds, across years, for the purposes of MMPA 120 with and without capture and marking?
- 3:55 pm **Summary and Wrap-Up;** *Daniel Schindler*
- 4:00 pm **Adjourn**