

2018



Southern Resident Orca Task Force

Report and recommendations
November 16, 2018

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Co-chair letter of transmittal

Governor Jay Inslee
Office of the Governor
Olympia, WA 98504

Dear Gov. Inslee,

Thank you for the opportunity to serve on behalf of the Southern Resident orcas, fellow creatures that are deeply meaningful to us and critically important to the well-being of Washington's marine ecosystem. Thank you, too, for your leadership in establishing the Southern Resident Orca Task Force. As co-chairs of the task force, we are submitting an ambitious package of science-based recommendations for your consideration. If enacted, these recommendations will make significant progress toward recovering our Southern Residents.

In 2018, we tragically lost three Southern Residents — Crewser (L92), Scarlet (J50) and the newborn calf of Tahlequah (J35) — bringing the number of Southern Residents to just 74. Perhaps the most heart-wrenching was that of J35's calf. The world watched as Tahlequah swam 1,000 miles with her dead calf, supported by her J-pod family, finally letting the body go after a 17-day vigil. We all grieved, and collectively realized our kinship with these highly sophisticated and emotionally intelligent mammals.

This fall, we learned that there is at least one pregnant female in each of the Southern Residents pods. This good news offers hope for the future while underscoring the need to take action immediately to give them the best chance of survival.

From the start, our goal has been to do what is best for the Southern Residents and recommend actions that are feasible, that will improve conditions in the short run while providing the basis for long-term recovery, and that draw on contributions from all. Through our deliberations, we have learned that there are no quick and easy fixes and that successful recovery will require comprehensive, collective action by all of us.

We are pleased to report that this package represents a consensus of and is supported by an overwhelming majority of the task force, with minority opinions provided where differences exist on specific actions. We believe that implementing these recommendations will lead to an increase in Chinook salmon from Puget Sound, the Columbia River and the Washington coast to provide the food that the Southern Residents desperately need. Toxic contaminants will be reduced, improving salmon and orca health and survival. And vessel noise and other disturbances will be lessened, improving the orcas' ability to forage and communicate.

Success in this endeavor will require significant investment from the state and our many regional partners as well as legislation to enact recommended policies into law. We look forward to working with your administration and the Legislature to secure these resources and outcomes. In Year Two, the task force will monitor progress on implementation and orca health and address other pressing

issues such as the impacts of climate change and human population growth on the Southern Residents.

We wish to thank members of the task force, who all contributed their expertise and time and earnestly worked through their differences to come to agreement on this package. We particularly appreciate the participation of tribal leaders, who as representatives of their sovereign nations joined in our discussions and contributed their spirit and wisdom. We also wish to express our deepest gratitude to the members of our three working groups, who contributed their knowledge, scientific expertise and countless hours to identify and analyze the myriad options to address threats to Southern Residents and put forward recommendations for task force discussion. We could not have done this work without all of them.

Finally, we wish to express our heartfelt appreciation for the many members of the public who care so deeply about the Southern Residents and who fervently asked that we get this right and commit to the actions necessary to protect the orcas. We received over 18,000 written public comments and were personally moved by the presence and words of the hundreds of individuals who attended and spoke at our meetings. Their passion and concern inspired all of us to redouble our efforts to find consensus on actions that can truly make a difference for our Southern Resident orcas.

Sincerely,

Les Purce and Stephanie Solien



Executive summary

Executive order

On March 14, 2018, Gov. Jay Inslee signed Executive Order 18-02: Southern Resident Killer Whale Recovery and Task Force. Through this executive order, the governor directed state agencies to implement nine immediate actions to benefit Southern Resident killer whales (hereafter in this report “Southern Resident orcas”). He also established the Southern Resident Orca Task Force to identify, prioritize and support the implementation of a long-term action plan for the recovery of Southern Resident orcas to ensure a healthy and sustained population for the future. The new task force had nearly 50 representatives from diverse sectors, including tribal, federal, local and other state governments, state agencies, the Washington State Legislature, the private sector, nonprofit organizations and the Government of Canada. The governor charged the task force with preparing this comprehensive report which identifies needed policies and programs, recommends priority actions to support recovery efforts, highlights budget needs and recommends legislation necessary to support the recovery of Southern Resident orcas. The task force will continue its work in 2019 and produce a second report by October that will outline progress made, lessons learned and outstanding needs.

Urgency

The Southern Resident orca population travels in pods from central Southeast Alaska to central California, spending most of the year in the Salish Sea near the San Juan Islands, on the outer coast of Washington and along the outer coast of southern Vancouver Island. The Southern Resident orca was classified as endangered in Canada under the Species at Risk Act in 2003 and in the United States under the federal Endangered Species Act in 2005. Washington state classified orcas as endangered in 2004.

Since Executive Order 18-02 was signed, the population of Southern Resident orcas has dropped to 74, the lowest number in more than 30 years. The orcas are struggling to find food and raise calves.

None of the Southern Resident calves born between 2015 and 2018 has survived. In 2018, tragedies in the Southern Resident population put an even brighter spotlight on the need for urgent and effective action. Tahlequah, or J35, carried her deceased newborn for 17 days in late July and early August more than 1,000 miles in what was widely seen as a display of deep mourning. Three-year-old Scarlet, or J50, was presumed dead in September after showing signs of severe emaciation.

The extinction of these orcas would be an unacceptable loss. These orcas are beloved and hold significant value as an iconic and treasured species in Washington and throughout the Pacific Northwest, particularly for tribal communities. They also serve as an indicator of the health of our waters. Action is required immediately to help the orcas and the entire ecosystem we depend upon.

The task force's ultimate goal is to ensure a healthy and resilient ecosystem that supports a thriving Southern Resident orca population and prevents its extinction.

Key threats

The task force focused on the three major threats to Southern Resident orcas identified in the 2005 listing under the Endangered Species Act and in Gov. Inslee's executive order:

- **Lack of prey.** The Southern Resident orca diet is composed primarily of Chinook salmon. Several runs of Chinook salmon that could provide important prey for Southern Resident orcas are listed as threatened or endangered under the Endangered Species Act. To be abundant, diverse and sustainable, Chinook need productive and protected habitat as well as a reliable supply of forage fish to feed on. Development activities and fish passage barriers such as impassable dams, tide gates and culverts have led to habitat loss for both salmon and forage fish. Predators such as sea lions, harbor seals, fish and birds consume Chinook and reduce the number available to the orcas where their foraging areas overlap. Salmon harvesting in fisheries in Alaska, British Columbia, off Washington's coast or in Washington's inland waters can further reduce the number of Chinook available for the orcas. Hatchery production could play an important role in increasing prey abundance for Southern Residents but also poses genetic and ecological risks to wild populations if not managed carefully. Addressing lack of prey therefore requires addressing all these issues: habitat, forage fish, hydropower, predation, harvest and hatcheries.
- **Disturbance from noise and vessel traffic.** Vessels transiting near Southern Resident orcas can produce underwater noise that masks or impairs orca communication and echolocation (the method orcas use to find their prey). This makes it harder for orcas to find food and reduces the time orcas devote to foraging by almost 20 percent, reducing their potential prey intake and increasing their energy expenditure.
- **Toxic contaminants.** Southern Residents and their prey are exposed to an ever-increasing mixture of pollutants in the marine environment, particularly in the Salish Sea. Many of the pollutants are poorly metabolized, persist in the environment and bioaccumulate and bio-magnify in the food web. These toxics can reduce salmon survival by making them more

susceptible to disease, which in turn means less food is available to the orcas. The toxic contaminants can also reduce immunity and cause reproductive disruption in orcas.

In addition to these three key threats, climate change and ocean acidification are overarching threats that will exacerbate current stresses on the Southern Residents, primarily through the food web as warmer stream and ocean temperatures, lower summer stream flows, heavier winter rainstorms and sea-level rise impact salmon, forage fish and the entire ecosystem that orcas rely upon.

Process

The task force held six meetings from May through November 2018 throughout the state of Washington. Working groups composed of relevant subject matter experts and stakeholders supported the task force throughout the process using the best available science to identify, research and analyze potential actions. The 18,000 comments received from the public were also a key element informing this process and task force decisions.

Recommendations

The task force focused on developing a package of recommendations that, if implemented, would collectively have the impact needed to achieve the vision of a thriving and resilient Southern Resident orca population.

The recommendations support four goals:

- **Goal 1:** Increase Chinook abundance.
- **Goal 2:** Decrease disturbance of and risk to Southern Resident orcas from vessels and noise, and increase their access to prey.
- **Goal 3:** Reduce the exposure of Southern Resident orcas and their prey to contaminants.
- **Goal 4:** Ensure that funding, information and accountability mechanisms are in place to support effective implementation.

Recommendations and associated implementation details are described in the report.



Vision

We envision a thriving and resilient population of Southern Resident orcas, living in healthy waters and inspiring our descendants with their majesty.

Goals

Our ultimate goal is to ensure a healthy and resilient ecosystem that supports a thriving Southern Resident orca population. We seek to protect the Southern Resident orcas from extinction.

We align ourselves with the [Recovery Plan for Southern Resident Killer Whales \(*Orcinus orca*\)](#) prepared by the National Marine Fisheries Service (2008) and its goal of an average population growth rate of 2.3 percent per year for 28 years.

Between now and 2022, our goal is to witness evidence of consistently well-nourished whales, more live births and the survival of several thriving young orcas. By 2028, our goals are to see the primary indicator of body condition of the whales (the ratio of head width to body length in adults) remain high and stable between seasons and across years and to see an increase in the population to 84 whales (10 more whales in 10 years).

To achieve our goals, we commit to:

- Restoring sustainable, harvestable Chinook populations in healthy habitats across Washington state, supporting and accelerating implementation of the federally approved salmon recovery plans.
- Reducing the impacts of vessel noise and disturbance so the Southern Residents can effectively forage, rest and socialize.
- Reducing the toxicity of the ecosystem to improve the health of whales and their prey.
- Using the best available science to develop and implement a plan to realize our vision.

Introduction

Executive order

On March 14, 2018, Gov. Jay Inslee signed Executive Order 18-02: Southern Resident Killer Whale Recovery and Task Force (see Appendix 1 for the full text). Through this executive order, the governor directed state agencies to implement nine immediate actions to benefit Southern Resident orcas (refer to the “Ongoing and Immediate Actions” section of this report for details). He also established the Southern Resident Orca Task Force to identify, prioritize and support the implementation of a longer-term action plan for the recovery of Southern Resident orcas so that Washington has a healthy and sustained population of Southern Residents in the future.

The governor charged the task force with preparing a comprehensive report with recommendations for recovering Southern Resident orcas. The executive order outlines prey abundance, toxic contaminants and disturbance from noise and vessel traffic as the major threats that must be addressed. The governor directed the task force to identify needed policies and programs, recommend priority actions to support recovery efforts, highlight budget needs and recommend any legislation necessary to support the executive order. To inform the development of legislative and budget proposals for the 2019–21 biennium, the governor directed the task force to submit its first comprehensive report and recommendations for recovering Southern Residents by November 2018 and a second report by October 2019. The second report will outline progress made, lessons learned and outstanding needs.

The range of the Southern Residents

The Southern Resident orca population is composed of the J, K and L pods. Travelling in these pods of extended family members, orcas range from central Southeast Alaska to central California but spend most of the year in the Salish Sea near the San Juan Islands, on the outer coast of Washington and the outer coast of southern Vancouver Island. In pursuit of migrating salmon, Southern Residents are known to forage farther south in Puget Sound during the fall and spend time near the Columbia River mouth in winter [1].

The task force recognizes that U.S. and Canadian marine waters and Chinook from Canadian rivers are important for the health and recovery of the Southern Resident orcas and recommends that Washington continue to work cooperatively with Canada on transboundary efforts to improve conditions related to prey, contaminants and vessel disturbance. It will also be important to work with other states and across all levels of government within the U.S. to address the threats to the Southern Residents.

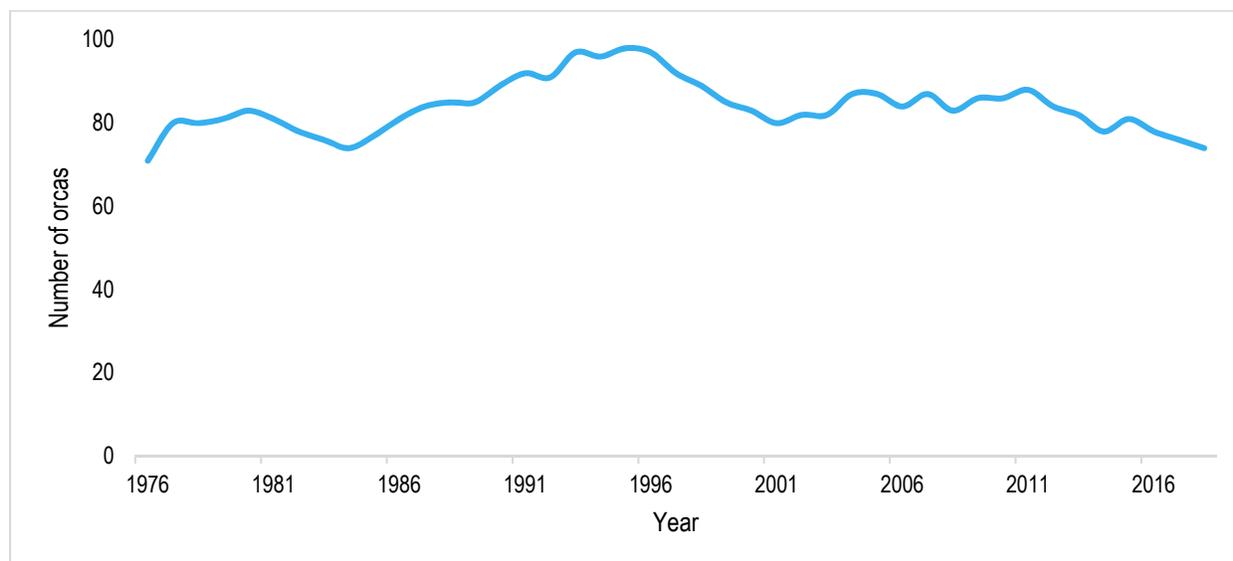


Urgency

The first Southern Resident orca population census in 1973 identified 66 orcas. It included reductions due to captures for marine parks between 1965 and 1975. As shown in Figure 1, since 1975 the population has experienced periods of growth, and in 1995 increased to a high of 98 orcas. However, between 1995 and 2003, the population dropped by 16 percent, down to 82 orcas, which prompted their listing as an endangered species [2]. Southern Resident orcas were classified as endangered in the United States under the federal Endangered Species Act in 2005 and in Canada under the Species at Risk Act in 2003. Washington state classified orcas as endangered in 2004. In response, the National Marine Fisheries Service Northwest Regional Office prepared the 2008 [Recovery Plan for Southern Resident Killer Whales](#). The plan details and analyzes potential threats affecting Southern Residents and outlines an adaptive management approach to recovery strategies addressing each threat, based on the best available science.

Since Executive Order 18-02 was signed in March of 2018, the population of Southern Resident orcas has dropped to 74, the lowest number in more than 30 years. Experts believe that, overall, the orcas are in poor condition and struggling to raise calves. In a study published in 2018, researchers from the Center for Conservation Biology at the University of Washington, the National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center and the Center for Whale Research noted that up to two-thirds of Southern Resident orca pregnancies from 2007 to 2014 failed [3]. In addition, none of the Southern Resident calves born between 2015 and 2018 has survived. In the past two decades, there have also been more male calves than female calves, raising concerns about the population's reproductive potential even when the calves survive [4].

Figure 1: Southern Resident orca population trend [5]



As the task force convened in 2018, tragedies in the Southern Resident population put a spotlight on the urgency of taking effective action. Crewser, or L92, was not with his pod when it returned to Puget Sound in June and was presumed dead. Tahlequah, or J35, had a calf that lived for only a half hour; she carried her newborn for 17 days more than 1,000 miles in what was widely seen as a display of deep mourning. Three-year-old Scarlet, or J50, was presumed dead in September 2018 after showing signs of severe emaciation; the National Oceanic and Atmospheric Administration, tribes and other partners had worked to diagnose and treat her but were unsuccessful. Despite best efforts, the underlying cause for her condition was never identified. In the fall of 2018, scientists noted that there was at least one pregnant female in each of the three Southern Resident pods. It will be critical that they get the food they need to bring those pregnancies to term and ensure the calves are strong enough to survive.

The extinction of these orcas would be an unacceptable loss. They are an essential component of our broader marine ecosystem, serving as an indicator of the health of our waters. If these creatures — the mammals who inhabit the top of the food chain — are unable to survive, it portends trouble for the rest of the inhabitants of this region. Their extinction would also be an irreplaceable cultural loss as these orcas are beloved and hold significant value as an iconic and treasured species in Washington and throughout the Pacific Northwest. The orcas have vital cultural and spiritual importance to many sovereign tribal nations. Inaction is not an option. Swift and bold near-term actions and effective long-term actions are urgently needed to not only help secure a healthy and sustained Southern Resident orca population, but also the entire ecosystem we depend upon. The overarching threat of climate change only adds to the urgency. Action to recover the Southern Residents must be taken at all levels across boundaries and including governments and individuals throughout the region.

Process

This section describes the process undertaken to create the task force and ensure that it had the support, information and public input needed to develop recommendations to the governor.

Creation of the task force

The governor invited members of the Legislature and the Government of Canada and representatives from tribal, federal, local and other state governments, state agencies, the private sector and the nonprofit sector to participate in the task force (refer to Appendix 2 for a full list of task force members). The task force held six meetings from May through November 2018 throughout the state of Washington in Olympia, Wenatchee, Anacortes, Tacoma and Puyallup.

Through these meetings, the task force worked toward three goals outlined in the executive order:

- Monitor and evaluate the immediate actions undertaken by state agencies and build upon the progress and effectiveness of that work.
- Identify, prioritize and support the implementation of a longer-term action plan needed for the recovery of Southern Resident orcas.
- Where available and applicable, build upon state, tribal, regional and federal salmon and orca recovery plans.

Working groups

To help the task force complete its work, the task force established three working groups. The Prey, Vessels and Contaminants working groups were composed of relevant subject matter experts and stakeholders. Each working group had 20–35 members and one to two state agency leads (refer to Appendix 2 for a full list of working group members). The working groups supported the task force using the best available science and personal knowledge or experience to identify, research and analyze potential actions and formulate recommendations for task force consideration. Each working group met one to two times per month from May through November 2018 at several different locations throughout the state, including Ridgefield, Tacoma, Olympia, Ellensburg and Seattle, and sometimes by phone.

Working groups developed lists of potential actions for task force deliberation and analyzed those potential actions using considerations such as:

- Effectiveness in improving Southern Resident orca survival and/or ability to reproduce.
- Timeline for benefits to Southern Residents once the action is implemented. Rating options were “immediate” (zero to three years), “intermediate” (three to 10 years) and “long term” (more than 10 years).
- Ease of implementation, including technical, political/social and regulatory feasibility, and the degree to which it reinforces or leverages current efforts.

- Estimated cost to implement. Actions were rated “high” for affordability if they cost less than \$30 million, “medium” if the estimated cost was \$30 million to \$100 million and “low” if the estimated cost was more than \$100 million.

Working groups also provided additional information related to:

- Social/cultural, community and environmental costs and benefits of actions.
- Climate change considerations.
- Potential ways to ameliorate any negative impacts and equity concerns.
- Where and when to implement each action.
- Links to current programs.
- Current and potential funding sources.

These details were provided to task force members to inform their decisions. The task force responded to the working groups with questions, feedback, new action ideas and requests for wording changes. The working groups used task force inputs to refine the draft list of recommendations. The task force then deliberated and made final decisions during its final meeting of 2018.

Steering committee

In addition to the working groups, the task force was supported by a steering committee charged with ensuring and enabling a smooth and effective process that meets the goals and timeliness of the governor’s executive order. The steering committee consists of the task force co-chairs and representatives of the Governor’s Office, Office of Financial Management, Department of Fish and Wildlife, Puget Sound Partnership, Department of Ecology and the Recreation and Conservation Office, which houses the Governor’s Salmon Recovery Office.

Information

Five webinars were conducted in 2018 to educate task force members — many at their request — on issues where they felt they needed more information to make well-informed decisions, including topics emphasized in public comments. The public was invited to attend these webinars, with topics covering climate change and ocean acidification, the Lower Snake River dams, spill over the Columbia and Snake River dams, the relative importance of the different threats to the Southern Resident orcas and the economic value of Southern Resident orcas. Peer-reviewed journal articles, briefing memos and discussion guides also provided task force members with background on issues they may not have been deeply familiar with at the outset.

Communication

Individual actions taken by members of the public will be a critical part of recovering the Southern Residents. Public awareness is therefore essential. The executive order mandated that the Puget Sound Partnership, the Department of Fish and Wildlife, the Department of Licensing, State Parks and Recreation Commission and the Governor's Salmon Recovery Office collaborate with the Governor's Office to inform and educate the public. These agencies also agreed to provide public outreach in support of the task force public process. Communication staff from the Department of Ecology and the National Oceanic and Atmospheric Administration volunteered to participate in the public outreach effort as well. Communication directors from the agencies named in the executive order and from NOAA West Coast Fisheries have been meeting twice monthly with the governor's communication staff to align communication efforts and support the communication needs of the task force co-chairs.

This interagency communications group developed a collaborative communications plan to help guide and shape collective communication efforts. Much of the initial outreach focused on social media and websites. The interagency communications group also undertook two event-specific campaigns. At the request of the task force co-chairs, the group collaboratively developed educational flyers to raise awareness among boaters about behaviors that help protect the orcas. The flyers were distributed at ports and marinas throughout Puget Sound and on Washington State ferries. In October 2018, the group worked with the Puget Sound conservation districts to amplify Orca Recovery Day events, helping to promote the day to the media, agency staff and partners, as well as to the public.

This group also meets periodically with nongovernmental communicators who are interested in helping to educate and inform the public about Southern Resident orcas. The purpose of these meetings is to:

- Identify resource-sharing opportunities.
- Exchange ideas and insights.
- Request sharing of communication initiatives and resources.
- Develop strategies for funding communication campaigns.
- Collaboratively develop and implement communication campaigns.

Continued communication will help to ensure broad support for implementation of task force recommendations as well as an understanding of the science and rationale behind the recommendations and who is most affected by the actions.

Public comment

Along with a review of the best available science and input from experts, public input is a key element informing this process and task force decisions. Oral and written public comments were accepted throughout the first year of task force work and public comment was heard at all task force meetings. As interest in the task force and the urgency of orca recovery efforts grew, public attendance at task force meetings increased. The task force moved to larger venues and adjusted its agendas, extending the length of its meetings and the time allocated for public comment.

Written public comments were also accepted via the comment portal on the governor's [Southern Resident Killer Whale Recovery and Task Force website](#). Individuals and organizations submitted more than 18,000 written comments to the task force between May and November 2018 (refer to Appendix 6 for detail). Members of the public expressed their concerns and ideas on a wide range of issues, including salmon recovery, habitat restoration, salmon harvest, boating restrictions and the removal of the Lower Snake River dams. Special public comment surveys were also set up to gather public feedback on the draft report and recommendations. Public comment will continue to be accepted through the end of the task force process in late 2019.



Key threats

The task force focused on three major threats to Southern Resident orcas identified in the 2005 Endangered Species Act listing and Gov. Inslee's executive order: lack of prey, disturbance from noise and vessel traffic and toxic contaminants. Each of these threats is summarized in turn below.

In addition, it is important to recognize the direct contribution of rapid population growth as an increasing threat to the state's natural environment. In 1950 the population of Washington state was approximately 2.38 million. Today it is 7.43 million and by 2040 it is expected to reach 9.24 million people [6]. The growth of Washington, neighboring states and Canadian provinces will continue to magnify threats to Southern Resident orcas.

Climate change is another overarching threat that exacerbates other risks to Southern Resident orcas and, if not addressed swiftly and effectively, could undermine recovery efforts for orcas and our marine ecosystem. Additional detail on climate change impacts to orcas and their prey is provided at the end of this section.

Prey

The Southern Resident diet is composed almost entirely of salmon, with adult male orcas needing approximately 325 pounds of Chinook to meet their daily prey energy requirements.¹ Although their diet tends to vary slightly throughout the year, feeding on smaller amounts of salmon species such as coho, chum and steelhead, about 80 percent of their total diet comes from Chinook salmon [7]. Although Chinook are dense in calories and the largest of the Pacific salmon species, they are also the least abundant and many populations are experiencing long-term reductions in size [1]. Several runs of Chinook salmon are listed as threatened or endangered under the Endangered Species Act. In addition, recent studies have shown that wild and hatchery Chinook are becoming smaller throughout most of the Pacific coast [8].

The abundance of salmon declined significantly in the late 1800s and early 1900s when techniques to harvest salmon became very effective. Low abundance was compounded by the effects of logging, agriculture, passage barriers, human development and water withdrawal. These activities reduced the number of salmon so significantly that hatcheries were constructed to artificially produce salmon to the levels the natural environment historically produced. Today, native and nonnative salmon-eating predators that benefit from artificial habitats can also have significant negative effects on local salmon populations. In addition, several forage fish stocks, which are critical prey for both juvenile and adult Chinook and serve as a buffer from salmon predators, have diminished in recent years [9, 10, 11].

¹ This estimate is based on maximum daily prey energy requirements for adult male orcas of 269,458 kcal/day [157], total energy per Chinook of 13,409 kcal/fish, and average mass of Fraser River Chinook of 8,655g [158].

Efforts to restore salmon populations are done in an integrated manner, commonly referred to as an all-H approach (habitat, hatcheries, hydropower and harvest). The Prey working group and task force also considered predation and forage fish in its efforts to explore actions to increase abundance of prey for Southern Resident orcas. Reversing the decline of salmon and improving their status will require commitment, sacrifice, significant investments and time. Immediate actions to increase salmon for orcas are necessary but should also be viewed in the context of longer-term salmon recovery. Successfully increasing prey abundance to the sustainable levels needed for Southern Resident and salmon recovery will require adequately considering and addressing all these factors, described in more detail below.

When salmon and steelhead were listed under the Endangered Species Act, the state of Washington developed a statewide strategy – Extinction is not an Option – that Gov. Locke and the Legislature approved in 1999. The strategy called for creation of an effective network of organizations and governments committed to recovering salmon and steelhead and the habitats upon which they depend.

To meet the needs of people and salmon across the state, recovery was organized by seven salmon recovery regions. The recovery organizations in each of those regions wrote and are now coordinating the implementation of federally approved salmon recovery plans. The organizations are directed by county, city, tribal and citizen representatives and advised by state and federal agency scientists. Regional organizations fill many salmon recovery needs but noteworthy is their resiliency, durability and credibility spanning local, state, tribal and federal governments over the last nearly 20 years in the face of the significant challenges that they and our salmon face. It is an unprecedented, locally led, statewide approach to recover endangered species.

State, regional and federal funding sources have provided significant project funding, but the amount has been only about 15 percent of what is needed to implement those plans. These organizations know what needs to be done to recover salmon and they have developed partnerships to make it happen. As challenges mount, including those related to the survival of the Southern Resident orcas that are so dependent upon the salmon we are working to save, we must ensure that the government's commitment is equal to the commitment of its citizens [12].

Habitat

Productive and protected habitat is critical for naturally spawning salmon to be abundant, diverse and sustainable. Adequate and functional habitat is also essential for supporting young hatchery salmon. Threats to healthy salmon habitat include:

- **Development.** As the human population grows, land use policies that allow development in or near floodplains and along shorelines can lead to degradation and loss of functioning habitat necessary to support salmon. Habitat is directly lost through the conversion of habitat to homes, buildings or other structures. Habitat is indirectly lost through non-point impacts from contaminated stormwater, groundwater withdrawal and alteration in stream flow due to water running off of impervious surfaces quickly, as opposed to infiltrating

slowly through the soil. Structures built to protect or support development such as dikes, bridges, bulkheads, culverts and stormwater systems often further impact salmon habitat. In particular, docks and shoreline armoring lead to destruction of important juvenile salmonid migratory corridors and nearshore forage fish spawning habitat.

- **Habitat loss and degradation.** In addition to effects of urbanization, transportation, agriculture, logging, mining and other forms of land use, many rivers have been straightened, diked and cleared of complex habitat features. Converting natural habitats into lands and rivers that support human uses often degrades the health of the habitat and the salmon that depend upon it.
- **Fish passage barriers.** Human-made barriers such as culverts, dams, bridges, fords, levees, erosion control structures, tide gates, flumes and pipeline crossings limit a salmon's ability to swim upstream into cool, productive spawning and rearing habitat [13]. Structures that impound water, divert water under a road or into a pipe or canal, or otherwise alter the natural flow of water (river or tidal zone) can negatively affect streambed movement and large wood movement, prevent fish from moving up or downstream, concentrate predators, impact water temperature and have a whole suite of other effects to natural ecological functions. In some cases, the effects associated with barriers can be as impactful as the barrier itself.
- **Water withdrawals.** Water withdrawals can reduce the amount of useable habitat for salmon. In addition, unscreened withdrawal points can trap small wild salmon in the conveyance structures that pump water from its source to its final destination.
- **Marine water quality.** Water quality is an essential component of functioning ecosystems that support the complex food web orcas depend upon. Emerging science shows reduced dissolved oxygen levels in Puget Sound caused by excess nitrogen in stormwater runoff could be negatively affecting the food web. Stormwater runoff is addressed in more detail in the "Contaminants" section of this report.

Although the threats to habitat described above affect all salmon species, additional threats specifically affect Chinook salmon habitat. Chinook salmon typically spawn in larger rivers and their tributaries, using deeper water and larger gravel for egg burial. They have highly variable life history strategies, reflected in their body size and timing of outmigration from rivers to salt water. Adult Chinook return to their natal rivers and tributaries to spawn after an average of three to four years in the ocean. However, only a small percentage of eggs produced by Chinook complete a full lifecycle and return as adults to their natal rivers [14].

Ocean-type Chinook out-migrate from their freshwater habitat on their way to the ocean at smaller sizes and as such, are most dependent on estuarine and nearshore habitat for rearing. By contrast, stream-type Chinook feed, grow and seek refuge in natal freshwater streams for up to a year before out-migrating to the ocean [15]. Increasing spawning capacity and survival from egg to smolt outmigration is critical for Chinook recovery and is accomplished by restoring fish passage to areas that have been made inaccessible and restoring habitat. While young Chinook remain in natal streams, they depend on clean, cool water and complex habitat with multiple channels, large wood,

boulders, side channels, healthy riparian area and connected floodplains. Floodplains provide refuge from high stream flow, calm feeding waters and space for Chinook to avoid predators. Chinook that rear in rivers with ample floodplains are larger than those that rear in rivers with no floodplain habitat and have higher survival rates [16].

For both ocean-type and stream-type Chinook, tidal wetlands found in both natal and non-natal river deltas and marine shorelines provide refuge from predation, feeding opportunities and brackish habitats that facilitate the physiological transition from fresh to saline waters [15]. Puget Sound has experienced 77 percent loss of vegetated estuarine tidal wetlands from natal Chinook deltas. Many of the large deltas in Puget Sound have lost freshwater tidal wetland habitat at disproportionate rates, with some areas having lost nearly 100 percent [17]. The lower Columbia River has lost 68–70 percent of its tidally influenced floodplain wetlands that provide critical foraging and rearing habitats for migratory Chinook [18].

Restoring fish passage, estuarine, nearshore, floodplain, instream flow and riverine habitat in concert with other actions will increase abundance, survival, productivity and distribution of salmon across the state. However, the degradation of habitat has occurred over the past 100 years and it will take decades to restore and protect it so it is properly functioning and able to sustain our salmon, buffer against climate change, improve water quality and quantity and ensure a healthy ecosystem.

Hatcheries

Hatchery production could play an important role in increasing prey abundance for Southern Resident orcas, especially in the intermediate term (three to 10 years), as increasing natural Chinook stocks will take more time. Although hatchery salmon production can be beneficial for increasing prey abundance for orcas, hatcheries can also pose genetic and ecological risks to wild salmon populations if not properly operated, for example:

- Hatchery fish often have lower reproductive fitness than wild fish. As such, when adult hatchery fish interbreed with wild fish it can lower the overall reproductive success of the wild population. To minimize this risk, fishery managers use methods such as weirs or mark-selective harvest to remove excess hatchery fish before they reach spawning grounds.
- Hatchery fish can decrease genetic and life history diversity (for example, run timing) in wild populations, in turn decreasing population resiliency and depressing wild population growth rates.
- Hatchery salmon can compete with juvenile salmon for food or habitat resources in rivers, estuaries and nearshore marine environments. The Independent Scientific Advisory Board report on density dependence from 2015 demonstrates the risk to wild salmon when habitat is insufficient to support both hatchery and wild salmon [19].

Releasing exceptionally large volumes of juvenile hatchery salmon near to wild populations can exacerbate these effects and decrease juvenile survival or population growth rates. Hatchery release strategies or timing can inadvertently attract predators and increase predation rates on both hatchery and wild fish, especially if hatchery releases are large, releases are compressed over a short period of time and predators have been behaviorally conditioned [20]. Hatcheries can also provide a false

sense of accomplishment, which may decrease public support and resources for natural fish recovery.

Decades of research and monitoring have identified the general risks to natural salmon production due to hatchery programs described above. The specific risks need to be evaluated on a case-by-case basis for individual hatchery programs. These risks vary across programs depending on hatchery size, location, operation and release strategies, as well as the underlying habitat condition and health of the affected wild populations. As a result, general risks are roughly proportional to the number of fish released, so the risks to wild salmon will generally increase with larger hatchery releases [21].

Reductions to hatchery production that have occurred over the years are mainly attributable to reforms in production plans and policies, lessons learned about optimizing hatchery production to yield more surviving adults and/or funding constraints. Future hatchery production can be closely monitored and adaptively managed to ensure progress is made on salmon recovery while the urgent prey needs for orcas are fulfilled.

Hydropower

Hydroelectric and water storage dams have significant but varied effects on fish that migrate up rivers from the sea to spawn, including Chinook. Dams can pose a threat to fish passage, slow the migration rate of juveniles and alter riverine ecosystems and function, which negatively affects salmon survival. When fish need to pass multiple dams on their way to the sea, it increases the likelihood of injury or death, especially if fish passage alternatives are limited. In particular, it can be difficult for juvenile salmon to pass dams to downstream habitat on their migration to the sea. When the current draws juvenile fish into a dam's turbine intakes, the majority of the fish are screened into bypass systems; however, fish that pass through the turbines could be exposed to pockets of low pressure, strike the turbine blades or find pinch points, all of which can injure or kill them.

In the Columbia River Basin, dams completely block passage to more than 55 percent of the spawning and rearing habitat historically used by Chinook [22]. Nearly all the blocked Chinook salmon habitat in the Columbia Basin is above Chief Joseph/Grand Coulee in the upper Columbia and the Hells Canyon complex in the middle Snake in Idaho. Many dams in Puget Sound, the Lower Snake River (Figure 2) and the Columbia River Basin (Figure 3) have made substantial progress increasing salmon survival rates over the past few decades by providing fish passage structures. Refer to the text box below for examples of these structures [23].

In addition to fish passage structures at dams to get juvenile salmon downstream, “spill” (water routed through spillways) is used to improve survival rates of migrating fish. Spill is generally acknowledged as the safest route past a dam for juvenile salmon because it allows fish to avoid dam powerhouses and bypass systems. This may result in lower direct mortality and decreased “delayed mortality,” which occurs when fish have a weakened condition after traversing a river. Although spill can improve salmon survival, spilling water can also trap air that dissolves into the water below and saturates it with gases like oxygen and nitrogen. When water is supersaturated with dissolved gas, excess gas can build up in the bloodstream and tissues of fish, causing gas bubble trauma, which can in turn cause minor injuries or even death depending on the total dissolved gas concentration.

Figure 2: Status trend of total adult Chinook salmon in Snake River [24].

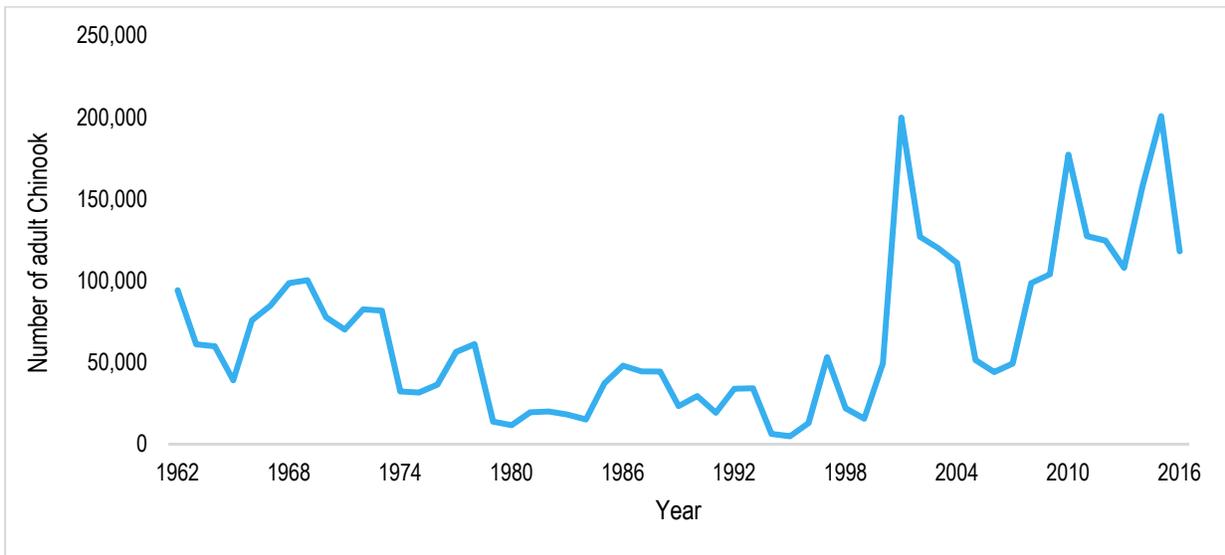
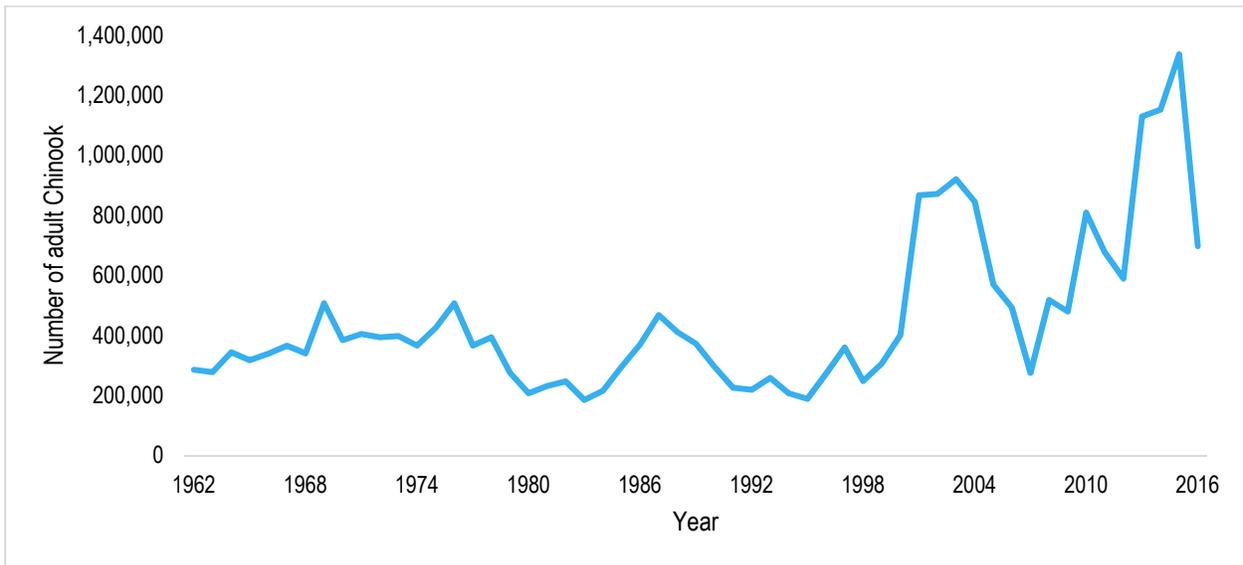


Figure 3: Status trend of total adult Chinook salmon in Columbia River [24].

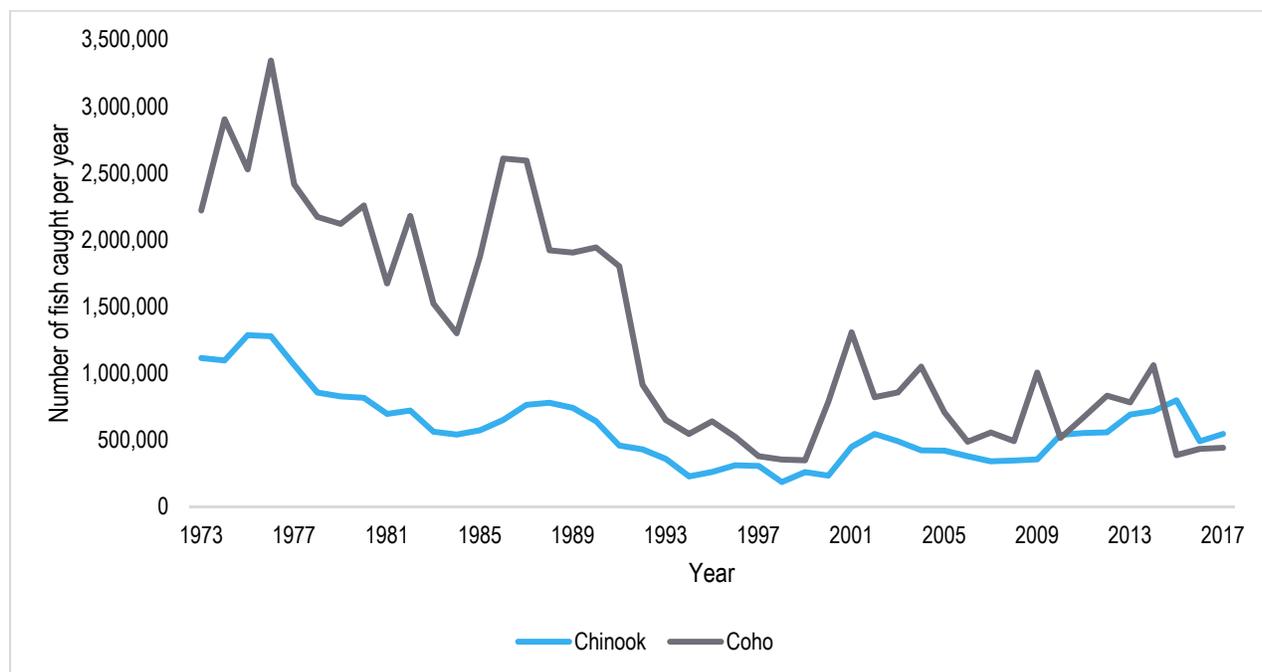


EXAMPLES OF FISH PASSAGE STRUCTURES INCLUDE:

- **Fish screens.** Fish screens allow water to flow from its source to its end destination while preventing fish from becoming trapped in pipes and other human-made structures.
- **Fish ladders.** Fish ladders resemble staircases filled with water that allow adult fish to ‘climb’ up and over the dam step by step. Water currents flowing from the fish ladder attract migrating salmon to the base of the stairway.
- **Trap and haul.** Migrating salmon climb a small fish ladder into a holding pool/tank where fish are ‘trapped’. Vehicles then ‘haul’ and release the fish upstream to the other side of the dam.
- **Floating surface collectors.** Floating surface collectors have pumps that attract fish and nets that guide the fish towards the collection entrance. Once fish enter the collector, they are piped out of the dam downstream or trapped and hauled.
- **Spillway weirs.** Spillways control the flow release from dams and can be a safe exit for juvenile fish. Raised weirs draw water from the surface and make spillways easier for fish to find and navigate.
- **Fish-friendly turbines.** Improved turbine design allows for safer fish passage with curved walls and edges, fewer gaps for fish to get wedged into, reduced turbulence and blades that reduce strikes.
- **Juvenile bypass systems.** Juvenile bypass systems use fish screens to discourage juvenile fish from approaching conventional turbines and direct them instead into dam gatewell pipes that carry fish into collection channels where they can safely exit the dam.
- **Improved culverts.** Culverts are large pipes that allow water to pass under roads. Fish-friendly culverts have lower water level entrances and larger upstream openings, making it easier for fish to enter and exit than conventional culverts. They also provide a less steep angle inside with deeper and slower moving water for fish to pass through.
- **Improved tide gates.** Tidelands drained for agriculture use tide gates to prevent water from flooding the area during high tide. Streams and marshes surrounding the tide gates provide habitat for small fish. Fish-friendly tide gates use floating mechanisms to hold the gates open, allowing fish to move freely between tide land and drained land.

Harvest

Harvest decreases the number of adult fish available to Southern Residents; reducing harvest or altering harvest methods in some areas may make more adult Chinook available to orcas. Chinook that originate in Washington may be harvested in fisheries in Alaska, British Columbia, off Washington’s coast or in Washington’s inland waters before they reach their natal spawning grounds. In recent years, however, fishing has been increasingly restricted in response to declining salmon abundances. Commercial, recreational and tribal salmon catches have decreased steadily in Washington’s marine and freshwater areas since the early 1970s, particularly for Chinook and Coho salmon (Figure 4).

Figure 4: Total Washington Chinook and Coho salmon harvest [25].

To carefully manage for harvests of more abundant hatchery salmon while protecting wild stocks of conservation concern, the Washington Department of Fish and Wildlife has worked with tribal co-managers and National Oceanic and Atmospheric Administration Fisheries to develop an integrated harvest-management system that supports sustainable fisheries while protecting weak salmon populations. A milestone in that effort was the development of "mark-selective" recreational fisheries in the late 1990s, when WDFW began to restrict the catch to hatchery-reared salmon in specific areas. Mass-marking hatchery salmon with a fin-clip before their release has made them readily identifiable in recreational mark-selective fisheries. This strategy has allowed fisheries to continue even in areas where wild salmon populations have been listed for protection under the federal Endangered Species Act. In those areas, the inadvertent "take" of any listed fish is closely monitored to ensure compliance with strict federal conservation standards. These conservation measures have brought significant changes to Washington's salmon fisheries, reducing the annual catch in many areas.

Salmon fisheries are planned carefully each year to ensure biologically based conservation objectives (spawning escapement numbers and limits on mortality caused by fisheries) for salmon populations are met. Fisheries are planned through a combination of international and domestic management processes. For Washington fisheries, this process includes the Pacific Salmon Commission (U.S.-Canada Pacific Salmon Treaty), the Pacific Fisheries Management Council (fisheries off the west coast of the U.S.) and the North of Falcon (fisheries off the Washington coast and in inland waters) forums. State and tribal co-managers work together in each of these annual forums to plan and implement fisheries that will meet conservation objectives based on predicted abundances of returning salmon that year.

Ocean and inland marine harvest typically occur on mixed stocks of salmon. Fisheries managers account for effects on specific stocks in these fisheries to ensure conservation objectives for individual stocks are met. Terminal fisheries, where harvest occurs in marine and freshwater areas close to the spawning grounds of a particular salmon population, primarily harvest stocks destined for the local watershed, as opposed to the larger mix of stocks harvested in fisheries outside of the terminal areas. Effects in terminal fisheries are also accounted for to ensure management objectives for individual stocks are met. In some terminal fisheries, abundance of returning salmon may be estimated in-season and fisheries adjusted to ensure spawning escapement targets are reached.

An estimated 1,337,301 Chinook were caught in Pacific Salmon Treaty fisheries in 2017. Approximately 62 percent of these Chinook were taken in US fisheries and 38 percent were taken in Canadian fisheries [26]. This estimate includes Chinook caught in both marine waters and terminal or freshwater fisheries.

Predation

Predation affects the abundance of Chinook and other salmon available to the Southern Residents. Salmon predators can benefit from artificial habitat features that serve as advantageous resting and feeding structures, such as piers, pilings, buoys, boat docks, log floats and log rafts. Where artificial structures coincide with Southern Resident foraging hotspots or salmon “pinch points,” predators may compete for the same prey the Southern Resident orcas depend upon. The salmon predators of most interest and/or study are:

- **Pinnipeds** such as sea lions and seals.
- **Fish** such as walleye, northern pikeminnow, northern pike, catfish and smallmouth bass.
- **Birds** such as cormorants and terns that feed on juvenile salmon.
- **Other Resident orcas** such as Northern Resident orcas and Southern and Western Alaska Resident orcas, which prey upon salmon stocks before they reach the range of the Southern Residents.

Pinnipeds

Since the adoption of the Marine Mammal Protection Act in 1972, west coast harbor seal and sea lion populations have increased and consumed more salmon. For example, throughout their range from Southeast Alaska to central Mexico, California sea lions have increased from 80,000 in the 1970s to 260,000 today [27]. California and Steller sea lions prey on adult salmon and steelhead before they move up the fish ladders at Bonneville Dam and areas downstream in the lower Columbia River. Both nonlethal and lethal control actions have been undertaken near Bonneville Dam since 2008. Even with these actions, pinnipeds at the dam consumed 6,663 salmonids per year on average between 2013 and 2017. This represents between 2.1 and 5.8 percent of the annual adult salmon run, but this estimate does not include predation that occurred in the estuary or in the 145 river miles before the dam [28]. Between 2010 and 2015, an estimated 20 to 44 percent of spring Chinook salmon that originated above Bonneville dam were lost between the Columbia River estuary and Bonneville Dam to sources other than harvest [29]. In 2015, when the estimated loss was 44 percent, this equated to 224,000 spring Chinook [29]. Sources of the unaccounted mortality include predation by pinnipeds, which is the most likely source, although losses from sampling or disease or straying into rivers below Bonneville Dam may be factors unaccounted for in the estimate [29]. The Independent Scientific Advisory Board noted that a life-cycle model by NOAA Fisheries predicted pinniped predation to be one of the top three factors affecting extinction probability for Upper Columbia River spring Chinook. Ocean conditions and hatchery effects were the other two factors [30].

Fewer datasets are available to evaluate the effect of seal and sea lion predation on salmonids in other geographic areas, particularly the Puget Sound, Strait of Juan de Fuca and outer coast. However, recent bioenergetics modelling work using information from the broader Salish Sea suggests the increase in abundance of harbor seals may also adversely affect Chinook, and consequently, Southern Residents [31]. Chasco, et al., 2017, report that between 1970 and 2015, the estimated annual biomass of Chinook salmon consumed by pinnipeds along the west coast has increased from 68 to 625 metric tons, or about double that of Southern Resident orcas and six times greater than the combined commercial and recreational catches. Both Canada and Washington are in the process of collating new pinniped population and diet information and updating models to determine more recent and geographically specific levels of Chinook consumption.

Transient or Bigg's killer whales prey upon a variety of marine mammal species, including pinnipeds. The increase in the harbor seal and sea lion populations has helped the transient orca population flourish and transient orcas are a key predator of harbor seals and sea lions in our region. Harbor seals represent at least half of the prey captured or attacked in British Columbia, Washington and Southeast Alaska [32, 33, 34, 35] and Steller sea lions and California sea lions are regular parts of the transient diet [33, 35, 36, 37]. The west coast transient orca population grew rapidly between 1975 and 1990 [35] and today numbers more than 500 animals [38]. A bioenergetic model of harbor seal consumption estimates 1,090 seals were consumed by transient killer whales in the Salish Sea in 2017 [39].

Fish

Northern pike are a nonnative invasive predator in Washington state that can restructure aquatic fish communities in some cases and lead to decimation of native fish communities including salmon and steelhead. Over the past several decades, illegal introductions of northern pike led to an expansion of their range. In Washington, they have been confirmed in the Spokane River, Lake Roosevelt and in the Columbia River upstream from Grand Coulee dam. They are not currently occupying salmon habitat, however, if they continue to increase in abundance in the blocked area above Chief Joseph and Grand Coulee Dams, they could expand their distribution into areas of the Columbia River where salmon and steelhead populations migrate up from the sea to spawn.

Northern pikeminnow, walleye and bass are also significant predators of salmon and represent a serious threat to salmon recovery. Northern pikeminnow, a native species, is managed for salmon recovery purposes under a sport reward program administered by the Bonneville Power Administration. Walleye and bass are nonnative to Washington. They prey on juvenile salmonids and compete for habitat in the Columbia River Basin and in most rivers in Puget Sound. A recent report estimated 24 million juvenile salmon are consumed annually by piscivorous fish between McNary Dam and Priest Rapids Dam on the Columbia River [40].

Birds

Artificial islands, piers, pilings and other features have led to high reproductive success and growing populations among predatory birds such as double-crested cormorants and Caspian terns. A variety of management actions have been implemented with the goal of reducing salmon predation by birds, including controlling the size of breeding populations on the lower Columbia estuary and some interior stretches of the Columbia River.

Other Resident Orcas

In addition to the Southern Resident orcas, other distinct populations of fish-eating resident orcas inhabit the Northeast Pacific, including Northern Resident orcas, Southern Alaska Resident orcas and Western Alaska Resident orcas. Northern Resident orcas' core habitat is in the coastal areas of British Columbia. Southern Alaska Resident orcas inhabit the waters of Southeastern Alaska and the Gulf of Alaska. Western Alaska Resident orcas inhabit waters west of Kodiak Island to the Aleutian Islands and the Bering Sea [41]. Some of these populations have geographically overlapping ranges, but each is reproductively isolated [42].

Fish are the major dietary component for resident orcas, with observations indicating salmon are preferred as prey. In one study, salmon represented at least 97 percent of Northern Resident prey, with Chinook comprising 69 percent of prey [33, 43]. Studies show Northern Resident orcas also captured older and larger than average Chinook. Predation by more northern populations of resident orcas may have a negative effect on salmon available to Southern Resident orcas, placing them at a competitive disadvantage [44]. In addition to experiencing a higher encounter rate of Chinook salmon, these more northern populations may also have their choice of a greater size distribution of individual Chinook [44].

Marine productivity and forage fish

Forage fish such as sardines, anchovies, herring, smelt and sand lance, provide important food for Chinook as they grow in the marine environment. In Puget Sound, Chinook salmon target primarily herring and Pacific sand lance. Low abundance of forage fish not only limits the food available for salmon, but also predators such as pinnipeds, birds and piscivorous fish, increasing the likelihood of salmon predation. Factors affecting the abundance of forage fish include loss of submerged vegetation, shoreline hardening, predation, water quality degradation, contaminants, climate variability and change, noise and light. Nearshore habitat restoration and protection is crucial, and assessment work is required to inform these and other actions to address limiting factors [45].

Both herring and surf smelt are harvested commercially and recreationally in Puget Sound. Commercial harvest of both species is relatively well monitored, but the harvest rate of smelt is unknown because no estimate of smelt biomass exists. Recreational harvest of surf smelt does not require a license and is poorly monitored. The effects of herring fisheries on individual herring stocks have not been assessed because movement patterns of herring away from the spawning grounds are not well understood. Better understanding of the stock composition of herring encountered in fisheries and an assessment of recreational harvest of smelt would help determine the potential effects of these fisheries.

Healthy marine forage fish and salmon populations also require appropriate quantity and quality of zooplankton prey, which is dynamic in time and space. Zooplankton comprise the vast majority of juvenile Chinook salmon and herring diets. Monitoring zooplankton in Puget Sound is critical to identifying how marine and local waters are responding to changing ocean conditions and to illuminate any underlying patterns in prey base composition, abundance and nutritive value that drive forage fish population dynamics and thus influence other species higher up on the food chain such as salmon and orca. Puget Sound studies suggest direct correlations between zooplankton and early marine survival of some Chinook populations. This relationship can improve the ability to forecast salmon returns, critical to managing a highly variable fishery to ensure enough salmon for Southern Resident orcas. This critical link between zooplankton and salmon also provides an opportunity to understand and separate the role of local environmental effects inside Puget Sound, such as nutrients, from broader scale factors impacting salmon abundance, including ocean variability and climate change. Finally, it helps determine whether local habitat restoration or marine conditions are responsible for annual changes in salmon abundance.

The health of forage fish populations also depends on ocean conditions. Starting in 2014, unusually warm ocean temperatures in the eastern Pacific Ocean – referred to as “the blob” – brought a shift to more gelatinous zooplankton, which have less energy to transfer to the forage fish that eat them [46]. Although ocean temperatures in that region returned more or less to average in 2018, the blob has had a lingering effect on salmon growth, size and survival. Adult salmon returns are expected to remain low for a few years [47]. At the time this report was going to press, studies indicated the blob might be returning. The climate change section below provides additional discussion of the effect of warming ocean temperatures on orcas and their prey.

Vessels

Vessels transiting near Southern Resident orcas can disturb and displace them from preferred areas. Vessels emit noise that spreads underwater through propeller cavitation (the formation and collapse of vapor cavities or bubbles) and via their combustion engines. Underwater noise can mask or impair orca echolocation (the method orcas use to find their prey) and communication. Vessels — including virtually silent ones such as kayaks — can also reduce the time orcas devote to foraging by almost 20 percent, reducing their potential prey intake and increasing their energy expenditure [48, 49, 50]. Models suggest Southern Resident orcas lose several hours of foraging time per day from May to September due to vessel noise and avoidance behaviors associated with ships and boat presence [51]. Key sources of concern include ships, small vessels, echo sounders and oil spills, summarized below.

Ships

Large ships tend to produce intense low-frequency noise that interferes with Southern Resident orca communication. Orcas compensate for increased underwater vessel noise by making longer and louder calls [52, 53], which has been shown to have modest metabolic costs in dolphins [54]. Furthermore, in coastal areas near busy ports, such costs can magnify the adverse effects of prey scarcity on reproduction and lactation [54].

Ships also emit noise at higher frequencies that overlaps with Southern Resident orca echolocation [55]. Washington state ferries are a large contributor to the underwater noise levels across Puget Sound because of the sheer volume of multi-daily transits throughout the region. Due to the growth of ports in British Columbia, shipping traffic is on the rise and likely to climb further. A relatively small percentage of ships (about 15 percent) are responsible for about half of related noise near the San Juan Islands [56], leading to optimism that targeted mitigations for such vessels would be effective [57].

The Enhancing Cetacean Habitat and Observation program of the Vancouver Fraser Port Authority has led voluntary, targeted trials to slow down ships and shift them away from key Southern Resident orca foraging areas near the international shipping lanes to reduce the level of shipping noise. Transboundary participation and compliance in these efforts has been high. Washington state currently has no program like ECHO.

Small vessels

Small vessels include recreational boats and whale-watching vessels under 65 feet in length (consistent with U.S. Coast Guard regulations). Small vessels tend to produce underwater noise intermittently [58] that can mask echolocation and communication, making it more difficult for Southern Resident orcas to find and capture prey [53]. Southern Residents spend less time foraging when vessels are nearby [59], leading to the supposition that this reduces the amount of prey they capture. Acoustic masking due to vessels is also thought to impair the detection of prey to the side of the Southern Residents' path [60], a reduction in their peripheral sensory range. Reduced

foraging, evasive behaviors and the production of louder calls can have metabolic costs, taking extra energy while the orcas are simultaneously getting less food.

To reduce disturbance and noise, small vessels must keep a 200- to 400-meter buffer distance from orcas per state and federal law. However, concern about compliance by recreational vessels is on the rise, particularly because the incidence of boats speeding toward or away from the whales has recently increased [61]. Vessels operating at moderate to high speed produce greater masking effects [62, 63]. While faster speeds increase the intensity of noise and the risk of vessel strikes, slower speeds expose orcas to the noise for longer periods, thus raising the potential for longer masking periods.

Underwater noise from vessels may also have communication and social costs for orcas. Dispersed Southern Resident orca pod members use their vocalizations to coordinate their movements and communicate about feeding opportunities [64]. Orcas vocalize more often during active foraging [65]. Noise may diminish group cohesion and coordination, as it shortens the distances over which calls can be reliably heard by other orcas [66]. To date, most attention on the potential masking effects of noise on Southern Resident orcas has focused on frequency masking and mitigating the loudness and duration of exposure. Experts have recently advised that intermittent acoustic distractions and *informational* masking should be considered too [67]. In particular, the exchange of social information, including food-related signaling [68] and prey-sharing among Southern Residents, can be compromised over an even greater spatial range. Because individual orcas can be identified by the distinctive duration of certain elements of their calls, the finding that noise leads orcas to extend the duration of their calls [52] suggests vessel noise could make it harder for orcas to recognize each other.

Experts contend that the physical and temporal context in which marine mammals encounter noise is highly meaningful [69]. For example, the potential for underwater noise to reverberate and inhibit communication varies spatially. Even minor, but repeated exposures can lead to net chronic effects; dolphins, for example, have been shown to abandon areas due to tour boat activity [70]. In a similar vein, harbor porpoises avoid intermittent noise more than continuous noise [71]. Ayers et al. (2012) suggest Southern Residents may show a stress response to the cumulative effects of vessel traffic in the Salish Sea particularly during years of relatively low Fraser River Chinook abundance. As implied in the population modeling of Lacy et al. (2017), reducing human-created noise and disturbance from vessels — accompanied with a moderate increase in prey availability — should jointly hasten the recovery of Southern Residents. Because mitigation of vessel impacts can be accomplished relatively quickly compared to an increase in the abundance of Chinook salmon, rapid implementation of vessels-related recommendations by the task force can have an immediate benefit for the Southern Residents.

Echo sounders

Underwater transducers such as echo sounders and depth finders use 200-decibel pulses of sonar to transmit sound waves into the water for navigational or commercial and recreational fishing purposes [72]. Studies have highlighted the adverse effects of this equipment on cetaceans [73]. Sonar noise from such devices near orcas, especially at commonly used frequencies of 50 and 80

kHz, overlaps with prime echolocation frequencies [74]. Research shows pulses at 85 kHz can travel more than one kilometer before substantially weakening [75]. Theoretically, the acoustic footprint for a 50 kHz pulse should be even greater at similar range, due to the reduced attenuation of lower frequency in sea water and the broader spread of lower frequencies.

Preliminary results from National Ocean and Atmospheric Administration suggest Southern Residents near the San Juan Islands are exposed to transducer noise more than one-third of the time [76]. This level and intermittence of exposure could impair the orcas' ability to locate and hunt for prey. Outputs from such devices have induced avoidance behavior in seals [77] and led to increased vigilance behavior in other toothed whales [78]. Many modern echo sounders are dual-frequency at 50 and 200-kHz, and the latter frequency does not overlap with the orcas' hearing range.

Manufacturers have indicated contemporary transducers that operate at 1kW have separate transmitters for each frequency, which means each frequency can be disabled at will, and that by switching such units to the 200-kHz setting, boaters can avoid sending 50-kHz pulses into the water column. Therefore, by switching to the 200-kHz frequency when safe to do, many boaters can avoid potential disturbance to orcas. However, it appears most basic entry-level units that operate at 660W change only what is displayed on the monitor and do *not* shut off the 50-kHz pulses that overlap with orcas' hearing.

Oil spills

In addition to the threats related to the disturbance and noise from vessels, major oil spills represent a persistent, low-probability/high-impact risk to Southern Residents. The population's vulnerability to oil spills is magnified because so few females are of reproductive age in the population and pods often aggregate off the San Juan Islands near portions of the international shipping lanes that show greater relative oil spill risk than much of the Salish Sea [79, 80]. Alaska has witnessed the vulnerability of local orcas to major spills, including the loss of reproductive females in one population [81].

Studies examining the effects of oil exposure on other marine mammals have demonstrated them to be both physiological and toxicological [82]. Toxicological effects include fetal distress and in-utero pneumonia, conjunctivitis, increased levels of stress hormones in blood, brain damage, emphysema, lesions on the adrenal gland and lungs, stomach erosions and ulcers and liver disease.

Researchers recently simulated a four-million-gallon diluted bitumen oil spill north of the San Juan Islands and estimated it would cover between 22 and 80 percent of the Southern Resident orcas' inland critical habitat [83]. The recent population viability analysis by Lacy et al. suggests a catastrophic oil spill of two to four million gallons would kill between 12.5 and 50 percent of the Southern Resident orca population [84].

Contaminants

Southern Resident orcas and their prey are exposed to an ever-increasing mixture of pollutants in the marine environment. The Contaminants working group identified the following primary

contaminants of concern as most important to address for the health of orcas and/or their prey: polychlorinated biphenyl, polybrominated diphenyl ether, dichloro-diphenyl-trichloroethane, polycyclic aromatic hydrocarbons and contaminants of emerging concern. The toxic industrial contaminants PCBs, PBDEs and DDTs have been banned and are often referred to as “legacy pollutants,” however, they are still contaminants of great concern for Southern Resident orcas and their prey. Widespread uses of PCBs, PBDEs, DDTs and other chemical-laden products created before bans or regulations were enacted have resulted in the extensive distribution of these contaminants in the natural environment. Moreover, these toxic contaminants are poorly metabolized, persistent in the environment and bioaccumulate and bio-magnify in the food web. Each of these individual contaminants and its specific effects on orcas are presented in the “Contaminant details” section below.

Food web interactions

Contaminants enter the Salish Sea through stormwater, wastewater, air deposition, biological transport and direct water contamination (such as oil or chemical spills and/or groundwater) and inevitably enter the food web. Some of these contaminants persist in the environment and increase (or biomagnify) up the food chain from zooplankton and forage fish [85, 86, 87] to adult Chinook salmon [88, 89]. At the top of the food chain, these contaminants can accumulate in long-lived, high level predators including Southern Resident orcas [90, 91, 92, 82].

Forage fish

The prey of adult Chinook salmon in Puget Sound, which includes Pacific herring and other forage fish, are exposed to persistent bioaccumulative contaminants [87, 86] as well as non-bioaccumulative contaminants [93] in sensitive rearing habitat in the Salish Sea and Columbia River Basin. These contaminants reduce the health and survival of forage fish while also reducing the food supply available to adult Chinook salmon.

Chinook salmon

Adult Chinook salmon are a major source of persistent toxic chemicals to Southern Resident orcas [82, 94, 88, 89]. Puget Sound Chinook salmon and some Fraser River Chinook salmon (Harrison and Chilliwack populations) accumulate higher concentrations of PCBs and PBDEs than other Chinook salmon populations because of their time spent foraging in the Salish Sea and the Puget Sound [82, 89, 95], where forage fish are highly contaminated [87, 86].

Additionally, the health and survival juvenile Chinook salmon from Puget Sound and the Columbia River, may be reduced by their exposure to toxic contaminants [96, 97, 98, 99, 100]. In particular, toxics can reduce juvenile Chinook salmon survival by reducing their growth and making them more susceptible to disease [101, 102, 100]. Specific contaminant hotspots for juvenile Chinook salmon include the Duwamish estuary and river, Commencement Bay, Snohomish estuary, Anacortes, Portland Harbor, Hanford Reach, Sinclair/Dyes Inlet and Lake Union. Hotspots in British Columbia include Victoria Harbor and the Fraser Delta.

Southern Resident orcas

High levels of persistent toxic contaminants including PCBs, PBDEs and DDTs are present in the blubber of Southern Resident orcas, potentially resulting in harmful health effects including alterations in hormone levels, reproductive disruption or miscarriages, reduced immunity to diseases, neurotoxicity, neurobehavioral disruptions and cancer [82]. The toxic effect of these contaminants is further exacerbated by periods of weight loss, which can redistribute contaminants from fat stores (blubber) to other tissues, increasing the toxic response [103]. When starving whales draw on fat reserves stored in their blubber, it mobilizes contaminants into circulation, where they have the potential to cause a greater toxic response. Orcas with higher contaminant levels in their blubber also have higher levels circulating in their blood, even when they are well fed. This effect has been demonstrated in dolphins [104] and the National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center has unpublished data on orcas that also show this effect.

Contaminant details

Polychlorinated biphenyl

PCBs are commonly found in caulks, paints and dyes in old buildings, in old power transformers and at toxics clean-up sites. PCBs were banned from production in the United States in 1979, but because they do not break down easily in the environment, they persist in air, water, soil and organisms. A rich base of literature shows PCBs are distributed globally, found in plants and animals from the remotest regions of the planet. PCBs are still released into the environment through improper disposal, incineration and poorly maintained hazardous waste sites [105]. Furthermore, PCBs can be found at low concentrations in many current-use consumer products (for example, toothpaste, yellow dyes and plastics) due to either inadvertent production or recycled use. Long-term contaminant monitoring shows PCBs in the food chain are high and have not measurably decreased over the past 20 years in the central and southern basins of Puget Sound. This indicates ongoing inputs to these areas from the sources noted above [87].

PCB levels are at concentrations exceeding a health effects threshold for marine mammals (extrapolated from effects in seals, otters and mink) in most sampled Southern Resident orcas [91, 92, 82]. The concentration of PCBs in male Southern Resident orcas is almost four times higher than those of male Northern Resident orcas [106]. Female orcas pass these contaminants on to their offspring when they give birth and nurse, which can reduce the survival of their young pups [107].

PCBs are also elevated in juvenile Chinook salmon collected from urbanized river-estuaries in Puget Sound [108, 96] and approximately one-third of the salmon collected in Puget Sound have PCB concentrations above an adverse-effects threshold for salmon health. Moreover, the survival of juvenile Chinook salmon from these urbanized estuaries was 45 percent lower than Chinook collected from uncontaminated estuaries [98]. PCBs were also elevated in Chinook salmon migrating from the Columbia River, with 32 percent of fish samples collected in the vicinity of Portland, Oregon and Vancouver, Washington found to be above an adverse-effects threshold for salmon health [99].

Although the majority of Chinook salmon originating from Puget Sound migrate to the Pacific Ocean to feed and grow, approximately one-third reside in the Salish Sea for much of their marine rearing phase [109, 89]. Here, they are exposed to persistent organic pollutants through their diet, including Pacific herring and other oceanic fishes, which are highly contaminated in Puget Sound [110, 86].

Polybrominated diphenyl ether

PBDEs were created primarily as flame retardants for industrial and domestic uses. They are found in products such as furniture, mattresses, hard plastics such as television casings, foam nap and gym mats, and car seats. They are especially concentrated in residential dust and travel from homes to Puget Sound through wastewater. PBDEs are associated with altered thyroid levels, a hormone important for growth and metabolism.

High concentrations of PBDEs have been observed in Southern Resident orcas [111, 91, 92]. Adverse health effects associated with exposure to PBDEs include endocrine disruptions, liver and thyroid function impairment, autoimmunity induction, immunosuppression and impacts on lung and neural development [82]. In the Southern Resident orca community, PBDEs have been shown to be highest in J pod, attributed to its time spent in Puget Sound and closer proximity to urban environments relative to the other pods [112].

Juvenile Chinook salmon from the Snohomish and Puyallup river systems in Puget Sound have also shown elevated PBDEs [97, 113, 96] at concentrations that can increase their susceptibility to disease and alter thyroid levels involved with growth and smoltification [101, 114]. In the Columbia River, PBDEs are elevated in juvenile Chinook salmon, especially fish collected in the vicinity of Portland, OR and Vancouver, WA [97]. Although PBDEs have also been measured at high levels in forage fish, their concentration has been declining [87].

Dichloro-diphenyl-trichloroethane

DDT was formerly used as a widespread insecticide on numerous crops. DDT and its toxic chemical break-down products and metabolites (dichloro-diphenyl-dichloroethylene and dichloro-diphenyl-dichloroethane) persist in soils and aquatic sediments and are now found in agricultural areas throughout the Columbia River Basin and central California. DDTs are the dominant toxic chemical found in Southern Resident pods K and L [112]. DDT is carcinogenic and has been shown to impair immunity and affect liver and nervous system function in mammals [115, 82].

DDTs are not elevated in forage fish or juvenile and adult Chinook salmon from Puget Sound. In the Columbia River, however, juvenile Chinook salmon yearlings (salmon spending a year in the river) had higher concentrations of DDTs than sub-yearlings, with 14 percent of samples exceeding an adverse effects threshold versus 1.1 percent of samples from sub-yearlings [99].

Polycyclic aromatic hydrocarbons

PAHs are a class of compounds derived primarily from petroleum products or the combustion of these products and can enter the aquatic environments directly (for example, through an oil spill) or

indirectly (for example, through stormwater runoff or atmospheric deposition). PAHs are commonly found in creosote-treated wood (marine pilings, utility poles, etc.), vehicle emissions/exhaust and leaks, marine vessel leaks and spills, wood smoke and industrial emissions.

Compared to other organic contaminants (PBDEs, DDTs and PCBs), PAHs have a relatively low risk of bioaccumulation in Southern Resident orcas [82]. Most PAH chemicals are metabolized by vertebrates so they do not tend to bioaccumulate, meaning PAHs are unlikely to magnify like other contaminants. Vertebrates such as marine mammals and fish rapidly metabolize PAHs, sometimes into more toxic forms eliminated from the body in urine or feces [116].

Even though bioaccumulation and magnification do not play a significant role in PAH toxicity, PAHs still present risk from direct exposure [82]. Animals are exposed to and take up PAHs present in the environment through multiple pathways, including inhalation, dermal contact, or consumption of PAH-contaminated prey or sediments [117]. A recent study documented Southern Resident orcas are exposed to PAHs through vehicle exhaust [118], however, information on the effects of such is lacking.

PAHs are toxic to the Chinook salmon upon which the Southern Resident orcas feed, altering their growth or making them more susceptible to disease. Concentrations of PAHs found in Chinook salmon stomachs have exceeded concentrations known to alter salmon growth and energetics and reduce immunosuppression [119, 102]. Juvenile salmon in urbanized estuaries of Puget Sound rivers and in urbanized habitats of the Columbia River are exposed to PAHs via their prey (forage fish). In forage fish, PAHs have been linked to developmental deformities, liver toxicity, a dysfunctional adrenal system and other adverse effects [120, 121, 122, 123].

PAHs are present in nearshore habitats of Puget Sound where salmon prey on forage fish such as herring [124, 125]. The combination of sunlight and oil (PAH) contamination can be lethal to fish embryos [126]. Herring exposed to low concentrations of PAHs still experience development abnormalities, which have lasting adverse effects on the populations [121, 120, 122].

Contaminants of emerging concern

CECs include a broad range of chemicals found in widely used everyday items such as pharmaceuticals and personal care products (soap, lotion, cosmetics), detergents, plastics, water-resistant clothing and some pesticides. They also include toxic flame retardants (including new variants of PBDEs), phthalates, bisphenols, alkylphenols and highly fluorinated or per- and polyfluoroalkyl substances. CEC exposure can result in a variety of adverse effects, but data is limited on where they occur in the environment, where they ultimately end up and how toxic they are to orcas and their prey.

CECs have been detected regionally and globally in aquatic habitats. They enter rivers, estuaries and marine habitats from various sources, including discharges from wastewater treatment plants, aquaculture operations, industrial outfalls, stormwater outfalls and surface stormwater runoff from impervious surfaces, landfills, agricultural lands and lands where biosolids were applied. Under current law, many CECs are not regulated or assessed for toxic effects before they are introduced

into commercial or industrial processes. Many CECs are suspected endocrine (or hormone) disrupters, which can have developmental, neurological, reproductive and immune effects.

In most cases little information exists on the specific toxicity of CECs to Southern Resident orcas or their prey. However, recent studies have detected CECs in wastewater effluent [127, 128], estuaries [128], in juvenile Chinook salmon and in a bottom dwelling fish [128, 129] from Puget Sound. Levels of a variety of pharmaceuticals occurred in the range expected to produce adverse effects in juvenile Chinook salmon [130, 129]. Furthermore, in juvenile Chinook salmon collected from the Puget Sound, several blood chemistry parameters (early indicators of metabolic stress) were altered in fish from wastewater treatment plant-impacted estuaries, but fish from cleaner “reference sites” did not show the same effects [131]. Additionally, the correct function of mitochondria — energy factories of cells, which enable actively growing fish to process oxygen and convert nutrients — was impaired in fish from wastewater-impacted sites [132].

To reduce or remediate contaminant inputs, management actions must address the major sources of contaminants to Southern Residents orcas, their prey and forage fish, including:

- **Contaminated sediments.** Clean-up of toxic contaminants in sediment is slow, not always prioritized and underfunded. Moreover, contaminants in sediments of major river estuaries are transported to the marine food web where forage fish are further exposed. Specific areas with contaminated sediments or wildlife and plants include: the Duwamish estuary and river, Salmon Bay, Commencement Bay, Snohomish estuary, Anacortes, Portland Harbor, Hanford Reach, Sinclair/Dyes Inlet and Lake Union. Hotspots in British Columbia include Victoria Harbor and the Fraser Delta.
- **Stormwater runoff.** Extensive monitoring data shows stormwater runoff contains high concentrations of toxic chemicals. Toxic stormwater hotspots include commercial and industrial lands, adjacent roadways and parking areas and high traffic areas throughout the region, as well as known geographic hotspots, including the Snohomish River and Duwamish River basins and Salmon Bay in central Puget Sound. Although new and redeveloped land must meet stricter standards, retrofitting current developments with modern stormwater controls has been delayed because of funding gaps, lack of a corrective imperative and the slow pace of redevelopment.
- **Other discharges of toxic contaminants.** Current National Pollutant Discharge Elimination System regulations for many wastewater, industrial and stormwater facilities allow discharges of toxic contaminants that can impact Southern Resident orcas and their prey. It can be very expensive to clean up or provide stormwater and wastewater treatment at these “end of pipe” locations. A more cost-effective approach is to prevent contaminants from coming into these systems in the first place.
- **Toxics in consumer products.** A common pathway for some contaminants, especially contaminants of emerging concern, to enter the environment is through use of a variety of consumer products. Some toxic chemicals (for example, non-PBDE flame retardants, phthalates, per and polyfluoroalkyl substances and alkylphenols) are flushed or poured down the drain in our homes or businesses. PBDEs in consumer products such as couches,

bedding, electronics and personal care products can break down as fine dust or particles. Dust is picked up on clothing, rinsed off in washing machines and then transported into the wastewater stream. These contaminants eventually make their way into wastewater treatment plants, where some are poorly removed. PCBs are also found in low concentrations in current-use consumer products (for example: toothpaste, yellow dyes and plastics) due to either inadvertent production or recycled use.

- **Pharmaceuticals.** Some CECs such as pharmaceuticals are excreted by people and animals or flushed down toilets, entering the Puget Sound via wastewater and/or stormwater.

Climate change

Climate change is an overarching threat that will affect the Southern Residents primarily through the food web. Climate change exacerbates current stresses on the Chinook salmon populations Southern Residents rely on. Observed and projected changes in climate include increased air and water temperatures, more severe heavy rainfall events in the winter, lower summer stream flows, changes to the magnitude and timing of low and peak stream flows, changes from snowmelt to rain dominant stream systems, increased sedimentation and rising sea levels [133, 134, 135, 136, 137]. Climate change will continue to affect salmon habitats and salmon populations at each life stage.

In the Salish Sea and Pacific Northwest, observed and projected impacts include the following:

- **Warmer stream temperatures** deplete energy reserves, decrease growth rates and make salmon more vulnerable to predation and disease. They can also impede upstream or downstream migration. One study of fall Chinook salmon in the lower Columbia River found their average migration rates slowed when water temperatures rose, as the fish waited in cooler tributaries [138]. Warmer streams can also favor warm-adapted nonnative fishes that can outcompete or prey on salmon [133].
- **Lower summer stream flows** impede upstream and downstream migration and reduce freshwater habitat capacity.
- **Heavier winter rainstorms** lead to high-flow events that can scour river beds and destroy or smother salmon redds (nests). More heavy precipitation events may also increase contaminant runoff into salmon-bearing streams.
- **Warmer ocean temperatures** increase metabolic demands, reduce salmon size and reduce return rates, as shown in a study of juvenile salmon along the coasts of Washington and Oregon [139]. Warming ocean temperatures can affect the base of the food web, changing the phytoplankton and zooplankton composition to lower calorie species [140, 141]. It can also promote the abundance of harmful algae, toxic to fish, and plankton grazers such as jellyfish, which are a caloric dead end in the food web due to their few predators [142, 143]. Further, changes in weather patterns can affect spring bloom timing and magnitude in the Salish Sea [144]. These issues can precipitate up the food web and affect the growth and survival of juvenile salmon and forage fish. Forage fish support both salmon and higher order predators such as piscivorous fish, marine mammals and seabirds. When forage fish abundance is limited, these predators can increase predation on juvenile salmon. Warmer

ocean temperatures could also bring more predators into the region, including Pacific hake and mackerel [145].

- **Sea-level rise** reduces habitat and spawning grounds available to forage fish such as smelt, sand lance and herring that spawn in the intertidal and shallow subtidal. Effects will be seen sooner and more dramatically on hardened beaches with shoreline armoring, due to their inability to adjust to sea-level.

Abdul-Aziz et al. projected by 2100, under a moderate greenhouse gas emissions scenario, summer habitat for Chinook salmon in the North Pacific will decrease by 86 percent compared to 1980 levels as a result of warmer temperatures [146]. A study on the effects of increased atmospheric carbon dioxide predicted adult Fraser River sockeye salmon would be smaller and less abundant [147].

A 2017 report by the University of Washington Climate Impacts Group and the Puget Sound Partnership concluded the orca recovery goal was at high risk from climate change impacts because the projected decline in Chinook abundance will lead to increased nutritional stress and disease susceptibility for the orcas. It noted warmer waters may also bring new pathogen and disease vectors that could be harmful for orcas [148].

Increasing levels of carbon dioxide in the atmosphere also contributes ocean acidification which will adversely affect many marine species. Increased levels of atmospheric carbon dioxide are absorbed by the ocean, reacting with the water to form carbonic acid which increases hydron ion (H⁺) concentrations and results in a lower oceanic pH (more acidic). Recent studies on juvenile coho salmon exposed to low level pH, representing projected future scenarios, showed disruption of olfactory driven behaviors and related neural signaling pathways. Although the salmon's ability to smell remained intact, their response to alarm odors was indifference, versus a typical fear and avoidance response. Olfaction plays a central role in salmon survival, navigation and reproduction. These neural signaling pathways are highly conserved across many species, indicating other salmon species could be at risk as well [149]. Although few studies exist on the direct effects of ocean acidification on Pacific salmon species, studies of projected future ocean acidification scenarios on tropical reef fish showed reduced growth, behavioral changes and decreased survival [150, 151].

Salmon are also likely to be impacted through food web changes, as ocean acidification can negatively affect organisms such as copepods that are a primary food source for forage fish such as sand lance, herring and surf smelt [152, 153]. The combined effects of ocean acidification on zooplankton and rising sea-level on forage fish nearshore spawning habitat will continue to perturb the food web that salmon and orcas rely on for survival in unpredictable ways. As such, we must seek to reduce and mitigate other stressors.

The Prey working group analyzed the relevance of climate change to the potential prey actions presented for task force consideration. They noted:

- Summer and fall Chinook are expected to be more resilient than spring Chinook to climate change effects due to their late run timing, spawn timing and sub-yearling migrant life history.

- Many of the most important Chinook habitat areas for acquisition and protection are also the most susceptible to climate change (sea-level rise resulting in estuary and floodplain inundation due to encroaching seawater or floods, respectively).
- In the long term, removal of dams that lack fish passage, combined with reintroducing fish into formerly blocked areas, can offer access to cooler water in high-elevation headwater areas and eliminate heating behind dams. Where dams remain, they can help store water to mitigate against low water years. Some reservoirs behind dams provide cool water in the summer and flow improvements when needed. Both can buffer against climate change.
- Monitoring zooplankton is critical to understanding and separating the influence of climate change on salmon and forage fish growth and survival from the hatchery, harvest and habitat actions we take [154].
- The impacts of climate change should be accounted for when assessing hatchery facilities for increased production, including facility water temperature and availability, river access to hatcheries and disease management. Further, consistent with current recommendations, hatchery managers should assess stock selection, growth rates and release timing as tools for reducing climate impacts to salmon as they live out their lives in the rivers and ocean.
- Climate change should be considered in prioritizing habitat restoration projects.

The Legislature has recognized the need to act on climate change and to reduce the severity of its threat to Washington. In 2008 the Legislature set limits on Washington's greenhouse gas emissions. The law requires the state to:

- By 2020, reduce overall emissions of greenhouse gases in the state to 1990 levels.
- By 2035, reduce overall emissions of greenhouse gases in the state to 25 percent below 1990 levels.
- By 2050, do its part to reach global climate stabilization levels by reducing overall emissions to 50 percent below 1990 levels, or 70 percent below the state's expected emissions that year.

In addition to the state taking actions to meet its greenhouse gas reduction goals, it must also consider anticipated changes in the climate when determining how to approach habitat restoration, salmon hatchery management, salmon and forage fish harvest management and other actions intended to help recover Chinook salmon and Southern Resident orcas. Implementing agencies and partners must monitor changes in climate as well as the effectiveness of projects and actions and adjust approaches as needed to maximize the benefit to salmon and orcas. At the same time, some of the recommended actions can also help build broader ecosystem resilience and therefore have benefits for other species and human communities in addition to benefiting salmon and orcas.

The task force developed many recommendations that contribute to addressing climate change impacts. For example, recommendations include restoring and protecting habitat which results in cooler rivers and riparian buffers that sequester carbon. Properly functioning rivers also help reduce flood risks and enhance reliability of water. Opening fish passage allows salmon access to cooler upstream habitat, and reintroducing salmon above blockages allows them to colonize healthy

productive headwater habitats. Protecting habitat from being converted to other uses will also help to buffer against potential climate change impacts.

Most vessels recommendations emphasized immediacy, but two of them highlighted longer-term measures to reduce underwater noise and increase sustainability in the maritime sector, including ferries and shipping. The governor has convened a separate, concurrent Maritime Innovation Advisory Council to develop the Washington Maritime Blue Strategy to lead the country in accelerating innovation for the maritime sector's shift towards deep de-carbonization and low-impact vessels with benefits including noise reduction and improved water quality.

Ongoing and immediate actions

As part of Executive Order 18-02, Gov. Inslee directed the following state agencies to take immediate actions to support Southern Resident orca recovery:

- Washington Department of Fish and Wildlife
- Governor's Salmon Recovery Office
- Puget Sound Partnership
- Washington State Parks and Recreation Commission
- Washington State Department of Ecology
- Washington State Department of Transportation
- Washington State Department of Licensing

The nine immediate actions the governor directed these state agencies to take are outlined in Table 1. Progress updates are provided in Appendix 4.

Table 1: Summary of immediate actions directed in Executive Order 18-02 and responsible agencies

Action	Deadline	Responsible Agencies						
		WDFW	GSRO	PSP	State Parks	Ecology	WSDOT	DOL
Develop implementation plans for increased enforcement, outreach and education of vessel regulations as well as enforcement of Chinook fisheries regulations in areas frequented by orcas.	04/30/18	●			●			
Review 2018 recreational and commercial fishing regulations prioritizing protection of key areas and fish runs for Southern Resident recovery.	04/30/18	●						
Explore options and develop a proposal to alter fish food used in state hatcheries to limit the amount of polychlorinated biphenyls in Southern Resident prey.	04/30/18	●						
Create a curriculum to improve and increase the number of trainings for vessels in the whale watching industry to become “vessels of opportunity” to assist in the event of an oil spill	04/30/18					●		
Develop strategies for quieting state ferries in areas most important to Southern Residents.	05/31/18						●	
Prioritize existing outreach resources to support Southern Resident recovery. Collaborate with the Governor’s Office to develop a public education program and identify needed resources.	07/01/18	●	●	●	●			●
Identify the highest priority areas and watersheds for Southern Resident prey to focus or adjust, as needed, restoration, protection, incentives, hatcheries, harvest levels and passage policies and programs.	07/31/18	●	●	●				
Develop criteria to prioritize financial assistance beginning in the 2019–21 biennium for storm water projects that benefit Southern Resident recovery	07/31/18					●		
Demonstrate how Chinook recovery projects benefit Southern Resident recovery, beginning in the 2018 grant round, for the Pacific Coast Salmon Recovery Fund, the Puget Sound Acquisition and Restoration Program, the Estuary and Salmon Restoration Program and the Washington Coastal Restoration Initiative.	12/15/18	●	●	●				

Recommendations

The task force sought to develop a bold package of recommendations that, if implemented, would collectively have the impact needed to achieve the vision of a thriving and resilient Southern Resident orca population. The recommendations below are grouped under four overarching goals and include details for the governor, the Legislature, agencies and partners to consider during implementation. Recommendations are then summarized in a table that lays out the leads, key partners, and whether each recommendation requires state, federal or local action or decisions. The task force emphasized the importance of funding these actions in ways that are not detrimental to other ongoing programs that are also critical for the recovery of salmon and the Southern Residents. Task force members' votes on this final package of recommendations are recorded in Appendix 3.



RECOMMENDATIONS THAT WOULD REQUIRE LEGISLATION:

- Recommendation 3
- Recommendation 4
- Recommendation 5
- Recommendation 17
- Recommendation 18
- Recommendation 19
- Recommendation 21
- Recommendation 24
- Recommendation 26
- Recommendation 28

Goal 1: Increase Chinook abundance

Habitat restoration and acquisition: Increase Chinook abundance by restoring and acquiring salmon habitat and food sources

Recommendation 1: Significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.

- Provide capital budget funding to support the existing lists of projects and Salmon Recovery Funding Board requests intended to improve Chinook and forage fish habitat.
- Accelerate the implementation of currently funded Chinook restoration projects known to provide survival benefits to Southern Resident orcas.
- Significantly increase funding for a minimum of 10 years for high-priority actions or projects targeted to benefit Chinook stocks.
- Emphasize large-scale estuary restoration programs and prioritize grant making for restoration that increases Chinook recovery in the short term.
- To complement forest Road Maintenance and Abandonment Plans and Washington State Department of Transportation fish passage improvement efforts, continue to use a strategic approach for using Recreation and Conservation Office administered programs to remove barriers (for example, culverts and small dams) where removal would provide a high benefit to Chinook.
- Create a new funding source to support the significant increases in investments in the habitat protection and restoration programs. This should be done in conjunction with the development of a sustainable funding source for the implementation of all task force recommendations.
- The Legislature should fully fund payment in lieu of taxes to counties to compensate for the loss of revenue associated with the land that is acquired by the state for habitat protection and restoration projects.
- The Legislature should ensure adequate funding for the operations and maintenance of lands acquired by the state for habitat protection and restoration projects.
- Support a more robust monitoring and adaptive management system to better ascertain restoration project compliance and measurable ecological benefits.
- Support funding for completion of Chinook recovery plan updates for 14 of 16 remaining Puget Sound watersheds.

Implementation details:

In 2019, the governor and Legislature should fully fund the Recreation and Conservation Office's budget requests for existing capital budget salmon recovery accounts (Salmon Recovery Funding Board, Puget Sound Acquisition and Restoration Program, Estuary and Salmon Restoration

Program, the Fish Passage Barrier Removal Board and the Washington Coast Restoration and Resilience Initiative) with no changes to existing ranked lists.

In 2019, the governor and Legislature should also support programs administered by the Department of Ecology and the Department of Fish and Wildlife that directly benefit Chinook salmon, including Floodplains by Design, Puget Sound Nearshore Estuary Restoration Project, the Office of the Chehalis Basin Strategy and the Yakima Basin Integrated Plan.

Regions should work within their existing priorities that are consistent with high-priority Chinook stocks to accelerate the pace of restoration throughout the Puget Sound, Washington coast and Columbia Basin. Regions — including state natural resource agencies — should fully exercise their technical and policy capacity to accelerate full implementation of habitat restoration projects that are currently under consideration, that have an established funding source and that have feasibility studies indicating the project would provide survival benefits to salmon stocks important to the Southern Resident orcas. Consistent with restoration programs to date, projects on private lands will be limited to high priority habitat areas with willing sellers. Additional state funding should be provided for at least 10 years (five biennia) to focus specifically on high-priority actions for the stocks that most benefit Southern Residents. These programs have traditionally allocated approximately 80 percent of their funding towards projects that benefit Chinook.

When lands are acquired by state agencies for salmon and Southern Resident orca recovery, the Legislature should fully fund payment in lieu of taxes to counties to compensate for the loss of revenue associated with the land acquired by the state for habitat protection and restoration projects. Natural resource managers should be adequately funded for operations and maintenance of lands acquired. In addition, support for comprehensive and systematic evaluation of fish/habitat response/interactions to restoration actions could potentially: (1) provide further detailed information on the mechanistic links or processes that benefit the individual or population as a function of habitat restoration and (2) help prioritize future restoration actions.

Critically important but costly estuary restoration work should be evaluated and prioritized where juvenile Chinook production could be increased in the very near term. Any estuary selected for restoration should be a high-priority Chinook salmon estuary and identified as being important for the Southern Resident orcas. Possible estuaries to focus on are the Nooksack, Skagit, Stillaguamish, Elwha, Dungeness, Snohomish, Green-Duwamish, Puyallup, Nisqually, Skokomish, Snohomish, the mouth of the Columbia and Chehalis, all benefitting high-priority Chinook for Southern Residents.

To complement forest Road Maintenance and Abandonment Plans and WSDOT fish passage improvement efforts, use Recreation and Conservation Office administered programs to fund the removal of barriers (for example, culverts and small dams) where removal would provide a high benefit to Chinook. The Legislature should provide funding for barrier removal projects that already have broad support, such as the Middle Fork Nooksack and Pilchuck dams. In addition, the Governor's Salmon Recovery Office should coordinate with Washington Department of Fish

and Wildlife, the Fish Barrier Removal Board, regional salmon recovery organizations and partners to compile and develop a strategic approach to removing remaining barriers that would benefit Chinook, including those locally or privately owned, where community and technical support can be attained. A draft list of barriers shall be developed by March 2019 and provided to the task force, Governor's Office and Office of Financial Management as Phase I of this recommendation. Phase II will include further assessment of those barriers and any further steps needed for potential removal of those barriers (for example, stakeholder outreach), plus identification of any additional barriers by June 2020. This assessment should be iterative and should be revised as new information becomes available. The Legislature should provide funding via the capital budget for removal of barriers identified through this process that have community support.

Recommendation 2: Immediately fund acquisition and restoration of nearshore habitat to increase the abundance of forage fish for salmon sustenance.

- Provide funding for the immediate implementation of nearshore habitat restoration projects.

Implementation details:

The governor and Legislature should fully fund the projects by the Puget Sound Acquisition and Restoration, Washington Coast Restoration Initiative, Salmon Recovery Funding Board and Estuary and Salmon Restoration Programs that address nearshore habitat and that were approved during the 2018 grant round.

Habitat protection and enforcement: Protect habitat through improved enforcement of existing laws, strengthening laws and ensuring compliance

Recommendation 3: Apply and enforce laws that protect habitat.

- Washington Department of Fish and Wildlife, Washington Department of National Resources and Washington Department of Ecology must strongly apply and enforce existing habitat protection and water quality regulations. Provide WDFW, DNR and Ecology with the capacity for implementation and enforcement of violations.
- Direct DNR, WDFW and Ecology to identify and report to the task force before July 2019 on approaches using existing habitat, instream flow and water quality regulations to improve prey availability.
- Coordinate state and local enforcement efforts.
- Develop and adopt rules to implement and enforce the Fishway, Flow and Screening statute.
- Enhance penalties and WDFW's enforcement of the state Hydraulic Code and fish passage regulations.
- Increase prosecution of violations of state and local habitat protection and water quality regulations, including seeking to hold both property owners and contractors accountable, when appropriate.

Implementation details:

As soon as possible, the governor should direct WDFW staff to develop rules to fully implement and enforce the Fishway, Flow and Screening statute (chapter 77.57 RCW).

WDFW and Ecology should work with the Attorney General's Office and local prosecutors to increase compliance with habitat protection and water quality regulations. The number of WDFW and Ecology staff should be increased to improve implementation, compliance and civil enforcement.

The Legislature should amend WDFW's civil penalty statute (chapter 77.55.291 RCW) to provide the department with enforcement tools equivalent to those of local governments, Ecology and DNR.

Increase coordination among local governments, Ecology and WDFW in reviewing shoreline armoring proposals to better protect forage fish by advancing the Puget Sound Partnership's Shoreline Armoring Implementation Strategy.

The governor and Legislature must support and provide clear direction to Ecology, WDFW and DNR to facilitate improvements in implementation and increasing compliance to improve Southern Resident prey availability through existing habitat and water quality regulations. The agencies should report back to the task force before July 2019 on progress made. At the state level, the governor and Legislature must provide clear direction and support to facilitate change from the status quo (due to variable implementation).

Recommendation 4: Immediately strengthen protection of Chinook and forage fish habitat through legislation that amends existing statutes, agency rule making and/or agency policy.

- Strengthen legislation, agency rules, or agency internal policies, where appropriate, for Ecology and WDFW to better protect Chinook and forage fish.
- Direct WDFW to develop a plan with local governments for analyzing cumulative impacts and amend existing authority to allow WDFW to require mitigation for cumulative impacts over time under the Hydraulic Project Approval authority.
- Provide agencies with clear authority to prohibit or mitigate certain actions.

Implementation details:

Meet regularly with the Governor's Office, legislators, tribes, DNR, WDFW, Ecology, salmon recovery regional representatives and other partners and stakeholders with the goal of developing a habitat protection/regulatory reform legislative packages for the 2019 and subsequent legislative sessions and rule making.

Improve coordination of local and state permits by requiring that local shoreline permits for single-family residential bulkheads, shoreline armor or rock walls be issued prior to the issuance of an HPA by WDFW. This would be added to the HPA statute (chapter 77.55.021 RCW).

Repeal the section of the HPA statute that requires the issuance of a permit (with or without conditions) for a single-family residential bulkhead, shoreline armor or rock wall to allow WDFW to consider the full impacts of these proposals consistent with its consideration of other aquatic projects.

Direct WDFW to develop a plan with local governments for analyzing cumulative impacts of projects permitted under the HPA program and ask the Legislature to rescind or amend appropriate portions of WDFW's HPA authority (chapter 77.55.231[1] RCW) to enable the agency to require mitigation for cumulative impacts over time. This should be coupled with increased enforcement capacity.

Habitat protection: Increase incentive programs to encourage salmon habitat conservation

Recommendation 5: Develop incentives to encourage voluntary actions to protect habitat.

- State agencies should identify and implement incentives for landowners to voluntarily protect shorelines and habitats to benefit salmon and Southern Resident orcas.
- Increase funding for existing and seek to develop additional cooperative conservation programs.

Implementation details:

The Legislature and federal agencies such as the Natural Resource Conservation Service should create additional mechanisms and increase financial assistance for cooperative conservation programs (for example, fish screens, riparian areas, commodity funding for voluntary riparian implementation to Site Potential Tree Height, private fish passage upgrades and enhanced wildlife forage budget for WDFW wildlife areas with estuary restoration potential) implemented by conservation districts, lead entities, Regional Fisheries Enhancement Groups or individual landowners. Relevant existing programs include Floodplains by Design, the Shore Friendly Program, Forest Riparian Easement Program, Rivers Habitat Open Space Program and the Conservation Reserve and Enhancement Program. Salmon recovery regions and state and federal agencies should develop a 10-year funding proposal for incentives by June 2020 to complement habitat restoration and acquisition. The Legislature should allocate funding in the 2019–21 biennium for implementation in select watersheds in Puget Sound, Washington Coast and Columbia Basin.

Hatcheries: Provide additional Chinook through increased hatchery production

Recommendation 6: Significantly increase hatchery production and programs to benefit Southern Resident orcas consistent with sustainable fisheries and stock management, available habitat, recovery plans and the Endangered Species Act. Hatchery increases need

to be done in concert with significantly increased habitat protection and restoration measures.

- Authorize/provide funding for the Washington Department of Fish and Wildlife and co-managers to significantly increase hatchery production at facilities in Puget Sound, on the Washington Coast and in the Columbia River basin in a manner consistent with sustainable fisheries and stock management and the ESA. Decisions on hatchery production are made by WDFW and tribal co-managers, with Endangered Species Act consultation from the National Oceanic and Atmospheric Administration and the U.S. Fish and Wildlife Service where appropriate. The Washington Fish and Wildlife Commission adopted a policy statement in 2018 indicating support for hatchery increases of approximately 50 million smolts beyond 2018 levels to produce more Southern Resident orca prey and fisheries benefits; the task force supports significant increases in hatchery production and habitat protection and restoration.
- In 2019, undertake hatchery pilots to test and refine methods and practices (location, timing of release, age, size) that maximize production of Chinook for the benefit of Southern Resident orcas while minimizing competition with wild stocks.
- Manage the increase in hatchery production consistent with available and improved habitat to enable survival of both hatchery and wild fish stocks.
- Provide increased funding to cover the operational, infrastructure, management and monitoring costs associated with increased hatchery production.
- Conduct ongoing adaptive management, five-year comprehensive reviews and the science needed to support a sustained increase in hatchery production.

Implementation details:

To supplement 2019 hatchery production increases, fund WDFW and co-managers in fiscal year 2020 and into the future to increase hatchery production for the benefit of Southern Resident orcas at facilities in Puget Sound, on the Washington Coast and in the Columbia River basin, in a manner consistent with sustainable fisheries and stock management, state and federally adopted recovery plans and the ESA. Increased production can be assessed at appropriate state, tribal, federal or private facilities that most benefit orcas. The governor should also ask other funders – such as NOAA, USFWS, Bonneville Power Administration and the Oregon Department of Fish and Wildlife – of hatchery programs for Chinook stocks that are a priority for Southern Resident orcas to maintain or increase production levels for those stocks, so additional hatchery investments result in an overall increase in prey abundance. Increasing hatchery production will require funding for the following activities:

- Adaptive management and five-year comprehensive reviews. To continue ongoing hatchery production with funding at the increased levels, WDFW must conduct annual adaptive management and five-year comprehensive reviews and adjust production and practices accordingly to limit impacts on natural salmon stocks if the reviews provide evidence of significant risk to the recovery of natural salmon stocks. These reviews should consider stray

rates, productivity, juvenile rearing carrying capacity, density dependence, smolt-to-adult ratios, genetic fitness and other appropriate metrics to determine if action is needed to ensure the health or recovery of natural stocks. In coordination with this effort, annual and five-year reviews will evaluate the effectiveness of increased hatchery production to increase salmon available to Southern Resident orcas at times and locations determined critical to successful feeding, and to ensure effective support of fisheries management plans related to the Pacific Salmon Treaty, tribal treaty right fisheries and other plans and adjust hatchery production and practices to also maximize benefits to orcas and fisheries. Accomplishing this review will require additional state funding for WDFW and co-managers in future years (such as in years when hatchery-produced fish return to Washington waters).

- Production at the 2019 level. Although the Legislature provided funding in fiscal year 2019 to increase hatchery production with existing infrastructure, continued funding is needed to continue these production increases.
- Additional science and infrastructure to support increased production for orcas. Additional funding is needed to expand production beyond the 2019 level driven by the Southern Residents' needs. Expanding production significantly will require additional hatchery facility capacity upgrades and should use the best available science on hatchery production to adaptively manage the program to consider the factors listed above.
- Collaboration among WDFW and co-managers on hatchery production decisions.

The governor and Legislature should also provide funding to WDFW and co-managers to coordinate with NOAA and Long Live the Kings and begin testing pilot actions in hatcheries in 2019. These pilots should aim to: (1) increase marine survival of Chinook, (2) adjust return timing and locations to align with orcas' needs, (3) assess the feasibility and develop a plan to potentially increase size and age of returns and (4) reduce potential competition with wild fish. This work should build from and test findings of the Salish Sea Marine Survival Project, NOAA's salmon ocean program and other relevant efforts that are working to determine what is driving the survival of Chinook as they migrate downstream and through the marine environment. Hatchery pilots may require additional production to ensure existing production levels are not affected by these trials, which have uncertain outcomes in terms of fish survival. Pilot hatchery actions should be used to gather science to adaptively manage hatchery production levels and practices, including guiding the continued increases of hatchery production over time to provide more adult Chinook for Southern Residents, while ensuring increases are done in a manner that complies with ESA guidelines and that does not impact Chinook recovery.

Hydropower operations: Improve survival and distribution of Chinook populations

Recommendation 7: Prepare an implementation strategy to reestablish salmon runs above existing dams, increasing prey availability for Southern Resident orcas.

- Provide funding to Washington Department of Fish and Wildlife and regional salmon organizations to coordinate with partners to determine how to reestablish sustainable salmon runs above dams including, but not limited to, the Chief Joseph and Grand Coulee Dams on the Columbia River and the Tacoma Diversion, Howard Hanson and Mud Mountain dams

in the Puget Sound. Provide policy support for actions needed. Prioritize projects that produce downstream adult Chinook.

Implementation details:

In 2019, the governor and Legislature should provide funding through WDFW and regional salmon recovery organizations to coordinate with tribes, local governments, National Oceanic and Atmospheric Administration and other key partners to assess and prioritize appropriate locations based on potential benefits, costs, management, operations and other key information necessary to reestablish salmon runs as soon as possible above the dams and in the watersheds agreed to by the parties. Provide policy support for Chinook reintroduction upstream of dams such as Chief Joseph and Grand Coulee Dams for both the near-term trap-and-haul efforts (cultural releases implemented by the Upper Columbia tribes). In addition, provide policy support for the long-term phased approach in the Northwest Power and Conservation Council's Fish and Wildlife Program and support the U.S. entity's regional recommendation concerning the Columbia River Treaty. Prioritize projects that can produce downstream adult Chinook and areas with suitable habitat or areas targeted for habitat restoration in the near term.

Recommendation 8: Increase spill to benefit Chinook for Southern Residents by adjusting total dissolved gas allowances at the Snake and Columbia River dams.

- Direct the Department of Ecology to increase the standard for dissolved gas allowances from 115 percent to up to 125 percent, to allow use of the best available science to determine spill levels over these dams to benefit Chinook and other salmonids for Southern Residents.
- Coordinate with the Oregon Department of Environmental Quality to align standards across the two states.
- Maintain rigorous monitoring of impacts to juvenile Chinook and resident fish to ensure any changes in spill levels do not negatively impact salmon or other aquatic species.
- Work with tribes, salmon recovery regions, Ecology and WDFW to minimize revenue losses and impacts to other fish and wildlife program funds.

Implementation details:

Ecology should move to immediately eliminate the current 115 percent standard for the forebay of the eight dams on the lower Snake and lower Columbia rivers and adjust total dissolved gas allowances to up to 125 percent, as measured at tail races. The intent is to create flexibility to adjust spill regimes, using the best available science, to benefit Chinook salmon and other salmonids. Ecology should work as expeditiously as possible with the WDFW and Oregon Department of Environmental Quality to align at this level. Any new spill levels tested through this flexibility in spill regimes should be monitored and adaptively managed to minimize any negative effects on resident and anadromous fish species.

Recommendation 9: Establish a stakeholder process to discuss potential breaching or removal of the lower Snake River Dams for the benefit of Southern Resident orcas.

- In conjunction with the states of Idaho and Oregon, Washington should act quickly to hire a neutral third party to establish a tribal and stakeholder process for local, state, tribal and federal leaders to address issues associated with the possible breaching or removal of the four lower Snake River dams.

Implementation details:

The task force requests the creation of an open collaborative process, the purpose of which is to address a series of questions related to the potential breaching or removal of the lower Snake River dams and associated economic and social impacts and mitigation costs. These should include the potential economic impacts or benefits to coastal fishing communities, both tribal and non-tribal. This local collaborative effort should work in conjunction with the states of Washington, Idaho and Oregon to support a technically sound process.

The work should not interfere with the current Columbia River Systems Operation National Environmental Policy Act process. Washington state will continue its current active support as a cooperating agency in the NEPA process.

The state shall develop a scope of work in conjunction with the National Research Council by March 2019. This process will include engagement from local, state, tribal and federal governments, along with interested stakeholders, to begin developing a regional understanding and potential recommendations for the lower Snake River dams. The process should include consideration of services provided by the dams, potential biological benefits/impacts to Chinook and Southern Resident orcas, as well as other costs and uncertainties related to the question of breaching or retaining the lower Snake River dams.

The task force should be updated on progress by the summer of 2019.

Harvest: Increase adult Chinook abundance through reduced catch and bycatch

Recommendation 10: Support full implementation and funding of the 2019–28 Pacific Salmon Treaty.

- Washington's congressional delegation should prioritize securing appropriations to implement this treaty. Delegation members, the governor, task force members and others should advocate for these appropriations.
- The treaty and its appropriations will result in harvest reductions, reduced bycatch, increased hatchery production and investments in habitat restoration, which are crucial to reducing harvest thereby increasing Chinook for the benefit of Southern Resident orcas.

Implementation details:

Support the full implementation of the 2019–28 Pacific Salmon Treaty, with the funding components that benefit Southern Resident orcas. Elements of the renegotiations included

reductions in impacts on Chinook to make more prey available to Southern Resident orcas. Related funding elements should include investments in habitat and hatcheries to increase Chinook abundance. The governor should express the need for approval of the appropriations requests to the Washington federal delegation. Task force members should also reach out to the delegation for its support of the funding components.

Recommendation 11: Reduce Chinook bycatch in west coast commercial fisheries.

- Washington Department of Fish and Wildlife should work with regional councils and stakeholders to implement practices and regulations in west coast fisheries that further reduce bycatch of Chinook – allowing more of these Chinook to reach Southern Residents.

Implementation details:

The governor should direct WDFW representatives on the Pacific Fishery Management Council and North Pacific Fishery Management Council to work with regional stakeholders and manager starting in 2019 to avoid bycatch and further reduce the bycatch of Chinook in west coast fisheries to the extent practicable to ensure more Chinook reach Southern Residents. Discussions should take into account the effectiveness of existing bycatch reduction measures and provisions of existing federal agency requirements such as the Endangered Species Act.

Predation of Chinook: Decrease the number of adult and juvenile Chinook lost to predation by species other than Southern Residents

Recommendation 12: Direct the appropriate agencies to work with tribes and National Oceanic and Atmospheric Administration to determine if pinniped (harbor seal and sea lion) predation is a limiting factor for Chinook in Puget Sound and along Washington's outer coast and evaluate potential management actions.

- Conduct a pilot project for the removal or alteration of artificial haul out sites where sites are associated with significant outmigration and predation of Chinook smolts. Fund a study to determine if pilot removal accomplishes the goal of significantly reducing Chinook smolt predation.
- Complete ongoing regional research and coordinate an independent science panel (Washington Academy of Sciences or National Academy of Sciences) to review and evaluate research needed to determine the extent of pinniped predation on Chinook salmon in Puget Sound and Washington's outer coast. The ongoing and new work should include an assessment of factors that may exacerbate or ameliorate predation such as infrastructure haul-outs, hatchery strategies, the increased presence and impact of transient killer whales and the presence/absence of forage fish or other fish that are staple food for pinnipeds.
- Engage NOAA to determine the optimal sustainable populations of harbor seal stocks in Puget Sound.
- Convene a management panel of state, tribal and federal agencies to communicate with the independent science panel, review the results of the ongoing regional research and independent scientific review and assess appropriate management actions. Citizen

stakeholders should also be engaged in the process. If pinniped removal is identified as a management option, secure authorization through the Marine Mammal Protection Act.

- Provide funding for the science, research, coordination, decision making and, if deemed necessary, removal.

Implementation details:

In the 2019–21 biennium, the governor and Legislature should begin to fund Washington Department of Fish and Wildlife to work with tribes and NOAA to pilot the removal or alteration of artificial haul-out sites used by pinnipeds in the Puget Sound in places that may improve Chinook survival. Funding should include implementation and monitoring components to assess the effectiveness of this approach to guide potential future haul-out removals.

Starting immediately, the governor, Legislature and NOAA should support and fund the coordination and continued development of science to determine the extent of pinniped predation on Chinook salmon in Puget Sound and Washington's outer coast.

WDFW and the Puget Sound Partnership – or an appropriate board or partner designated by them – should convene a science workgroup to coordinate ongoing research and provide a comprehensive report on the state of science on pinniped predation. The comprehensive report of science should include:

- An analysis to help determine the extent to which pinniped predation is a limiting factor for Chinook survival in Puget Sound and the outer coast that should be completed by WDFW. Further, WDFW should continue to assess the status of the harbor seal and sea lion populations in these areas.
- An assessment of factors that may exacerbate or ameliorate predation, including infrastructure haul-outs, hatchery strategies, the increased presence of transient killer whales and the presence/absence of forage fish or other fish that are staple food for pinnipeds. Strive to complete the assessment in a timeframe that would help inform increases in hatchery production.
- Continue science to identify potential negative feedbacks associated with pinniped removal (using NOAA's Atlantis modeling and other efforts as needed). For example, if the consumption of Pacific hake and spiny dogfish by harbor seals declines, will the increased abundance of those fish lead to higher rates of predation by them on Chinook?
- A quantitative and spatial assessment of the consumption of harbor seals and sea lions by transient killer whales in Puget Sound and the effect of potential removals on transient populations.

WDFW and/or PSP should convene an independent science panel through the Washington Academy of Sciences or National Academy of Sciences to conduct an initial independent science review of the research program and then review the comprehensive report.

At the same time, the governor should ask NOAA to expediently complete an assessment to determine the optimal sustainable populations of the harbor seal stocks of Puget Sound and then convene the Pacific Scientific Review Group to review the assessment.

To ensure emerging science and the independent science panel review are promptly used to improve management, WDFW should expediently convene a panel of state, tribal and federal managers in 2019. The management panel will provide feedback to the science workgroup on specific information required to assess Puget Sound and outer coast pinniped predation and be updated on the state of the science. After completion of the independent science review, the management panel should examine where and what types of management actions are best suited to the situation and, if needed, provide any information necessary to secure authorization to perform needed management actions. The management panel will also ensure participation and input from stakeholders. The panel should clarify management goals and assess actions that may exacerbate or ameliorate predation, including infrastructure haul-outs, hatchery strategies, increased presence of transient killer whales and the presence/absence of forage fish or other fish that are staple food for pinnipeds. WDFW should receive state funding for coordination of this process and the governor should request the Washington federal delegation support funding capacity for NOAA to participate and review any resulting applications for management expediently. Once authorization is received for any management actions, those actions should be funded through state and federal funds.

Recommendation 13: Support authorization and other actions to more effectively manage pinniped predation of salmon in the Columbia River.

- Support efforts to enact a Columbia River-specific amendment to the Marine Mammal Protection Act enabling more effective management of pinniped (harbor seal and sea lion) predation of salmonids.
- Support MMPA authorization to add Steller sea lions to the list of pinnipeds managed in the lower Columbia River. Support increasing removal levels and altering removal requirements.
- Monitor Chinook survival and pinniped distribution in the Columbia River estuary to guide current and future management actions.
- WDFW should work with Oregon Department of Fish and Wildlife to pilot a project to remove artificial sea lion haul-out sites in the lower Columbia River and study the effectiveness of the action in reducing predation on Chinook.

Implementation details:

The governor should support efforts to amend the MMPA to more effectively manage pinniped predation of salmonids in the Columbia River through non-lethal and lethal methods. The task force should join the governor in expressing public support for a Columbia River-specific amendment to the MMPA, which is currently under consideration in Congress.

Alternatively, or in the meantime, the governor should support an application for MMPA authorization to increase effectiveness of the management program by allowing the management

of Steller sea lions, increasing removal levels and altering removal requirements. In the case of an application for MMPA authorization, the governor should request the Washington federal delegation support funding for NOAA to review the application expediently. To implement increased management through either an MMPA amendment or additional MMPA authorization, the Legislature should provide additional funding to WDFW to work with partners to carry out the program.

To monitor the effectiveness of the management program, the governor should request that NOAA provide federal funding to monitor Chinook salmon survival from the Columbia River estuary to Bonneville Dam. The governor and Legislature should provide complementary state funding for WDFW to perform pinniped distribution surveys for this same area. In combination, these two analyses will greatly help to guide current and future management actions.

Recommendation 14: Reduce populations of nonnative predatory fish species that prey upon or compete with Chinook.

- Adjust game fish regulations and remove catch and size limits on nonnative predatory fish — including, but not limited to, walleye, bass and channel catfish — to encourage removal of these predatory fish, where appropriate.
- Evaluate predatory fish reduction options in McNary reservoir as the basis for further action to protect juvenile salmon.

Implementation details:

Request WDFW remove catch and size limits on nonnative predatory fish including, but not limited to, walleye, bass and channel catfish to encourage removal of these predatory fish, where appropriate, to protect salmon or other ESA-listed species. In addition, WDFW should adapt regulations to allow the disposal of these fish species because it is currently illegal to "waste" sport fish. Any increase in fishing for these species should be managed to minimize additional mortality or bycatch of salmonids.

The governor's budget should include funding for next three years as partial funding to support the proposed study to evaluate predatory fish population reductions through McNary Dam reservoir elevation management. The study would evaluate reservoir pool elevation levels that affect nonnative predatory fish spawning.

Forage fish: Increase the food available for Chinook

Recommendation 15: Monitor forage fish populations to inform decisions on harvest and management actions that provide for sufficient feedstocks to support increased abundance of Chinook.

- Complete Puget Sound-wide surveys of herring, smelt and sand lance to map spawning habitat and determine abundance of these food sources for Chinook.
- Surveys should be conducted in conjunction with restoration and protection of forage fish spawning habitat.

- Inventory existing and planned forage fish harvest levels to determine potential impact of forage fish harvest on Chinook.
- Provide funding to conduct these surveys and inventories.

Implementation details:

The governor and Legislature should continue to provide funding for forage fish surveys to identify and map the expansion or contraction of critical habitat used by three species of forage fish in Puget Sound: herring, surf smelt and sand lance. These surveys provide the only index of abundance currently available for any species of Puget Sound forage fish by estimating the spawning biomass of more than 20 Puget Sound herring stocks. Access to quality spawning habitat is critical to the health and persistence of forage fish stocks, so the results of forage fish surveys are updated annually and made available online to inform shoreline development, protection and restoration decisions that affect these species. The studies should be conducted in coordination with existing and ongoing efforts such as the Ocean Ecosystem Indicators work by National Oceanic and Atmospheric Administration's Northwest Fisheries Science Center, the Puget Sound Ecosystem Monitoring Program and other regional ecosystem and forage fish efforts. Ongoing funding should be provided to the Washington Department of Natural Resources' Puget Sound Corps Program and to Washington Department of Fish and Wildlife to implement the surveys.

The governor should provide ongoing funding for WDFW to inventory existing and future planned forage fish harvest levels in Puget Sound and to assess impacts to Puget Sound forage fish populations important to Chinook that would result from varying levels of harvest.

Recommendation 16: Support the Puget Sound zooplankton sampling program as a Chinook and forage fish management tool.

- Monitor zooplankton to better inform forage fish and Chinook conservation. Provide funding to DNR to coordinate this critical sampling program, leveraging the work of and funding from federal, state, tribal and academic partners.

Implementation details:

The governor should fund the Puget Sound zooplankton sampling program, which leverages the work of tribal, county, state, federal (including NOAA, the U.S. Coast Guard, the U.S. Army Corp of Engineers and the Environmental Protection Agency) and academic and non-academic entities, including the Northwest Indian Fisheries Commission, to sample and analyze the zooplankton community every two weeks at 16 sites. This program is essential to better manage Chinook and forage fish populations. These data help determine the role of our restoration actions versus marine drivers of productivity and aid in the forecasting of Chinook and forage fish abundance to help make continuous management decisions for whales and fisheries. Funding should be provided through the DNR, which will be leveraged with non-state partner funds to enable the continuation of the program.

Goal 2: Decrease disturbance of and risk to Southern Resident orcas from vessels and noise, and increase their access to prey

Reduce noise from small vessels operating near Southern Resident orcas

Recommendation 17: Establish a statewide “go-slow” bubble for small vessels and commercial whale watching vessels within half a nautical mile of Southern Resident orcas.

- Enact legislation in 2019 creating a half-mile “go-slow” zone, defined as speeds of seven knots over ground or less.
- Provide for discretion in enforcement and public outreach and education as needed.
- Encourage coordination among Washington state, federal and Canadian authorities to align regulations.

Implementation details:

In the 2019 legislative session, the Washington State Legislature and governor should update chapter 77.15.740 RCW to establish a statewide “go slow” bubble for small vessels operating within a half nautical mile of Southern Resident orcas. “Go slow” is defined as 7kt speed over ground, as measured using GPS. It is intended that fish and wildlife officers and other law enforcement officers will use discretion when enforcing this section and granting exceptions for safety reasons and provide public outreach and education when they determine it is appropriate.

Recommendation 18: Establish a limited-entry whale-watching permit system for commercial whale-watching vessels and commercial kayak groups in the inland waters of Washington state to increase acoustic and physical refuge opportunities for the orcas.

- Create a limited-entry permit system to manage commercial whale-watching in the inland waters of Washington state to reduce daily and cumulative impacts on Southern Residents.
- Washington Department of Fish and Wildlife should develop the permit system in consultation with the Pacific Whale Watch Association, orca conservation organizations and other stakeholders.
- The permitting system will consider limiting commercial whale-watching activities by: (1) number of boats that receive permits, (2) hours and duration spent in the vicinity of the Southern Resident orcas and (3) location. Development of the permit system will consider limiting the total number of boats that receive permits and help codify conservative and flexible measures, such as limiting the amount of time commercial whale-watching vessels may spend in the vicinity of a particular group of whales and limiting the number of commercial whale-watching vessels that may be in the vicinity of the whales at a given time. Permitting system must be in place by July 2019, including initial limits as described above.
- Consider implementing a buy-back program.
- Require the use of the Automatic Identification System to enable effective monitoring and compliance.

- Coordinate with Canadian authorities to develop and implement the permit system across boundaries.
- Formally apply standards from the Kayak Education and Leadership Program’s “Code of Conduct” to the organized operation of kayaks and other human powered vessels near Southern Resident orcas (for example, practices such as “rafting up”).

Implementation details:

By July 2019, the Legislature and governor should establish a Washington state commercial whale-watching license for whale watching in the inland waters (exempting the ocean) to be managed by WDFW. The fees for the license should be placed in a WDFW-dedicated account that could be used for the management and enforcement of whale-watching activities.

WDFW should also develop, assess and consider alternatives that restrict the number of Washington state whale-watching licenses and implement any restrictions by May 2020.

Recommendation 19: Create an annual Orca Protection endorsement for all recreational boaters to ensure all boaters are educated on how to limit boating impacts to orcas.

- Create a \$10 statewide Orca Protection endorsement with an opt-out option for all registered recreational vessels.
- Provide education on Be Whale Wise guidelines, voluntary and regulatory measures and other information at the time the marine endorsement is purchased, so every boater has this basic information.
- Direct the resulting revenue to WDFW’s new Marine Enforcement Division, to the Washington State Department of Licensing to cover costs of administering the program and to partners doing outreach and education.
- Work with trade associations and ports and through existing government programs and channels to provide additional education to commercial and recreational boaters.

Implementation details:

Establish a \$10 endorsement on boater registration statewide to increase awareness and fund education and enforcement activities that promote recreational vessels’ compliance with best boating practices near orcas. Boaters will be able to opt out of this fee. The DOL should also note Southern Resident orca regulations and guidelines on its website.

The governor should request that the Washington State Parks and Recreation Commission, Northwest Marine Trade Association and Recreational Boating Association of Washington work with the U.S. Coast Guard and National Association of State Boating Law Administrators to require the print and online curricula, testing and outreach for the mandatory Washington State Boater Education Card: (1) include Be Whale Wise guidelines, (2) include related updates to voluntary and regulatory measures by May 2019 and (3) include broader outreach to charter boat, boat rental companies and exempted audiences from outside Washington state (particularly in Canada) and those whose lifetime certification was obtained prior to the updated standards. Look

at how to leverage Enhancing Cetacean Habitat and Observation Program's new online mariners training. Tribal governments will make their own decisions.

Recommendation 20: Increase enforcement capacity and fully enforce regulations on small vessels to provide protection to Southern Residents.

- Create a WDFW Marine Enforcement Division with four additional officer positions at WDFW focused on protection and enforcement in Puget Sound.

Implementation details:

In the 2019 legislative session, the Washington State Legislature and governor should provide proviso funding to WDFW to create at least four new fish and wildlife officer positions that will be dedicated to the goal of providing marine-based Southern Resident orca protection on every day of the whale-watching season and at other times of need. The proposed fish and wildlife officers will be based in northern Puget Sound in summer and be prepared to shift coverage southward to match the seasonal movements of Southern Residents to central Puget Sound. They will be strictly focused on protection of all marine resources when not engaged in priority Southern Resident orca protection activities (such as promoting compliance with chapter 77.15.740 RCW and any new regulations). To complement their priority Southern Resident orca protection activities on water, one or more of them will concentrate on enforcement of penalties for egregious noncompliance with regulations and develop strategies for the public to contribute photographic and video evidence of violations WDFW can pursue. Funding should be provided to WDFW to purchase an additional vessel and equipment, cover operations and maintenance and hire additional officers.

Reduce noise from the use of echo sounders near orcas

Recommendation 21: Discourage the use of echo sounders and underwater transducers within one kilometer of orcas.

- Establish a “standard of care” for small vessel operators limiting the use of echo sounders and other underwater transducers within a half nautical mile of Southern Resident orcas. Implement as a voluntary measure and provide exceptions for safe navigation.
- Conduct education and outreach.
- Consider phasing in mandatory equipment requirements and regulations.

Implementation details:

By December 2018, the Puget Sound Harbor Safety Committee should develop a “standard of care” for small vessel operators to turn off echo sounders and other underwater transducers when within a half nautical mile of orcas except when necessary for safe navigation. The adopted standard should be reported to the task force and communicated to registered vessel owners in Puget Sound counties through the Washington State Department of Licensing. The Southern Resident Orca Task Force Interagency Communicators Group should work immediately with maritime organizations with broad communications networks — such as the Northwest Marine

Trade Association, Recreational Boating Association of Washington, U.S. Coast Guard Auxiliary and Boating Squadron, Washington State Ferries, State Parks, ports, marinas, Be Whale Wise.org — to develop and implement a complementary outreach campaign for voluntary compliance. In 2019, the task force should consult with the Legislature about opportunities to phase in mandatory equipment requirements (for whale-watching vessels in the recommended limited entry permit system, for example) and initiate a formal conversation with echo sounder manufacturers and suppliers.

Reduce noise from ships and ferries near Southern Resident orcas

Recommendation 22: Implement shipping noise-reduction initiatives and monitoring programs, coordinating with Canadian and U.S. authorities.

- Create a program similar to Enhancing Cetacean Habitat and Observation for Washington state, including participation by ports, whale watching operators, private vessel operators and Tribal governments as desired.
- Coordinate with the ECHO Program on transboundary efforts to reduce noise impacts to Southern Residents. Provide funding to complete an underwater acoustic monitoring network for Puget Sound, filling in gaps — such as on South San Juan Island — and supporting acoustic and visual mapping to improve the ability to identify when and where Southern Resident orcas are present.

Implementation details:

The governor should continue to encourage strategic U.S. and Washington state collaborations with ECHO — from the U.S. Coast Guard, Washington State Ferries, Puget Sound ports, the Pacific Merchants Shipping Association, the Puget Sound Pilots, OrcaSound, Tribal co-managers and others — that continue to support parallel and adaptive implementation of ECHO and related shipping noise-reduction initiatives while promoting safe, sustainable shipping practices.

Work with the Washington Public Ports Association to create a program similar to ECHO for Washington state. Gov. Inslee and the Legislature should fund the deployment of a permanent scientific grade hydrophone on South San Juan Island and fill in other key gaps in the underwater acoustic monitoring network of Puget Sound. Gov. Inslee and the Legislature should also support advancement of acoustic and visual mapping efforts by WSF and others, with the goal to share Washington data with the Southern Resident Killer Whale Report Alert System being developed in Canada by ECHO and the Vancouver Aquarium.

Recommendation 23: Reduce noise from the Washington state ferries by accelerating the transition to quieter and more fuel-efficient vessels and implementing other strategies to reduce ferry noise when Southern Residents are present.

- Conduct a ferry fleet noise baseline study as the basis for establishing noise reduction goals and developing plans.

- Based on the results of the baseline study, institute engineered or operational strategies to safely reduce noise from ferries when Southern Residents are present.
- Provide capital funding to accelerate the transition to quieter and more fuel-efficient ferry fleet.

Implementation details:

The governor and Legislature should support and accelerate transition of the WSF fleet to quieter, more fuel-efficient designs and technologies — while funding WSF’s fleet noise baseline analysis project in 2019 — to achieve data-driven noise reduction goals.

WSF should institute engineered or operational strategies to safely reduce noise in the vicinity of the Southern Residents.

Increase protection of Southern Residents from the risk of a catastrophic oil spill

Recommendation 24: Reduce the threat of oil spills in Puget Sound to the survival of Southern Residents.

- Initiate zone-based rule making on tug escort requirements for oil laden tank vessels, including barges, more than 5,000 tons but less than 40,000 dead weight tons.
- Enact legislation disallowing any shoreline or seafloor infrastructure that would support offshore oil and gas development off the Washington coast.
- Update oil spill prevention and cleanup standards to address new types of oil and increased use of articulated tug-barges.
- Support the requirement for a stationed emergency response towing vessel (rescue tug) in a location to minimize response time in Haro Strait and other navigation lanes with the highest tank vessel traffic.

Implementation details:

Utilizing recommendations from the Department of Ecology’s Strait of Juan de Fuca and Puget Sound Vessel Traffic Safety Report (2018), the 2019 Washington State Legislature should enact legislation to reduce the risk of oil spills in Puget Sound. The legislation should: (1) initiate zone-based rule making on tug escort requirements for oil laden tank vessels, including barges, more than 5,000 tons but less than 40,000 dead weight tons, including oil barges and articulated tug-barges, (2) support the requirement for a stationed emergency response towing vessel (rescue tug) in a location to minimize response time in Haro Strait and other navigation lanes with the highest tank vessel traffic and (3) require updated oil spill prevention and cleanup standards to address new types of oil (for example, diluted bitumen) and increased shipments by articulated tug-barges. The governor should meet with Canadian officials and seek involvement from the U.S. Coast Guard and the joint meetings of the Puget Sound Harbor Safety Committee and Canadian Pacific Coast Marine Advisory Review Panel and Navigation Aids and Navigation Services. The governor should direct Ecology and Washington Department of Fish and Wildlife to engage in

Canadian environmental assessments of project-related shipping's cumulative effects on Southern Resident orcas (such as Roberts Bank Terminal 2).

Formalize or extend vessel protections for Southern Resident orcas

Recommendation 25: Coordinate with the Navy in 2019 to discuss reduction of noise and disturbance affecting Southern Resident orcas from military exercises and Navy aircraft.

- The U.S. Navy was not among the organizations that were initially asked to participate in the Vessels working group during Year One. However, early in the task force process several task force members and the full Vessels working group indicated the need for direct engagement with the Navy in Year Two, which was reinforced in hundreds of public comments on the draft report.

Implementation details:

The governor should meet with the U.S. Navy's Commanding Officer for the region that includes Washington state to address the acoustic and physical impacts to Southern Resident orcas from Naval exercises in waters and air of Washington state. The governor should request the Navy participate on the Vessels working group in Year Two and identify actions to reduce the Navy's impacts to Southern Resident orcas.

Recommendation 26: Revise chapter 77.15.740 RCW to increase the buffer to 400 yards behind the orcas.

- The guidelines of the Pacific Whale Watch Association include this voluntary standard.
- By limiting the distance at which vessels can approach from behind (and their speed), the intent is to decrease the occurrence of chase-like situations that may adversely affect Southern Resident orcas.
- Encourage coordination among Washington state, federal and Canadian authorities to align regulations, which will foster clear communication and increase compliance.

Recommendation 27: Determine how permit applications in Washington state that could increase traffic and vessel impacts could be required to explicitly address potential impacts to orcas.

- State agencies should study potential requirements for relevant permit applications to explicitly address potential impacts to Southern Resident orcas and treat underwater noise as a "primary constituent element" of critical habitat and report to the task force by 2019.
- Coordinate with local governments and tribes and increase transboundary coordination with Canada.

Implementation details:

The governor should direct Ecology and request that DNR and WDFW work with the Governor's Office for Regulatory Innovation and Assistance to determine how applicable current and future permit applications in Washington state that could increase vessel traffic and vessel

impacts (risk of oil spills, increased noise, threat of ship strikes) could be required to explicitly address potential impacts to Southern Resident orcas and treat underwater noise as a “primary constituent element” of critical habitat. This work must coordinate with local governments, tribes and others to identify authorities to issue permits, authorizations or mitigation measures related to any projects, and must increase transboundary coordination to address impacts from projects initiating in Canada (such as Roberts Bank Terminal 2). The agencies should report to the task force by April 2019.

Potential avenues for adding these requirements include:

- Updating the State Environmental Protection Act checklist.
- Updating the Joint Aquatic Resources Permit Application form.
- Updating the Prevention of Significant Deterioration Permit to Construct to specifically include potential vessel traffic impacts to Southern Resident orcas.
- Updating state regulations and Ecology’s Shoreline Master Program Handbook to address vessel traffic impacts and require Southern Resident orca expertise for all state application submittals.

Recommendation 28: Suspend viewing of Southern Resident orcas

- Establish a whale watching regulation that precludes Southern Resident orca viewing by all boats in Puget Sound for the next three to five years. The governor should direct WDFW to begin rule making to define Washington whale watching in coordination with the commercial whale watching industry, kayak industry, local governments and interested nongovernment organizations.
- Report back to governor and Legislature after three to five years on the effectiveness of the suspension.

Goal 3: Reduce the exposure of Southern Resident orcas and their prey to contaminants

Prevent further use and release of toxics that could harm orcas and their prey

Recommendation 29: Accelerate the implementation of the ban on polychlorinated biphenyls in state-purchased products and make information available online for other purchasers.

- Direct the Department of Enterprise Services to accelerate implementation of the ban, enacted by the Legislature in 2014, on PCBs in products purchased by the state.
- This law includes a provision for suppliers to provide information on PCBs in products to the state, which should be shared publicly to facilitate PCB-free purchasing by other entities.

Implementation details:

The Department of Enterprise Services should immediately accelerate implementation of the ban on PCBs in state-purchased products and make information about PCB levels in state-purchased products and packaging available online to the public so other purchasers can access this information and make informed purchasing decisions.

Washington state adopted a procurement law in 2014 that states: “no agency may knowingly purchase products or products in packaging containing polychlorinated biphenyls above the practical quantification limit except when it is not cost-effective or technically feasible to do so” (chapter 39.26.280 RCW). Implementation of this law should be accelerated to reduce PCBs entering Puget Sound from products such as paints, hatchery fish feed, adhesives, electrical equipment, caulking, paper products and lubricants. Product suppliers to the state will provide information about PCBs in their products and this information can be shared with other purchasers that want to avoid products containing PCBs.

Recommendation 30: Identify, prioritize and take action on chemicals that impact orcas and their prey.

- By March 2019, the Department of Ecology should develop a prioritized list of chemicals of emerging concern that threaten the health of orcas and their prey and pursue policy and/or budget requests in the 2019 legislative session to prevent the use and release of chemicals of emerging concern² into Puget Sound.
- Direct Ecology to convene discussions and develop a plan to address pharmaceuticals, identifying priorities, source control and wastewater treatment methods.
- Periodically review and update toxicological information as new science emerges and adaptively manage plans and programs.

Implementation details:

Ecology should develop a prioritized list of the chemicals of emerging concern based on greatest benefit to Southern Resident orcas and their prey if action is taken. Ecology, with input and review from regional experts, including Washington Department of Fish and Wildlife and National Oceanic and Atmospheric Administration, should begin this prioritization process in 2018 and complete the list in March 2019.

It is important to note toxicological information is limited on many chemicals of emerging concern. This list will need to be periodically revisited to ensure new chemicals and new research findings are incorporated into our efforts to decrease chemical exposure to Southern Residents and their prey.

² The following groups of chemicals were identified as potentially important (in no particular order): flame retardants, per- and polyfluoroalkyl substances, phthalates, bisphenols, nonylphenols, medications, pesticides and chemical(s) in tires.

Ecology should develop a plan and pursue agency request legislation and/or budget requests in the 2019 legislative session to address control of those chemicals of emerging concern based on greatest benefit to Southern Resident orcas and their prey if action is taken (informed by the prioritized list). This legislative request should include funding to implement existing policies as well as identify new policies and actions to decrease the load of priority chemicals of emerging concern to Puget Sound (for example, phaseouts, disclosure, assessment of safer alternatives and enhanced treatment). Given pharmaceuticals require a different control mechanism, Ecology should convene discussions about priority pharmaceuticals, source control and wastewater treatment options. The plan will identify the most effective actions to decrease loading of priority chemicals of emerging concern* to Puget Sound and will be completed by 2025.

Accelerate removal and clean-up of legacy sources of toxics harmful to orcas and their prey

Recommendation 31: Reduce stormwater threats and accelerate clean-up of toxics harmful to orcas.

- Provide funding to accelerate the clean-up and removal of legacy sources of polychlorinated biphenyls or PCBs, polycyclic aromatic hydrocarbons or PAHs, polybrominated diphenyl ether or PBDEs and per and polyfluoroalkyl substances present in Puget Sound.
- Prioritize and fund clean-up actions likely to have the greatest benefit to Southern Resident orcas.
- Identify toxic hotspots in the stormwater entering Puget Sound. Prioritize these for retrofits and/or redevelopment to meet current standards.
- Increase funding for the Stormwater Financial Assistance Program to incentivize immediate and accelerated retrofits and other source control actions.
- Prioritize and accelerate sediment remediation, nearshore restoration and clean-up of hotspots in forage fish and Chinook rearing habitats based on risk to Southern Resident orcas.

Implementation details:

The Legislature should fund the Department of Ecology in 2019 for a program that incentivizes the accelerated removal of primary legacy sources of PCBs, PAHs, PBDEs and per and polyfluoroalkyl substances present in the built environment in the central Puget Sound. In Phase I, Ecology should develop the program, to include: (1) prioritizing those legacy chemicals likely to have greatest impact on Southern Resident orcas, (2) coordinating with ongoing programs, (3) gathering stakeholder input and (4) undertaking targeted communications and outreach. In Phase II, the incentive program will be implemented.

Ecology should reduce stormwater threats in existing hotspots as soon as possible. In 2018-19, Ecology, in consultation with regional experts, should identify toxic stormwater hotspots and prioritize them for source control, stormwater retrofits and/or redevelopment projects to meet today's standards. Ecology should seek new funding in the 2019 Legislature through the

Stormwater Financial Assistance Program to incentivize stormwater retrofits and source control to achieve goals faster. Programs such as the Stormwater Financial Assistance Program, retrofits through the Washington State Department of Transportation and federal funding through the Clean Water State Revolving Fund are in place to support this effort but they need substantially increased funding to increase the pace and provide the necessary pollutant removal.

Ecology and the Washington State Department of Natural Resources should immediately prioritize and accelerate sediment remediation and nearshore restoration and clean-up of hotspots in forage fish and juvenile Chinook rearing habitat in sensitive areas where toxics are known to impact prey survival. All prioritized cleanup actions should ensure “upstream” source control is also addressed. During the prioritization process, Ecology should coordinate with other agencies such as the Washington Department of Fish and Wildlife, Puget Sound Partnership and the National Oceanic Atmospheric Administration. Previously identified hotspots include the Duwamish Estuary and river, Commencement Bay, Hanford Reach, Sinclair and Dyes Inlets and Lake Union.

Improve pollution permitting and management to reduce contaminant exposure of orcas and their prey

Recommendation 32: Improve effectiveness, implementation and enforcement of National Pollutant Discharge Elimination System permits to address direct threats to Southern Resident orcas and their prey.

- Update aquatic life water quality standards focused on pollutants most harmful to Southern Residents and their prey.
- Direct the Department of Ecology to consider developing stronger pre-treatment standards for municipal and industrial wastewater discharges under NPDES.
- Provide funding for Ecology to increase inspections, assistance programs and enforcement to achieve water quality standards. Prioritize enforcement where limits are exceeded for pollutants known to be harmful to Southern Resident orcas.

Implementation details:

Ecology should report in 2019 on how to accelerate effectiveness, implementation and enforcement of NPDES permits. Using the existing regulatory framework and authority under the Clean Water Act and Water Pollution Control Act, Ecology should update aquatic life water quality standards focused on pollutants most harmful to Southern Resident orcas and their prey. To fill gaps, this will focus primarily on PBDEs, contaminants of emerging concern³ and other chemicals based on greatest benefit to Southern Resident orcas and their prey. In addition,

³ The following groups of chemicals were identified as potentially important (in no particular order): flame retardants, per- and polyfluoroalkyl substances, phthalates, bisphenols, nonylphenols, medications, pesticides and chemical(s) in tires.

Ecology should consider developing stronger pre-treatment standards for municipal and industrial wastewater dischargers under NPDES.

Improved permit requirements would also result in increased innovation and source control for permitted dischargers and drive improved technology requirements under the existing “best available technology” standard. For municipal wastewater facilities this would combine improved industrial pretreatment and deployment of improved treatment technologies with already planned or required upgrades to wastewater treatment facilities. New standards could be implemented through renewals of the five-year NPDES permit cycle and could allow permittees the necessary time to fully implement solutions (ideally within one permit cycle).

To ensure new and existing NPDES permit conditions and water quality standards are met, Ecology should seek funding in the 2019 legislative session to conduct more robust inspections, assistance programs and enforcement. This funding should support field staff and data analysis and should include a clear directive to increase enforcement against entities that exceed limits for pollutants known to cause harm to the Southern Resident orcas and their prey.

Recommendation 33: Increase monitoring of toxic substances in marine waters; create and deploy adaptive management strategies to reduce threats to orcas and their prey.

- Expand and better coordinate existing toxic monitoring programs in Puget Sound focused on chemicals harmful to the Southern Resident orcas.
- Fund the development and implementation of a program to study and monitor the impact of CECs on Southern Resident orcas.

Implementation details:

The Legislature should fund Ecology, the Washington Department of Fish and Wildlife and the Puget Sound Ecosystem Monitoring Program managed by PSP, to expand and coordinate existing monitoring and new science programs in 2019. Funding is needed immediately to develop and support a robust toxic monitoring program as well as to conduct new science to understand the effects of CEC exposure on Southern Resident orcas, their prey and other species in the lower trophic levels. This funding is critical to gain a more comprehensive understanding of CECs; to collect data to address critical uncertainties; to evaluate the impact of CECs on Southern Resident orcas to prioritize cleanups, phase outs and bans; to document whether the actions taken are effective; and to make changes to implemented actions/strategies if the data demonstrates no impact.

The task force requested that in Year Two, the Contaminants working group look at issues associated with nutrient loading and water quality, as well as available ongoing work that is examining links between specific contaminants and health and reproductive challenges for the orcas.

Goal 4: Ensure funding, information and accountability mechanisms are in place to support effective implementation

Provide sustainable funding

Recommendation 34: Provide sustainable funding for implementation of all recommendations.

- Provide immediate capital and operating funds in the 2019-21 biennium budget to implement near-term high-priority actions.
- Request that the governor and Legislature establish a sustainable, durable funding source to implement these recommendations and meet needs as they arise.
- Include funding to state agencies for staffing, research and ongoing management needed to initiate and implement task force recommendations.

Conduct research, science and monitoring to enable adaptive management

Recommendation 35: Conduct research, science and monitoring to inform decision making, adaptive management and implementation of actions to recover Southern Residents.

- Request that National Oceanic and Atmospheric Administration Northwest Fisheries Science Center model the task force's Year One recommendations related to the three major threats to determine the degree of benefit to Southern Resident orcas that the recommended actions may produce under a reasonable range of future growth and development scenarios.
- Request that the zooplankton monitoring team engage with the Puget Sound Ecosystem Monitoring Program and the Department of Ecology to look at impacts associated with nutrient pollution.
- Request that the Regional Response Team and the Northwest Area Committee assess the connections to and impacts of oil spills on plankton.
- It will be important to use an adaptive management approach to track effectiveness of implemented recommendations, look for unintended consequences, monitor ongoing ecosystem change and adjust future investments based on our findings.

Track progress and address gaps in Year Two

Recommendation 36: Monitor progress of implementation and identify needed enhancements.

- Agencies shall report to the governor and the task force on progress implementing recommendations by May 1, 2019. These reports are to address progress, shortcomings, issues, barriers and gaps associated with initial implementation.
- The task force will identify changes needed, any new ideas and other actions needed to recover Southern Resident orcas.

Overview of recommendations

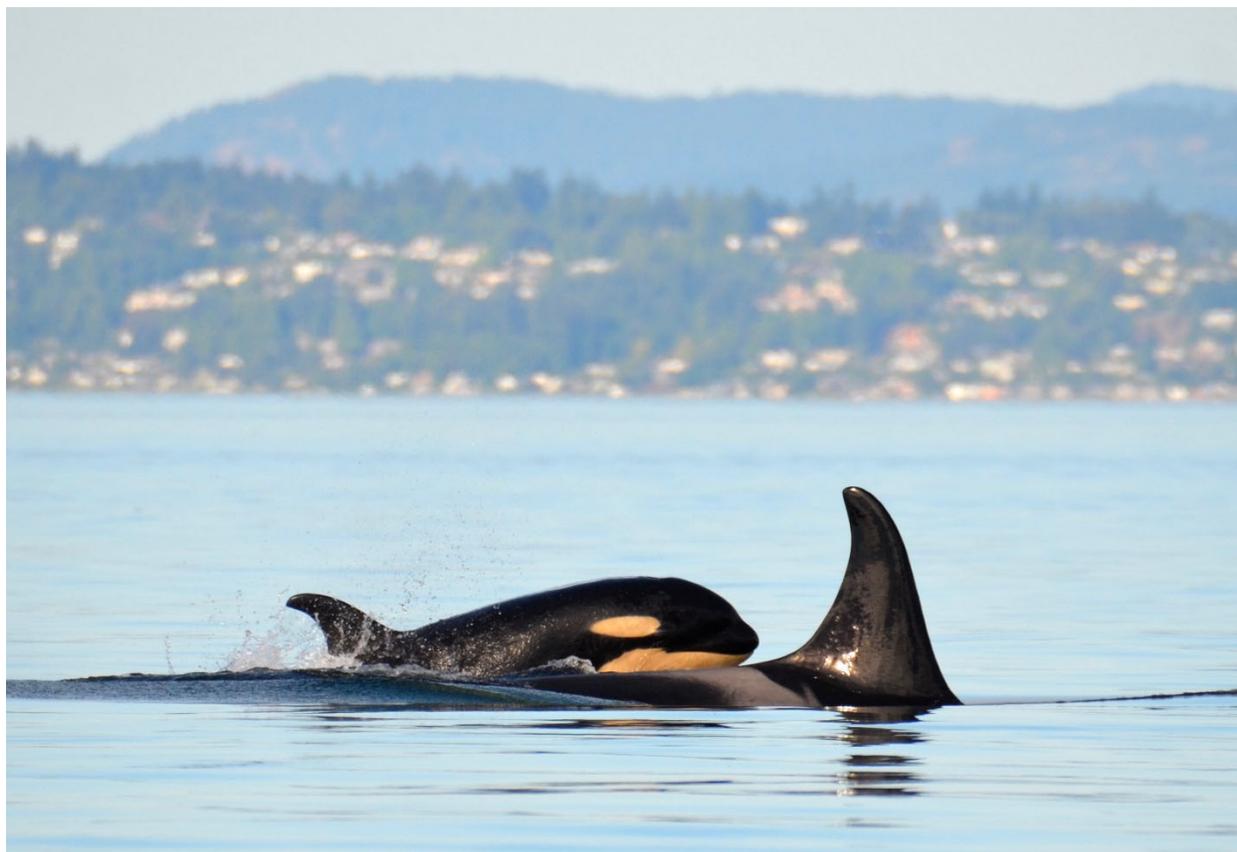
The Office of Financial Management is working with state agencies to develop budget estimates for implementation of each recommendation. An estimated cost for implementation in the next biennium will be released in December.

Recommendation	Lead	Key partners	Requires state, federal, or local action or decision
Recommendation 1: Significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.	Recreation and Conservation Office	Washington Department of Fish and Wildlife, Puget Sound Partnership, Washington State Department of Transportation, regional salmon organizations, tribes	Federal and state
Recommendation 2: Immediately fund acquisition and restoration of nearshore habitat to increase the abundance of forage fish for salmon sustenance.	RCO	WDFW, PSP, regional salmon organizations, tribes	Federal and state
Recommendation 3: Apply and enforce laws that protect habitat.	WDFW, DNR, Washington Department of Ecology	Attorney General’s Office, local governments, PSP, tribes	State and local
Recommendation 4: Immediately strengthen protection of Chinook and forage fish habitat through legislation that amends existing statutes, agency rule making and/or agency policy.	WDFW, Ecology	PSP, DNR, regional salmon organizations, local governments, tribes, interested non-governmental organizations	State
Recommendation 5: Develop incentives to encourage voluntary actions to protect habitat.	Conservation Commission, Natural Resource Conservation Service	Washington Association of Conservation Districts, RCO, WDFW	Federal and state
Recommendation 6: Significantly increase hatchery production and programs to benefit Southern Resident orcas consistent with sustainable fisheries and stock management, available habitat, recovery plans and the Endangered Species Act. Hatchery increases need to be done in concert with significantly increased habitat protection and restoration measures.	WDFW, tribes	NOAA, regional salmon organizations, Oregon Department of Fish and Wildlife	State, with federal review
Recommendation 7: Prepare an implementation strategy to reestablish salmon runs above existing dams, increasing prey availability for Southern Resident orcas.	WDFW, regional salmon organizations	Tribes, local governments, NOAA, RCO, Canada	State, with federal review
Recommendation 8: Increase spill to benefit Chinook for Southern Residents by adjusting Total Dissolved Gas allowances at the Snake and Columbia River dams.	Ecology	WDFW, NOAA, Oregon Department of Environmental Quality, ODFW, Bonneville Power Administration	State, with federal review

Recommendation	Lead	Key partners	Requires state, federal, or local action or decision
Recommendation 9: Establish a stakeholder process to discuss potential breaching or removal of the Lower Snake River Dams for the benefit of Southern Resident orcas.	Washington state, with Idaho and Oregon	WDFW, NOAA, BPA, regional salmon organizations, local communities, stakeholders, independent scientists, interested non-governmental organizations	State and federal
Recommendation 10: Support full implementation and funding of the 2019-28 Pacific Salmon Treaty.	WDFW	Canada, Alaska, NOAA, tribes	Federal
Recommendation 11: Reduce Chinook bycatch in west coast commercial fisheries.	WDFW	Pacific Fishery Management Council, North Pacific Fishery Management Council, regional stakeholders	State and federal
Recommendation 12: Direct the appropriate agencies to work with tribes and National Oceanic and Atmospheric Administration to determine if pinniped (harbor seal and sea lion) predation is a limiting factor for Chinook in Puget Sound and along Washington’s outer coast and evaluate potential management actions.	WDFW	Tribes, NOAA, PSP, independent scientists, interested non-governmental organizations	State and federal
Recommendation 13: Support authorization and other actions to more effectively manage pinniped predation of salmon in the Columbia River.	WDFW	Tribes, NOAA, ODFW, Idaho Department of Fish and Game, US Army Corps of Engineers, interested non-governmental organizations	Federal and state
Recommendation 14: Reduce populations of nonnative predatory fish species that prey upon or compete with Chinook.	WDFW	ODFW, BPA, US Army Corps of Engineers, independent scientists, angler community, tribes	State
Recommendation 15: Monitor forage fish populations to inform decisions on harvest and management actions that provide for sufficient feedstocks to support increased abundance of Chinook.	DNR, WDFW	NOAA, PSP, independent scientists, interested non-governmental organizations, tribes	State
Recommendation 16: Support the Puget Sound zooplankton sampling program as a Chinook and forage fish management tool.	DNR	WDFW, interested non-governmental organizations	State
Recommendation 17: Establish a statewide “go-slow” bubble for small vessels and commercial whale watching vessels within half a nautical mile of Southern Resident orcas.	WDFW	US Coast Guard, San Juan County, local governments, interested non-governmental organizations	State
Recommendation 18: Establish a limited-entry whale-watching permit system for commercial whale-watching vessels and commercial kayak groups in the inland waters of Washington state to increase acoustic and physical refuge opportunities for the orcas.	WDFW	Pacific Whale Watch Association, commercial kayak groups, San Juan County, Canada	State

Recommendation	Lead	Key partners	Requires state, federal, or local action or decision
Recommendation 19: Create an annual Orca Protection endorsement for all recreational boaters to ensure all boaters are educated on how to limit boating impacts to orcas.	WDFW	Department of Licensing, State Parks, USCG, Northwest Marine Trade Association, Recreational Boating Association of Washington	State
Recommendation 20: Increase enforcement capacity and fully enforce regulations on small vessels to provide protection to Southern Residents.	WDFW	State Parks	State
Recommendation 21: Discourage the use of echo sounders and underwater transducers within one kilometer of orcas.	Puget Sound Harbor Safety Committee	PSP, DOL, WDFW, NOAA, NMTA, RBAW, USCG, Washington State Ferries, State Parks, ports, marinas, BeWhaleWise.org, Canada	N/A
Recommendation 22: Implement shipping noise-reduction initiatives and monitoring programs, coordinating with Canadian and U.S. authorities.	Washington Public Ports Association, Northwest Seaport Alliance	USCG, WSF, Commerce, Pacific Merchants Shipping Association, Puget Sound Pilots, OrcaSound, tribes, ECHO (Port of Vancouver), Vancouver Aquarium, Canada	N/A
Recommendation 23: Reduce noise from the Washington state ferries by accelerating the transition to quieter and more fuel-efficient vessels and implementing other strategies to reduce ferry noise when Southern Residents are present.	WSF		State
Recommendation 24: Reduce the threat of oil spills in Puget Sound to the survival of Southern Residents.	Ecology, WDFW	USCG, Puget Sound Harbor Safety Committee, Canadian Pacific Coast Marine Advisory Review Panel, Transport Canada, PSP	State with federal review
Recommendation 25: Coordinate with the Navy in 2019 to discuss reduction of noise and disturbance affecting Southern Resident orcas from military exercises and Navy aircraft.	Governor's Office, PSP	US Navy, Vessels working group	State and federal group
Recommendation 26: Revise chapter 77.15.740 RCW to increase the buffer to 400 yards behind the orcas.	WDFW	NOAA, interested non-governmental organizations	State
Recommendation 27: Determine how permit applications in Washington state that could increase traffic and vessel impacts could be required to explicitly address potential impacts to orcas.	Governor's Office of Regulatory Innovation and Assistance	Ecology, DNR, WDFW, interested non-governmental organizations	State
Recommendation 28: Suspend viewing of Southern Resident orcas.	WDFW	PWWA, kayak industry, local governments and interested non-governmental organizations, State Parks, NOAA, USCG, Canada	State
Recommendation 29: Accelerate the implementation of the ban on polychlorinated biphenyls in state purchased products and make information available online for other purchasers.	Department of Enterprise Services		State

Recommendation	Lead	Key partners	Requires state, federal, or local action or decision
Recommendation 30: Identify, prioritize and take action on chemicals that impact orcas and their prey.	Ecology	Affected stakeholders, NOAA, WDFW	State
Recommendation 31: Reduce stormwater threats and accelerate clean-up of toxics that are harmful to orcas.	Ecology	Local governments, private landowners	State and local
Recommendation 32: Improve effectiveness, implementation and enforcement of National Pollutant Discharge Elimination System permits to address direct threats to Southern Resident orcas and their prey.	Ecology	Local governments, affected stakeholders	State and local
Recommendation 33: Increase monitoring of toxic substances in marine waters; create and deploy adaptive management strategies to reduce threats to orcas and their prey.	Ecology, WDFW	PSP, local governments	State and local
Recommendation 34: Provide sustainable funding for implementation of all recommendations.	Legislature	Congress, local governments, private sector, foundations	State, federal, and local
Recommendation 35: Conduct research, science and monitoring to inform decision making, adaptive management and implementation of actions to recover Southern Residents.	Multiple agencies	Tribes, NOAA, PSP, independent scientists, interested non-governmental organizations	State and federal
Recommendation 36: Monitor progress of implementation and identify needed enhancements.	All agencies responsible for recommendations above; Task Force	Working groups	State



Next steps for the task force

The task force will continue its work in 2019. The executive order charges the task force with producing a second report outlining the progress made, lessons learned and outstanding needs by October 1, 2019; that will conclude the work of this task force.

The task force hopes that through the recommendations in this report, we can make significant, immediate progress toward our goal of consistently well-nourished whales and the survival of several thriving young orcas in the near term. In 2019, the task force will work to refine additional recommendations to ensure the state is on a clear path to working with partners and across boundaries to ensure a self-sustaining and resilient population of Southern Resident orcas for many generations to come.

Abbreviations

CEC	Contaminants of emerging concern
DDT	Dichloro-diphenyl-trichloroethane
DOL	Washington State Department of Licensing
ECHO	Enhancing Cetacean Habitat and Observation Program
EPA	Environmental Protection Agency
ESA	Endangered Species Act
GSRO	Governor's Salmon Recovery Office
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWFSC	Northwest Fisheries Science Center
OFM	Office of Financial Management
PAH	Polycyclic aromatic hydrocarbons
PBDE	Polybrominated diphenyl ether
PCB	Polychlorinated biphenyl
PFAS	Per- and polyfluoroalkyl substances
PMFC	Pacific Fishery Management Council
PSP	Puget Sound Partnership
RCO	Recreation and Conservation Office
RCW	Revised Code of Washington
SRKW	Southern Resident Killer Whale
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife
WSDOT	Washington State Department of Transportation
WSF	Washington State Ferries

Appendix 1. Executive order

Executive order 18-02

Southern Resident Killer Whale Recovery and Task Force

WHEREAS, Southern Resident Killer Whales (Southern Residents) are an iconic and treasured species in Washington and throughout the Pacific Northwest;

WHEREAS, Southern Residents are classified as endangered in Washington and surrounding waters, under the U.S. Endangered Species Act and in Canada under the Species at Risk Act;

WHEREAS, the population of Southern Residents has declined, from a high of 98 in 1995, to 76 today, which is the lowest number of Southern Residents in more than three decades. Recent science also indicates that many Southern Residents are in poor condition and are struggling to raise calves;

WHEREAS, if Southern Residents were to become extinct, we would suffer an unacceptable loss to our environment, economy, and way of life. We would also lose an essential component of our marine ecosystem and an indicator of the health of our waters;

WHEREAS, Southern Residents hold significant cultural value to native tribes and all Washingtonians;

WHEREAS, Southern Residents, through the whale watching industry alone, contribute as much as \$60 million to the local economy annually and provide hundreds of jobs to the Puget Sound region;

WHEREAS, Southern Residents make their home in Washington's marine waters for a portion of the year, but they are also highly migratory seeking prey along the west coast from Northern California to Southeast Alaska. Therefore, Southern Residents rely on healthy ecosystems and food sources from Washington and throughout the west coast of the United States and Canada;

WHEREAS, three primary factors threaten Southern Resident populations: (1) prey availability, (2) legacy and new toxic contaminants, and (3) disturbance from noise and vessel traffic. The health of Southern Residents and Chinook salmon are tightly linked. Recent scientific studies indicate that reduced Chinook salmon runs undermine the potential for the Southern Resident population to successfully reproduce and recover. Both Southern Residents and Chinook salmon populations are adversely impacted by warming oceans and ocean acidification due to climate change. Presence of contaminants and accumulation of pollutants in Washington's waters are also linked to the decline of Southern Residents. Key sources of contamination in storm water runoff remain to be addressed and the potential for a catastrophic oil spill continues to threaten Southern Residents and the entire ecosystem of Puget Sound. In addition, increased boat and ship traffic has caused greater underwater noise that interferes with Southern Resident critical feeding and communication;

WHEREAS, both swift near-term actions and effective long-term actions are necessary to recover these iconic and endangered animals. Essential recovery actions that are described in both United States and Canadian federal plans and federally approved regional plans must be implemented through close coordination with all of our partners including state, local, tribal, and Canadian governmental entities and other private sector partners to be successful;

NOW THEREFORE, I, Jay Inslee, Governor of the state of Washington, by virtue of the power vested in me by the Constitution and statutes of the state of Washington do hereby order and direct as follows:

Implement Immediate Actions to Benefit Southern Resident Killer Whales

Within existing resources, I ask the following state agencies, in consultation with the appropriate local governments, federal agencies, and tribal governments, to conduct the immediate actions listed below to further the purpose of this Executive Order.

- Washington Department of Fish and Wildlife (WDFW) with review from the Governor’s Salmon Recovery Office (GSRO) and the Puget Sound Partnership (PSP)—By July 31, 2018, identify the highest priority areas and watersheds for Southern Resident prey in order to focus or adjust, as needed, restoration, protection, incentives, hatcheries, harvest levels, and passage policies and programs.
- WDFW and Washington State Parks and Recreation Commission (WSPRC)—By April 30, 2018, develop implementation plans for increased enforcement, outreach and education of vessel regulations as well as enforcement of Chinook fisheries regulations in areas frequented by orcas.
- Washington State Department of Ecology (Ecology)—By April 30, 2018, create a curriculum to improve and increase the number of trainings for vessels in the whale watching industry to become “vessels of opportunity” to assist in the event of an oil spill.
- Washington State Department of Transportation (WSDOT)—By May 31, 2018, develop strategies for quieting state ferries in areas most important to Southern Residents.
- WDFW—By April 30, 2018, review and amend, as needed, 2018 recreational and commercial fishing regulations prioritizing protection of key areas and fish runs for Southern Resident recovery. I will also ask our tribal co-managers, and international and federal fisheries managers to work directly with WDFW and its Commission in developing recommendations for implementing this action.
- WDFW—By April 30, 2018, explore options and develop a proposal to alter fish food used in state hatcheries to limit the amount of Polychlorinated Biphenyls (PCBs) in Southern Resident prey.
- PSP, WDFW, GSRO—By December 15, 2018, demonstrate how Chinook recovery projects benefit Southern Resident recovery, beginning in the 2018 grant round, for the Pacific Coast Salmon Recovery Fund, the Puget Sound Acquisition and Restoration Program, the Estuary and Salmon Restoration program and the Washington Coastal Restoration Initiative.

- PSP, WDFW, GSRO, WSPRC, Washington State Department of Licensing (DOL)—By July 1, 2018, prioritize existing outreach resources to support Southern Resident recovery. Collaborate with the Governor’s Office to develop a public education program and identify needed resources.
- Ecology—By July 31, 2018, develop criteria to prioritize financial assistance beginning in the 2019-21 biennium for storm water projects that benefit Southern Resident recovery.

Establishment of the Southern Resident Killer Whale Task Force

A Southern Resident Killer Whale Task Force is hereby created to identify, prioritize, and support the implementation of a longer term action plan needed for the recovery of Southern Residents and necessary to secure a healthy and sustained population for the future. The plan shall include actions needed to make significant progress in addressing all three of the identified threats to Southern Residents. The Task Force should monitor and evaluate the immediate actions undertaken by state agencies and build upon the progress and effectiveness of that work when developing longer term actions. Where available and applicable, the Task Force should build upon existing state, regional and federal plans.

Members of the Task Force will include directors or their senior designees from the Washington Departments of Agriculture, Commerce, Ecology, Health, and Transportation, as well as the Puget Sound Partnership, the Governor’s Office of Indian Affairs, the Recreation and Conservation Office, and the Governor’s Salmon Recovery Office. I also invite the Department of Fish & Wildlife and its Commission, the Department of Natural Resources, and the Washington State Parks and Recreation Commission to participate on the Task Force as members in full.

I will separately invite representatives of appropriate federal, tribal, and local governments, the private sector and the nonprofit sector, to participate in the Task Force. I will invite each Washington legislative caucus to appoint a member to participate in the Task Force.

I shall appoint co-chairs and convene the Southern Resident Killer Whale Task Force (Task Force) beginning in April 2018.

The Task Force shall work with all levels of government and other partners to identify needed policies and programs, recommend priority actions to support recovery efforts, highlight budget needs, and recommend any legislation needed to support this Executive Order. The Task Force shall coordinate their work with appropriate representatives of the Government of Canada, the Province of British Columbia, and the states of Oregon, California, Idaho, and Alaska.

The Task Force shall prepare a comprehensive report and recommendations for recovering Southern Residents, with a full draft due by October 1, 2018, and a final report by November 1, 2018. The report should detail ongoing and new actions that will address all of the major threats to Southern Residents, including prey availability, legacy and ongoing toxic contaminants, and disturbance from noise and vessel traffic. A second report outlining the progress made, lessons learned, and outstanding needs shall be completed by October 1, 2019. With the submission of its second report, the Task Force shall dissolve.

I direct the Puget Sound Partnership and ask the Department of Fish and Wildlife to organize the necessary agency experts and staff to support the work of the Task Force.

The Governor's Policy Office and the Office of Financial Management will provide assistance and guidance to the lead agencies as needed to ensure the success of the Task Force.

The Governor's Office will work with both the State Legislature and State Congressional delegation to solicit their early and ongoing advice and guidance.

The Southern Resident Killer Whale Task Force shall conduct its business in an open, transparent manner, and its meetings will be open to the public.

Signed and sealed with the official seal of the state of Washington on this 14th day of March, 2018, at Olympia, Washington.

By:

/s/_____

Jay Inslee
Governor

BY THE GOVERNOR:

/s/_____

Secretary of State

Appendix 2. Task force and working group members

Task force members

Member Name	Organization / Affiliation
Amy Scarton	Washington State Department of Transportation
Amy Windrope	Washington State Department of Fish and Wildlife
B.J. Kieffer	Spokane Tribe
Brad Smith	Washington State Fish and Wildlife Commission
Brendan Flynn	Commercial fisherman
Butch Smith	Ilwaco Charters
Cecilia Gobin	Northwest Indian Fisheries Commission
Chad Bowechop & Katie Wrubel	Makah Tribe
Chairman Jay Julius	Lummi Nation
Chairman Leonard Forsman	Suquamish Tribe
Chairman Tom Wooten	Samish Indian Nation
Commissioner Andy Hover	Okanogan County
Commissioner Kathy Pittis	Port of Anacortes
Commissioner Jamie Stephens	San Juan County
Dave Herrera	Skokomish Tribe
Debra Lekanof	Swinomish Tribe
Donna Sandstrom	The Whale Trail
Gary Chandler	Association of Washington Businesses
George Harris	Northwest Marine Trade Association
Jacques White	Long Live the Kings
Jeff Dickison	Squaxin Island Tribe
Jeff Friedman	Pacific Whale Watch Association
Joe Gaydos	The SeaDoc Society
JT Austin	Office of Gov. Inslee
Kaleen Cottingham	Washington State Recreation and Conservation Office
Karen Condon	Colville Confederated Tribes
Kelly McLain	Washington State Department of Agriculture
Ken Balcomb	Center for Whale Research
Kristin Swenddal	Washington State Department of Natural Resources
Thomas (Les) Purce (co-chair)	Formerly president of Evergreen State College
Lisa Lantz	Washington State Parks
Lynne Barre	National Oceanic and Atmospheric Administration
Maia Bellon	Washington State Department of Ecology
Mark Doumit	Washington State Forest Protection Association
Mayor Will Hall	City of Shoreline
Mindy Roberts	Washington Environmental Council
Paul McCollum	Port Gamble S'Klallam Tribe
Phil Anderson	Pacific Salmon Council
Rep. Brian Blake (D)	WA House of Representatives (D), District 19, Aberdeen

Member Name	Organization / Affiliation
Rep. Drew MacEwen (R)	WA House of Representatives (R), District 35, Union
Ron Garner	Puget Sound Anglers
Ron Schulz	Washington State Conservation Commission
Sen. Kevin Ranker (D)	WA State Senate (D), District 40, Orcas Island
Sheida Sahandy	Puget Sound Partnership
Stephanie Solien (co-chair)	Puget Sound Partnership Leadership Council, Vice Chair
Terry Williams	Tulalip Tribes
Tom Davis	Washington State Farm Bureau
Trina Wellman	Northern Economics, Inc.

Working group members

Prey working group

Member Name	Organization / Affiliation
Alene Underwood	Chelan Public Utility District
Alicia Olivas	Hood Canal Coordinating Council Lead Entity
Amy Carey	Sound Action
Casey Baldwin	Colville Confederated Tribes
Dan Paul	Humane Society of the United States
Dave Croonquist	Recreational Fishing Industry
Dave Palazzi	Department of Natural Resources
David Troutt	Nisqually Tribe
Debra Giles	University of Washington Friday Harbor Labs
Giulia Good Stefani	Natural Resource Defense Council
Guy Norman	Northwest Power & Conservation Council
Jay Gordon	Dairy Association
Jeff Dickison	Squaxin Island Tribe
Laura Blackmore	Puget Sound Partnership
Lee Blankenship	Hatchery and Science Review Group
Lisa Jones	Canada Fisheries and Oceans (DFO)
Liz Hamilton	Recreational Fishing Industry
Liz Klumpp	Bonneville
Michael Schmidt	Long Live the Kings
Michele Culver	Washington State Department of Fish and Wildlife
Mike Ford	National Oceanic and Atmospheric Administration
Penny Becker, Co-chair	Washington State Department of Fish and Wildlife
Robb Krehbiel	Defenders of Wildlife
Scott Revell	Roza Irrigation District
Shaun Clements (Chris Kern, alternate)	Oregon State Department of Fish and Wildlife
Skip Anderson	Commercial Fishing
Steve Manlow	Regional Rep Salmon Recovery
Steve Martin, Co-chair	Governor's Salmon Recovery Office
Tiffany Petersen	Makah Tribe

Vessels working group

Member Name	Organization / Affiliation
Brian Corrigan	United States Coast Guard D-13, Law Enforcement
Captain Alan Myers	Washington State Department of Fish and Wildlife
Captain Eric Von Brandenfels	Puget Sound Pilots
Captain Laird Hail	United States Coast Guard
Captain Mike Moore	Pacific Merchants Shipping Association
Captain Scott Ferguson	Washington State Department of Ecology
Chad Bowe chop	Makah Tribal Council Office of Marine Affairs
Commissioner Fred Felleman	Port of Seattle
Cyrilla Cook	Department of Natural Resources
Dr. David Bain	Orca Conservancy
Denien Ford	British Columbia Chamber of Shipping
Donna Sandstrom	The Whale Trail
Dr. Chris McKesson	University of British Columbia
Dr. Deborah Giles	Friday Harbor Labs-University of Washington, Orca Salmon Alliance
Dr. Marla Holt	National Oceanic and Atmospheric Administration
Dr. Rich Osborne	Whale Museum/Soundwatch/University of Washington
Dr. Rob Williams or Dr. Erin Ashe	Oceans Initiative
Dr. Todd Hass, Chair	Puget Sound Partnership
Frances Robertson and Kendra Smith (alternate)	San Juan County Public Works
Haley Kennard	Makah Tribal Council Office of Marine Affairs
Jeff Friedman	Pacific Whale Watching Association
Jeff Pelton	Transport Canada
Joshua Berger	Washington State Department of Commerce
Kevin Bartoy	Washington State Ferries; Washington Department of Transportation
Kurt Russo	Lummi Nation
Lovel Pratt	Friends of the San Juans
Orla Robinson	Port of Vancouver
Steve Finney	Recreational Boaters Association of Washington

Contaminants working group

Member Name	Organization / Affiliation
Abby Barnes	Department of Natural Resources
Andy James	University of Washington
Barbara Zaroff	Kitsap Public Works
Cecilia Wong and Chris Marshall	Environment and Climate Change Canada
Char Naylor	Puyallup Tribe
Christian Nilsen	Geosyntec
Dana DeLeon	City of Tacoma
Deanna Seaman	Northwest Seaport Alliance
Deb Lester	King County Department of Natural Resources and Parks
Derek Day, Co-chair	Washington State Department of Ecology

Dianne Barton
 Emily Howe
 Eric Strecker
 Heather Trim
 Herb Pearse
 Jen McIntyre
 Jennifer Lanksbury
 Jessica Lundin
 Jill Brandenberger
 Jim West
 John Stark
 Ken Zarker
 Laurie Valeriano
 Lincoln Loehr
 Linda Bentley
 Mike Johnson
 Mindy Roberts
 Rachel McCrea
 Robb Krehbiel
 Tom Laurie, Co-chair
 Will Hobbs

Columbia River Inter-Tribal Fish Commission
 The Nature Conservancy
 Geosyntec
 Zero Waste Washington
 Eco-Tec
 Washington Stormwater Center
 Washington State Department of Fish and Wildlife
 National Oceanic and Atmospheric Administration
 Pacific Northwest National Laboratory / Battelle
 Washington State Department of Fish and Wildlife
 Washington Stormwater Center
 Washington State Department of Ecology
 Toxic Free Future
 Retired
 Washington State Department of Commerce
 Puget Sound Partnership
 Washington Environmental Council
 Washington State Department of Ecology
 Defenders of Wildlife
 Washington State Department of Ecology
 Washington State Department of Ecology

Steering committee members

Member Name	Organization/Affiliation
Cathy Cochrane	Puget Sound Partnership
Derek Day	Washington State Department of Ecology
Heather Bartlett	Washington State Department of Ecology
Jim Cahill	Office of Financial Management
JT Austin	Governor's Office - Senior Policy Advisor, Natural Resources
Laura Blackmore	Puget Sound Partnership
Leslie Connelly	Office of Financial Management
Penny Becker	Washington Department of Fish and Wildlife
Stephanie Solien	Co-chair
Steve Martin	Governor's Salmon Recovery Office
Thomas (Les) Purce	Co-chair
Todd Hass	Puget Sound Partnership
Tom Laurie	Washington State Department of Ecology

Consultant team

Member Name

Organization/Affiliation

Abby Hook

Prey working group Liaison, Environmental Science Associates

Angela Pietschmann

Writing support, Cascadia Consulting Group

Gretchen Muller

Vessels/Contaminants working group Liaison, Cascadia Consulting Group

Marc Daudon

The Caspian Group

Nora Ferm Nickum

Project Manager, Cascadia Consulting Group

Susan Gulick

Facilitator, Sound Resolutions

Appendix 3. Voting tally on final package of recommendations

The following table summarizes the votes of each task force member at the November 6 meeting on the final package of recommendations as presented in this report.

The final package was approved with 33 task force members voting to consent, one not consenting, six abstaining and seven absent from the meeting at the time of the vote.

Individual (alphabetically by first name of primary task force representative)	Organization/Affiliation	Consent	Do Not Consent	Abstain	Absent
Amy Scarton	Washington State Department of Transportation	X			
Amy Windrope	Washington State Department of Fish and Wildlife	X			
Andy Hover	County Commissioner, Okanogan County	X			
B.J. Kieffer	Spokane Tribe	X			
Brad Smith	Fish and Wildlife Commission	X			
Brendan Flynn	Commercial fisherman	X			
Butch Smith	Ilwaco Charters	X			
Cecilia Gobin	Northwest Indian Fisheries Commission				X
Chad Bowechop	Makah Tribe	X			
Dave Herrera	Skokomish Tribe			X	
Donna Sandstrom	The Whale Trail	X			
Gary Chandler	Association of Washington Business			X	
George Harris	NW Marine Trade Association	X			
Jacques White	Long Live The Kings	X			
Jamie Stephens	County Commissioner, San Juan County	X			
Lisa Wilson for Chairman Jay Julius	Lummi Nation			X	
Jeff Dickison	Squaxin Island Tribe			X	
Brian Goodremont for Jeff Friedman	Pacific Whale Watch Association		X		
Joe Gaydos	The SeaDoc Society	X			
JT Austin	Gov. Office	X			
Kaleen Cottingham	WA Recreation and Conservation Office	X			
Casey Baldwin for Karen Condon	Colville Confederated Tribes	X			
Kathy Pittis	Port of Anacortes	X			
Kelly McLain	Washington State Department of Agriculture				X
Ken Balcomb	Center for Whale Research				X
Kristin Swenddal	Washington State Department of Natural Resources	X			
Leonard Forsman	Chairman, Suquamish Tribe				X
Les Purce	Co-chair	X			
Lisa Lantz	Washington State Parks	X			
Lynne Barre	National Oceanic and Atmospheric Administration	X			
Maia Bellon	Washington State Department of Ecology	X			

Individual (alphabetically by first name of primary task force representative)	Organization/Affiliation	Consent	Do Not Consent	Abstain	Absent
Mark Doumit	Washington Forest Protection Association			X	
Mindy Roberts	Washington Environmental Council	X			
Paul McCollum	Port Gamble S'Klallam Tribe	X			
Phil Anderson	Pacific Salmon Council				X
Rep. Brian Blake	WA House of Representatives (D)	X			
Rep. Drew MacEwen	WA House of Representatives (R)				X
Ron Garner	Puget Sound Anglers	X			
Ron Schulz	WA Conservation Commission	X			
Sen. Kevin Ranker	WA State Senate (D)	X			
Sheida Sahandy	Puget Sound Partnership	X			
Stephanie Solien	Co-chair	X			
Terry Williams	Tulalip Tribe	X			
Tom Davis	Washington State Farm Bureau			X	
Tom Wooten	Chairman, Samish Indian Nation				X
Trina Wellman	Northern Economics, Inc.	X			
Will Hall	Mayor, City of Shoreline	X			
TOTALS		33	1	6	7

Additional details may be found in the meeting summary on the governor’s [Southern Resident Killer Whale Recovery and Task Force website](#).

Appendix 4. Progress update on executive order immediate actions

Status summaries for each executive order immediate action are provided below. Full final reports for each immediate action are available at the governor's [Southern Resident Killer Whale Recovery and Task Force website](#).

Action: Develop implementation plans for increased enforcement, outreach and education of vessel regulations as well as enforcement of Chinook fisheries regulations in areas frequented by orcas.

Responsible agencies:

- Washington Department of Fish and Wildlife
- Washington State Parks and Recreation Commission

Deadline: April 30, 2018

Status: Completed April 30, 2018

- WDFW Enforcement hired Fish and Wildlife Police Officer positions in the Anacortes and Bellingham stations, funded and dedicated toward Southern Resident orca protection. Approximately 80 marine patrols, focused on limited vessel effects on Southern Resident orcas, took place during the summer months throughout Marine Area 7.
- WDFW Enforcement staff met with the 45 members of the Pacific Whale Watch Association in March 2018 and provided them with available information on Southern Resident orca protection efforts. PWWA shared new industry guidelines that (1) provide requirements for a go-slow zone within a larger perimeter around Southern Resident pods and (2) limit commercial activity near Southern Residents in traditional foraging areas and when other non-Southern Resident viewing options are nearby.
- WDFW Enforcement staff gave a presentation at an event organized by the Whale Museum in April 2018 that provided outreach materials and input to commercial whale watching naturalists ahead of the 2018 season.

Action: Review and amend, as needed, 2018 recreational and commercial fishing regulations prioritizing protection of key areas and fish runs for Southern Resident recovery. Tribal co-managers and international and federal fisheries managers will work directly with Washington Department of Fish and Wildlife and its commission in developing recommendations for implementing this action.

Responsible agencies:

- Washington Department of Fish and Wildlife

Deadline: April 30, 2018

Status: Completed April 30, 2018

- During the 2018 North of Falcon process (annual meeting among state, federal and tribal fishery managers to plan the Northwest's salmon fisheries), department staff engaged commercial and recreational constituents to seek input on prioritizing protection of key areas and fish runs for Southern Resident orca recovery. The North of Falcon process coincides with the March and April meetings of the Pacific Fishery Management Council, the federal authority responsible for setting ocean salmon seasons three to 200 miles off the Pacific coast. In addition to the two PFMC meetings, the state of Washington engages the treaty Indian tribes and constituents in additional meetings to discuss alternative fishing seasons that meet conservation and allocation objectives. In total six meetings throughout Puget Sound had Southern Resident orcas on the agenda.
- For the 2018 fishing season, fisheries that directly overlap in time and space with Southern Resident orca foraging activity have been curtailed.
- WDFW intends to implement a package of outreach and education programs related to Whale-wise guidelines, focused at boat launches and marinas in the San Juan Islands and key access point for vessels intending to travel to the islands, as well as commercial and recreational fishing vessels.
- WDFW will promote the adherence to a voluntary “No-Go” Whale Protection Zone along the western side of San Juan Island in Marine Area 7 (area Southern Residents most frequently use for foraging and socialization in the San Juan Islands) for recreational boats—fishing and non-fishing—and commercial fishing vessels. WDFW will work with state partners to develop a new potential “No-Go” Whale Protection Zone alternative for consideration by the governor’s Southern Resident Killer Whale Task Force as a proposed long-term solution.
- WDFW will work with the Governor’s Office, State Parks and Recreation Commission and the Department of Natural Resources to discuss and consider using our respective authorities to strengthen the efficacy of the voluntary program and outreach efforts.
- For all vessels, WDFW will work with Island County to maintain slow transit speeds (restricted to 7 knots or less) and potentially reduce transit speeds in areas frequently used by Southern Residents in the summer season (specifically off the west coast of San Juan Island) and to silence their sonar in the presence of Southern Residents and when fishing gear is deployed (especially those transmitting at 83 kHz).
- The number of angler trips in certain locations, particularly those important to Southern Residents will be reduced. There are no Chinook-directed fisheries in May-June and September-November or later in the Strait of Juan de Fuca, San Juan Island, Georgia Strait and Admiralty Intel and Port Susan/Port Gardner areas (Marine Areas 5–9).

Action: Explore options and develop a proposal to alter fish food used in state hatcheries to limit the amount of polychlorinated biphenyls in Southern Resident prey.

Responsible agencies:

- Washington Department of Fish and Wildlife

Deadline: April 30, 2018

Status: Completed April 30, 2018

- Hatchery feed is estimated to contribute a maximum of 1 percent of the PCBs measured in adult Chinook from Puget Sound that originated in WDFW hatcheries. Hatchery feed contains low concentrations of PCBs. WDFW is actively engaged with researchers, other government agencies and fish feed manufacturers to identify detectable PCBs in fish feed and will pursue alternative feed options that contain the lowest concentration of PCBs when feasible and cost-effective to do so.
- The amount of PCBs in adult salmon acquired in the freshwater environment, including hatcheries, varies from approximately 1 percent in undeveloped rivers to 4 percent in developed river where outmigrating juvenile fish acquire more PCBs.
- Juvenile salmonids have trace amounts of PCBs through maternal transfer. Most (96 percent to 99 percent) of the PCBs in adult salmonids is acquired in the marine environment in which they migrate and live.

Action: Create a curriculum to improve and increase the number of trainings for vessels in the whale watching industry to become “vessels of opportunity” to assist in the event of an oil spill.

Responsible agencies:

- Washington State Department of Ecology

Deadline: April 30, 2018

Status: Completed March 28, 2018

- The term “vessel of opportunity” describes an organized system to preregister volunteer boat operators who can be quickly activated after a spill occurs and tasked to deter whales away from oil. Vessel operators and their crews would not be working in contact with oil; instead their actions will be limited to surveillance, reporting and deterrence outside of oiled waters.
- The goal for this curriculum is to broadly recruit, pre-register, equip and train whale watching vessels of opportunity to be able to safely conduct Southern Resident deterrence activities during a major oil spill. Outreach will support three phases of the curriculum plan: awareness, training and implementation.
- The curriculum plan is published at:
<https://fortress.wa.gov/ecy/publications/summaryPages/1808006.html>

Action: Develop strategies for quieting state ferries in areas most important to Southern Residents.**Responsible agencies:**

- Washington State Department of Transportation

Deadline: May 31, 2018**Status: Completed May 31, 2018**

- Unless safety or schedule dictate otherwise, Washington State Ferries will slow its vessels through the Haro Strait shipping channel from 16 knots to 11 knots during its two daily crossings to Sidney, BC beginning with summer schedule June 24, 2018.
- From August 2018 to January 2019, WSF will participate in Enhancing Cetacean Habitat and Observation Program's trial of the Whale Report Alert System and use the notifications to indicate when vessels should slow to 11 knots through the Haro Strait shipping channel.
- WSF is undertaking analysis of existing data to determine if such data can be used to develop baseline noise levels for the entire fleet. (Pilot project on two vessel classes to be completed by July 2018). WSF will seek funding from the Federal Highway Administration, National Oceanic and Atmospheric Administration and others to expand noise analysis pilot project to existing data and collect additional new data to fill data gaps to develop baseline noise levels for the entire fleet.
- Following completion of baseline noise analysis, WSF will identify and implement mitigation measures, both operational and engineered, to address on-vessel sources of frequencies of concern.
- By January 2019, WSF will begin a program to minimize trim on vessels through improved loading procedures, related primarily to reducing fuel consumption in response to the governor's Executive Order 18-01, with a potential co-benefit of reducing noise generated by pressure differential and cavitation.
- In January of 2019, WSF will incorporate a marine mammal training program as part of its mate orientation.
- WSF will participate as members of the governor's Executive Order 18-02 task force and Vessels Work Group to develop additional measures and support for actions that may benefit Southern Residents.
- WSF will include vessel noise reduction as a key criterion for future vessel design-build contracts.
- WSF will pursue electrification of Jumbo Mark IIs, related primarily to reducing fuel consumption in response to the governor's Executive Order 18-01, with a potential co-benefit of noise reduction.

- As part of a current long-range planning effort, WSF will investigate an electric hybrid ferry to replace the MV Elwha as one of two vessels in the fleet meeting Safety of Life at Sea standards for the crossing to Sidney, BC.
- WSF will continue negotiations with NOAA National Marine Fisheries Service and U.S. Fish and Wildlife Service for a programmatic Endangered Species Act consultation for pile driving that includes a conservation program addressing Southern Residents and salmon responsive to the established recovery plans for those species.
- WSF will pursue a Letter of Authorization from NOAA National Marine Fisheries Service covering incidental harassment of marine mammals by pile driving noise.
- WSF will continue to remove creosote from its assets with 8,000 tons planned for removal by 2020.
- WSF will seek funding to study baseline stormwater quality at its facilities.
- WSF will develop additional agency policy addressing Southern Resident orca conservation and recovery efforts as needs are identified.
- WSF will pursue grant and internship opportunities with Orca Network, the Whale Museum, the Whale Trail and others to increase naturalist and other education programs aboard vessels.

Action: Prioritize existing outreach resources to support Southern Resident recovery. Collaborate with the Governor's Office to develop a public education program and identify needed resources.

Responsible agencies:

- Puget Sound Partnership
- Washington Department of Fish and Wildlife
- Governor's Salmon Recovery Office
- Washington State Parks and Recreation Commission
- Washington State Department of Licensing

Deadline: July 1, 2018

Status: Completed July 1, 2018

- In May 2018, the Governor's Office, WDFW, Ecology, and PSP created webpages on their websites to share information with the public about Southern Resident orca recovery. The agencies coordinated messaging and information to emphasize the science behind orca recovery and the urgent need to take action.
- In May, the Governor's Office, WDFW, Parks, Ecology, Dept. of Licensing, GSRO, PSP and NOAA formed an interagency communications workgroup to share information relevant to outreach and education, develop a shared communications plan, and take collective action on communication opportunities and requests arising via the task force. The

workgroup continues to meet twice monthly and periodically updates the shared communications plan with actions accomplished and actions anticipated.

- The interagency communications group invited communication staff from task force entities and interested parties to meet periodically and discuss collaborative action for public outreach and education concerning orca recovery. This larger group of communicators convened in July 2018 and September 2018, with plans to continue meeting into the future. The group identified funding for outreach and education activities as a major barrier; several members are investigating the possibility of applying for grants and private funding.

Action: Identify the highest priority areas and watersheds for Southern Resident prey to focus or adjust, as needed, restoration, protection, incentives, hatcheries, harvest levels and passage policies and programs.

Responsible agencies:

- Washington Department of Fish and Wildlife
- Governor's Salmon Recovery Office
- Puget Sound Partnership

Deadline: July 31, 2018

Status: Completed July 31, 2018

- WDFW and NOAA have developed criteria to determine Chinook stocks likely to be most beneficial to Southern Residents, using the best available information on whale diet at different times and places, fisheries data about chinook stocks that overlap with whale distribution and prioritizing stocks that if boosted may aid the Southern Residents at a critical time of year.
- The National Fish and Wildlife Foundation held a workshop June 12–13, 2018, bringing together a small group of agency, tribal, academic, nonprofit and other scientists and managers to provide feedback and validation on the priorities criteria. The review of initial priorities included evaluation of the considerations used to identify priorities and modeled the outputs of which stocks would rise to be priorities based on criteria selected. NOAA and WDFW have further refined the criteria based upon input from the workshop. The model, list of priority stocks and some frequently asked questions can be found on the NOAA webpage at:
https://www.westcoast.fisheries.noaa.gov/protected_species/marine_mammals/killer_whale/Killer_whale_priority_chinook_salmon_q_a.html
- The model will continue to be updated as we gather additional data and increase our knowledge of where Chinook salmon overlap with the whales, what Chinook runs are important to the whales' diet and where and when the whales are food limited.

Action: Develop criteria to prioritize financial assistance beginning in the 2019–21 biennium for stormwater projects that benefit Southern Resident recovery.

Responsible agencies:

- Washington State Department of Ecology

Deadline: July 31, 2018

Status: Completed July 31, 2018

- The Water Quality Program will add language to the combined water quality application guideline document and scoring guidelines referencing governor’s Executive Order 18-02 and Southern Resident Orca recovery as an additional criterion/consideration that stormwater funding applicants can make connection to as a priority for those projects addressing Puget Sound water quality issues. Language will be added through the current guideline revision process for the upcoming state fiscal year 2020 fund cycle which opens for applications in August 2018.
- We will coordinate with the National Estuary Program Stormwater Initiative team (housed in Ecology’s Water Quality Program) to address Executive Order 18-02 connections to projects funded through its process, which are already Puget Sound recovery focused.

Action: Demonstrate how Chinook recovery projects benefit Southern Resident recovery, beginning in the 2018 grant round, for the Pacific Coast Salmon Recovery Fund, the Puget Sound Acquisition and Restoration Program, the Estuary and Salmon Restoration Program and the Washington Coastal Restoration Initiative.

Responsible agencies:

- Puget Sound Partnership
- Washington Department of Fish and Wildlife
- Governor’s Salmon Recovery Office

Deadline: December 15, 2018

Status: Progress update provided August 22, 2018

- The majority of projects that are currently active, awaiting funding decision, or proposed for funding (2019–21) through the salmon recovery grant programs at the Recreation and Conservation Office benefit Chinook salmon populations. Specifically:
 - 80 percent of projects currently funded in the four programs identified in the Executive Order benefit Chinook.
 - 82 percent of projects proposed for future funding in the four programs identified in the Executive Order benefit Chinook.

Appendix 5. Minority reports from task force members

Minority report from Ken Balcomb, Center for Whale Research

11 November 2018 Statement of Ken Balcomb for Governor Jay Inslee

Dear Governor Inslee,

Thank you for your good faith effort to convene a Task Force to make recommendations to you regarding how to recover the Southern Resident Killer Whale population, and for the honor of inviting my participation in the process. You have before you the list of recommendations that were discussed at length among the Task Force members, and I herein submit my minority report.

The Co-Chairs and organizers of the Task Force meetings and all of the Member participants worked diligently to wrestle through some very difficult environmental issues; and, some very polarized stakeholder positions were brought to the table. I was heartened to see that Goal 1 is to increase Chinook abundance to benefit SRKW's, because that is what they most need most urgently. There are sixteen specific recommendations put forth to move toward that goal, and most of them have at least some optimism of benefit for the SRKW. However, virtually all of the recommendations have hoped-for results that might appear in the distant future and be impossible to evaluate with respect to significant whale demographic trajectory change in a meaningful time-frame. Some of the recommendations are clearly self-serving for stakeholders, but that is my observation more than a criticism.

Throughout the meetings I have been dismayed that the discussion of bypass of the four Lower Snake River dams (Recommendation 9) did not get more traction, given that action would offer the most immediate and dramatic increase in returning adult Chinook salmon to the mouth of the Columbia River and Washington coast (prime SRKW foraging areas) in the shortest time (2-3 years). The 4LSR dams never should have been built and have been an acknowledged ecological disaster from their conception. I kept hoping that you would simply initiate a phone call to LT General Semonite (the commanding general of the Army Corps of Engineers) to get the facts about who has the authority to order bypass of these dams, but it seems that the consensus of the Task Force was to establish a time-consuming several year stakeholder process to address issues associated with the possible breaching or removal of the four lower Snake River dams, rather than get the facts now and/or make a bold recommendation. The number one fact, who has the authority, can be answered in a phone call, but it seems that the forces against bypass want to keep everyone confused. As a result, recommendation number 9 now slips into a less meaningful timeframe and back into the quibbling that has gone on for decades while the salmon and SRKW continue to dwindle. My discussions with career salmon biologists who studied the spill option (#8) and NOAA's own reports conclude that following that recommendation will not lead to salmon recovery, either. So it looks like the SRKW are stuck with the failed status quo.

The second Goal of decreasing disturbance to whales in the Salish Sea has a feel-good veneer but it results from naïve hypotheses elevated to hysterical dogma that the SRKW are suffering from stress of all the underwater noise and/or cannot find their food in the din. It may seem odd coming from someone like me who has sounded the alarm over military sonar, but those sound sources are many orders of magnitude louder and designed to be stressful and injurious; whereas, ordinary vessel radiated propulsion sound is an anthropogenic acoustic feature that creates little overlap into the biosonar envelope of the whales, and in its steady predictable pattern is readily accommodated. Whales evolved in occasionally extremely noisy sound fields and are exquisitely adapted to interpret their acoustic environment as it changes - they behaviorally react more to abrupt starts and stops and changes of frequency and intensity than they do to small vessels idling in their vicinity. They will voluntarily approach the extremely loud sound field of large vessels underway to ride in the bow and stern wake within meters like surfers, and then they go about their ordinary travelling and feeding. In years not too long ago they would approach and take fish from fishermen's gear in spite of gunshot, seal bombs, and dynamite aimed at them. Alaskan fish-eating Orca still receive those insults. The twelve recommendations in pursuit of Goal 2 are largely "red herrings" compared to Chinook salmon restoration, and their effect on SRKW demographics or distribution cannot be objectively evaluated in spite of the hysterics of some Task Force Members. Regrettably, recommendation number 28 represents the worst in cliff-hang politicking and coercing for a diversionary recommendation that is meaningless for whale protection, while obfuscating much more important issues. I give it a "thumbs-down" and the other recommendations in this goal a "ho-hum".

Goal #3 to reduce toxins in the environment is laudable and long overdue, but it provides no immediate relief to the SRKW and it will be decades, if not centuries before the half-lives of many of the most noxious legacy chemicals expire. Interestingly, the lethal toxin premise completely ignores the fact that the much more contaminated ecotype Transient killer whales are flourishing. The effects of implementing the five recommendations for this laudable goal will more likely benefit the food chain and the prey in the near-term than benefit the predators in a demographic way. I would give these recommendations a "thumbs-up" and accept that their goal is in the long term category of actions.

Thank you,



Minority report from Kathy Pittis, Port of Anacortes, and Gary Chandler, Association of Washington Business

Les Purce, Co-chair
Stephanie Solien, Co-chair
The Southern Resident Killer Whale Task Force
Office of the Governor
PO Box 40002
Olympia, WA 98504-0002

Dear Co-chair Purce and Co-chair Solien,

As you are well aware, each of us is personally committed to taking immediate actions to protect and recover our Southern Resident Killer Whales. These beautiful animals are powerful icons that live in our collective imaginations. Killer whales, like the salmon they feed upon, have existed from “time immemorial” in the Pacific Northwest and Washington State. We could not have been surprised that Task Force members felt viscerally, as a united community, the suffering and death of whales this summer. We thank Governor Inslee for charging us to help lead our fellow citizens away from a world forever diminished by a terrible and preventable loss. It has been our privilege to serve the public interest as members of the Southern Resident Killer Whale Task Force.

We remain concerned the Task Force lacked basic information about the costs associated with individual recommendations. When combined with a lack of data regarding the benefits of these recommendations, the Task Force as a whole had no way to evaluate priorities; to elevate recommendations offering bang for the buck or eliminate those with low benefits but high costs. For example, which habitat investments offer the greatest benefits? A great deal of work has been done to evaluate the relative costs and benefits of a wide range of salmon and Puget Sound recovery projects.

Despite a thorough briefing by the Office of Financial Management regarding the \$1.5 billion budget shortfall facing the state, the Task Force made only minor recommendations regarding specific new fund sources necessary to accomplish its recommendations. We believe a consensus on a specific plan to fund our recommendations would have advanced the chances for success in the 2019 Legislature immeasurably.

In several instances, our shared urgency seemed to drive the Task Force to accept extreme positions that were not well justified by objective data. For example, the water quality standards in effect in the State of Washington are among the most stringent in the nation. Absent an extended scientific discussion of the merits and a much stronger understanding of the strong connection between existing standards and those recommended by the Task Force, elements of Recommendation 32 lack adequate justification. Cost and benefit data would have been especially useful in this case.

We believe the Task Force would have been well served to consider more thoroughly the benefits of moving rapidly to augment treatment of municipal stormwater runoff. The horrifying fact of pre-spawn mortality in urban streams demands immediate action. In truth, contaminated stormwater lacks a bad guy. Each of us causes this harm in our small way as we commute to work, drive our

kids to school, and head to the grocery store. Again, the lack of a consensus funding recommendation does a disservice to the Southern Resident Killer Whales and a healthy Puget Sound. It is irrational to expect a small capital budget appropriation to address a problem of this scope and scale. Much more should be expected of municipal governments through the use of existing stormwater utility authorities and regulatory intervention by the Department of Ecology.

With regard to toxic contamination, we believe the recommendations should have been more forceful: get the worst out of the water first. Large scale toxic cleanup projects stand ready to proceed. At the Port of Everett, a \$100 million cleanup improves near-shore habitat for prey species and migrating juvenile salmon. Funding generated by the Model Toxics Control Act should prioritize actions with clear environmental and economic benefits. We are disappointed the recommendations did not advocate more forcefully for these actions.

In our experience, processes of this kind, operating in an emotionally charged context under extraordinary time pressure, lacking a shared understanding of the best available science, and having no framework by which to evaluate and prioritize actions will inevitably fall short of consensus. Each member of the Task Force has felt the strain of the conflict between our principles and necessary compromise. We recognize that much good work has been accomplished despite these challenges.

However, we have concluded that our responsibilities to the public and to the elected officials who will consider the Task Force recommendations require us to formally submit a minority report as provided for in the Task Force Charter adopted on May 1, 2018.

Collectively we have identified three over-riding concerns with the Southern Resident Killer Whale Task Force Final Report. Respectfully, we offer the following formal objections:

Spill and Total Dissolved Gas

Recommendation 8 advocates for increasing spill by adjusting Total Dissolved Gas (TDG) allowances at Snake and Columbia River dams. The purported benefit of the recommendation is to increase the number of migrating juvenile salmon that pass these facilities. Despite a lack of data documenting benefits to fish as a result of the court-ordered 2018 spill regime, the Task Force is suggesting even higher levels of spill, which would need to be accompanied by waivers for even higher levels of dissolved gas. Waivers must be sought for high levels of dissolved gas, because it causes gas bubble trauma and kills migrating juvenile salmon. Advocating for an increase of TDG levels up to 125% in the Columbia and Snake Rivers is contrary to the Task Force's goals to increase Chinook abundance and to recover Chinook populations.

This narrow focus on spill as a fish recovery concept ignores the important improvements which have been made at the dams. These include fish-friendly turbines, bypass screens, removable spillway weirs, and transportation of juveniles around the projects. Though the Task Force has selected 125% TDG as a number to recommend to the Washington State Department of Ecology, we respectfully suggest that this matter is more appropriate for analysis and recommendations by federal and state fish managers.

Snake River Dam Breaching Impacts

Recommendation 9 requires a report to the Task Force, involving the National Research Council, regarding broad potential impacts of breaching or removal of the Snake River dams. This recommendation is an unnecessary attempt by the Task Force to duplicate the much more extensive federal effort already underway by the U.S. Army Corps of Engineers, Bureau of Reclamation, and Bonneville Power Administration to prepare an environmental impact statement (EIS) in accordance with the National Environmental Policy Act on the operations and configurations for 14 federal projects in the Columbia River System in the interior Columbia River Basin.

The Columbia River System Operations (CRSO) EIS will present a range of reasonable alternatives for long-term system operations and evaluate the potential environmental and socioeconomic impacts on flood risk management, irrigation, power generation, navigation, fish and wildlife conservation, cultural resources, water quality and recreation. Snake River dam breaching is one of the alternatives which will be studied. Since Snake River dam breaching would impact or eliminate certain authorized purposes, such as commercial navigation, the EIS will include an economic impact analysis. This analysis will include an assessment of different modes of transportation like rail and trucking, and identify and describe tradeoffs. This analysis also will determine both costs and benefits to regional biological and socio-economic resources. The action recommended by the Task Force lacks the time and likely the resources to produce a credible product useful to decision makers. The duplication of the federal effort, already long underway, is wasteful and would divert resources away from actions that could produce real benefits in the short-term.

For those on the Task Force who are concerned about the timeline for completion of the CRSO EIS, please note the following information which was recently released by the federal agencies at www.crso.info:

- 1) On October 19, 2018, the federal co-lead agencies, NOAA Fisheries, and the U.S. Fish & Wildlife Service received a directive from the President to develop a schedule to complete the Columbia River System Operations (CRSO) Environmental Impact Statement (EIS) and associated biological opinions by 2020. We are working with these agencies to develop that schedule to submit to the Chair of the Council on Environmental Quality (CEQ) within the 60-day timeframe as required by the President.
- 2) After submitting a schedule to CEQ and once a final schedule is developed, the timeline will be shared with cooperating agencies, states, tribes, and the public. The operators of the Federal Columbia River Power System are committed to continuing to conduct an open, transparent, and collaborative process as we implement a new schedule and complete the CRSO EIS.

Hydraulic Permit Approvals

Discussions of the Hydraulic Permit Approvals issued by the Department of Fish and Wildlife made no attempt to resolve the long-standing public policy conflicts that have blocked progress in previous legislatures. While the pressure of time is to blame, we fear the Task Force has failed to listen deeply to develop full understanding of the challenges facing this recommendation.

Nonetheless, the organizations we represent will engage in good faith discussions regarding the Hydraulic Permit Approvals during the 2019 Legislative Session.

We feel compelled to thank Les Purce and Stephanie Solien for their steady, patient leadership. Their task was immense, but they managed it with grace and intelligence. Likewise, we thank our colleagues on the Task Force for opening their hearts to us, for sharing their hopes and tears. Each of us has been changed by what we learned from our fellows and by the many connections we developed with members of the public who engaged with us. We are grateful to have played our small role and hope that the efforts of Governor Inslee's Southern Resident Killer Whale Task Force meet with every success.

In closing, we offer our profound thanks to Governor Inslee for seeing beyond the horizon of the everyday and in doing so opening our eyes to the systemic problem that festers just beneath the shimmering surface of Puget Sound on even the brightest summer days.

Sincerely,



Kathy Pittis, Commissioner, Port of Anacortes



Gary Chandler, Vice President of Government Affairs, Association of Washington Business

Additional letter from Kathy Pittis, Port of Anacortes

Les Purce, Co-chair
Stephanie Solien, Co-chair
The Southern Resident Killer Whale Task Force
Office of the Governor
PO Box 40002
Olympia, WA 98504-0002

Dear Co-chair Purce and Co-chair Solien,

After considerable deliberation, I have concluded that language in Recommendation 22 within the Task Force report merited inclusion in the minority report previously submitted on Tuesday, November 12th. I respectfully request the following be added to the minority report:

With regard to the Recommendation 22, I strongly believe it would be improved by the deletion of the sentence referring to the role of the Washington Public Ports Association in the creation of an ECHO program in Washington State. As it proceeds in its efforts in 2019, I urge the Task Force to rely upon the following language to assess progress:

“Puget Sound Ports will convene a meeting with the above-mentioned partners by Spring 2019 to identify ways to collaborate with the Port of Vancouver’s ECHO Program.”

The language better reflects the manner in which the recommendation will be implemented in Puget Sound. The ports themselves have capacity to implement Recommendation 22 that is simply not available to the Washington Public Ports Association.

Thank you for considering this request as a correction to the previous minority report.

Respectfully,

A handwritten signature in black ink, appearing to read 'Kathy Pittis', followed by a stylized circular mark or flourish.

Kathy Pittis, Commissioner, Port of Anacortes

Minority report from George Harris, Northwest Marine Trade Association

To: Steering Committee of the Southern Resident Killer Whale Task Force

Date: November 13, 2018

From: Northwest Marine Trade Association
Recreational Boating Association of Washington

Subject: **Minority Report Regarding Task Force Recommendations**

The Northwest Marine Trade Association (NMTA) and the Recreational Boating Association of Washington (RBAW) respectfully submit Minority Report comments about the following Southern Resident Killer Whale (SRKW) Task Force Recommendations.

Recommendation 12: Direct the appropriate agencies to work with tribes and NOAA to determine if pinniped predation is a limiting factor for Chinook in Puget Sound and along Washington's outer coast and evaluate potential management actions.

We think the best available science confirms pinniped predation is a significant factor limiting the availability of Salish Sea chinook for SRKWs and the forthcoming Salish Sea Marine Survival Project will further confirm this.

Recommendation 19: Require an annual "Be Whale Wise" certification for all recreational boaters on the inland marine waters and ensure that all boaters are educated on how to limit boating impacts to orcas. Includes \$10 fee on all boaters – structured as 'opt-out'

The NMTA and RBAW are supportive of efforts to better educate boaters and to voluntarily use Be Whale Wise as a way to increase education and awareness. It is the \$10 opt-out fee on all boaters that is of significant concern to our organizations. The \$10 fee is proposed to be added to all 2019 registrations with an opt-out provision similar to what citizens see for Washington State Parks on their vehicle license renewals.

We believe it is grossly unfair to attempt to fund a Be Whale Wise certification program on the backs of recreational boaters who already pay far more than their fair share into the state general fund for environmental stewardship. Specifically, recreational boaters are the largest outside contributor to both the Aquatic Invasive Species program administered by WDFW and the Derelict Vessel Removal Program administered by DNR – paying \$2 per registration and \$3 per registration, respectively, for these two important programs.

NMTA and RBAW recommend the Be Whale Wise guidelines be included with all vessel registrations and that a *voluntary* contribution of any amount should be allowed and encouraged.

To illustrate the concern recreational boaters have with being unfairly singled out, consider a 2010 JLARC report on recreational boating activities:

<http://leg.wa.gov/jlarc/AuditAndStudyReports/Documents/10-12.pdf> The report notes that recreational boaters contribute \$71.9M per biennium for taxes, fees and permits and receive only \$54M in services. The JLARC report shows that boaters are already contributing financially more than any other user group.

Recommendation 28: Suspend viewing of Southern Resident Killer Whales for 3-5 years.

NMTA's position throughout the Task Force process is that recreational boaters do not consider SRKW viewing as a primary activity and that it is reasonable to strongly encourage all recreational boaters to avoid the SRKWs whenever possible. Furthermore, when boaters do encounter SRKWs they should strictly adhere to the Be Whale Wise guidelines. Suspending viewing of SRKWs will not impact recreational boating businesses, but we do think it will significantly impact commercial whale watching businesses.

Throughout the Task Force process commercial whale watching businesses communicated that SRKW viewing presently represents only 20% of their tours because they have voluntarily stopped viewing SRKWs and that healthy populations of northern transients, humpback and gray whales are available in greater numbers for viewing. The voluntary regulations the Pacific Whale Watching Association has implemented are notable and impressive.

NMTA and RBAW recommend this recommendation be delayed until Year Two of the Task Force so the Vessel Working Group can fully review the best available science and make a recommendation to the Task Force for the following reasons. 1) Some SRKW experts believe commercial whale watching vessels are helpful and protective to the SRKWs. 2) This new recommendation was discussed briefly and quickly at the final Task Force meeting. 3) Suspended viewing could have significant economic impact to commercial whale watching businesses because the media and the public may inaccurately think all whale watching has been suspended. 4) Increasing the "Go Slow Bubble" to 800-yards for all vessels as per Recommendation 17 is a significant new protective measure for 2019.

Minority report from Donna Sandstrom, The Whale Trail

November 12, 2018

Office of the Governor
P.O. Box 40002
Olympia, WA 98504-0002

Re: Task Force Minority Report, Recommendation 13

Dear Governor Inslee,

Thank you for the honor of serving as a member of your Task Force on Southern Resident Killer Whale Recovery. The Task Force has recommended a robust set of actions that will make a difference for these beloved and iconic pods.

The Whale Trail Board and I heartily support all the actions except Recommendation 13. Recommendation 13 encourages support for an exemption of the Marine Mammal Protection Act (MMPA) to allow culling of seals and sea lions in the Columbia River Basin, and to add Steller sea lions to the animals that can be killed.

We do not support the recommendation for the following reasons:

1. It doesn't work. As a management approach, lethal removal of pinnipeds rarely achieves its intended outcome. Lethal removal is most likely to be successful only when the location is remote, and the animals that are killed are not replaced by others. That is not the case at the Columbia River Basin. If we remove 100 seals today, they will be replaced by 100 seals tomorrow, and 100 more the day after that. How many seals and sea lions are we willing to kill before there is any discernible difference for the southern resident orcas?
2. It will have unintended consequences. When we tug at the thread of an ecosystem, we don't know what will unravel. Killing enough pinnipeds to make a difference at the Columbia River Basin will disrupt the environment in ways we can't predict. For example, what happens to the animals like transient orcas who depend on the seals and the sea lions for food?
3. It is counterproductive to our conservation values and goals. The Whale Trail was founded to promote shore-based viewing of orcas and other marine mammals, and to inspire stewardship for them. People connect to the ocean through its creatures. They thrill to see seals and sea lions in our state waters. The public interest is best and well served by protecting the pinnipeds who share our shores and seas.
4. Steller sea lions have only recently recovered from being endangered, and were removed from the Endangered Species list just 11 years ago. They continue to face human-caused threats such as climate change, entanglements, and vessel strikes. Stellar sea lions are an integral part of the North Pacific ecosystem. They deserved continued protection under the MMPA in the Columbia River Basin and throughout their range.

5. We do not support any exemption to the Marine Mammal Protection Act. The MMPA has successfully and effectively protected marine mammals since 1972. We do not encourage any exceptions that weaken the Act, or open the door to other special cases around the country.

In closing, we do not support Recommendation 13 because it yields little benefit to the southern resident orcas, and it will be counterproductive to engaging the public in SRKW recovery.

Humans have created the artificial conditions that attract predators to the Columbia River Basin. We have also created the scarcity that drives the perceived competition for prey. Yet only the animals are held accountable, paying for our mismanagement with their lives.

It wasn't that long ago that people were shooting orcas along this coast because they, too, were seen as competitors for salmon.

We encourage you to disregard Recommendation 13, and focus state time and resources on other actions that are more likely to achieve our goal of recovering the southern residents.

Respectfully,



Donna Sandstrom
Founder/Director
The Whale Trail

cc: Les Purce, Stephanie Solien

Policy recommendation and minority report from Jeff Friedman, Pacific Whale Watch Association

In partnership with the many organizations and persons signed below, the Pacific Whale Watch Association submits this recommendation for additional actions to be considered and included by Governor Inslee in his upcoming executive action and legislative agenda.

The Pacific Whale Watch Association (PWWA) continues to be an engaged partner as a member of the Governor's Orca Task Force (OTF), and will continue to seek bold action on behalf of the Southern Resident Killer Whale (SRKW) population. The OTF report's recommendation 28 was hurried through the task force process without the thoughtful and detailed vetting found in all other recommendations that are included in the final report for the Governor.

Because the language for Recommendation 28 was proposed late in the final meeting of the task force, and was only granted a few minutes of discussion prior to a vote, it is the only recommendation that is vague and lacks any implementation details. Most importantly, stakeholder engagement and input from the scientific community was absent from the process behind recommendation 28.

Because of the absence of stakeholder and scientific engagement, recommendation 28 carries serious risks of harm to SRKWs and other negative consequences. These risks would have been mitigated through proper vetting, stakeholder engagement and input from the science community.

Due to our concern over the welfare of the SRKWs and the negative consequences of this recommendation, PWWA has partnered once again with the scientific community, including several members of the OTF Vessel Working Group, to mitigate these risks through a science-based vessel management plan. We intend to work with Governor Inslee's office, WDFW, the OTF Co-Chairs, and other stakeholders to assist in developing implementation plans and rule making around the science-based vessel management plan.

History of Recommendation 28

Recommendation 28 offered several options to establish either a no go zone or a go slow zone (or both) in a fixed geographic area on the west side of San Juan Island. There were 3 options being considered by OTF and these options were sent to OTF members prior to the November 6th meeting. PWWA supports all of the original 3 options listed under Recommendation 28 (Options A, B, and C). During discussions at the OTF meeting on November 6th, the options under Recommendation 28 were:

Recommendation 28: Establish a whale protection zone to reduce disturbance to foraging orcas.

Note: As planned, a Task Force member convened two conference calls where options were discussed with a sub-group that expressed interest at the October 17-18 Task Force meeting. There has not been agreement on draft Recommendation 28 to date and further discussion will take place at the November 6 meeting.

Option A- No Go Zone and Go Slow Zone

- Establish a go-slow zone for all vessels on the west side of San Juan Island from Cattle Point to Pile Point, within ¼ mile of shore, with a speed limit of 7 knots over ground. In addition, establish a no-go whale protection zone for commercial whale watching vessels, recreational vessels, and commercial kayak groups on the west side of San Juan Island from Pile Point to Mitchell Bay, within ¼ mile of shore. Allow vessels to transect the no-go zone to exit from shore.

Option B- Go Slow Zone

- Establish a go-slow zone for all vessels on the west side of San Juan Island from Cattle Point to Mitchell Bay, within ¼ mile of shore, with a speed limit of 7 knots over ground.

Option C- Update Science, and Seek to Identify Zone with Additional Participation of Others in 2019

- The best available science (Ashe et al. 2009) indicates that a polygon of 7.4 square nautical miles, extending 1 mile off south-west San Juan Island outlines an optimal candidate no-entry zone for small vessels. This area was identified because it is a “high-probability feeding area” for Southern Resident orcas where feeding behavior is 2.7 times more likely to occur than in areas beyond its boundaries. As already proposed by San Juan County, this study should be updated with more recent information including current Southern Resident orca distribution patterns to generate a revised candidate area. Once the updated science is available in 2019, pursue actions to identify and protect Southern Resident orcas while they are off south-west San Juan Island, with the exact boundaries or subdivisions of the candidate area(s) to be determined by science, stakeholder engagement and consultation with Tribal co-managers.

During the fishbowl discussion at the meeting the OTF was not able to reach consensus on any of the three options (Option A, B, or C). Toward the end of the discussion, a new proposal (Option D) was offered and voted on with very limited discussion. Option D became the new Recommendation 28. Option D reads as follows:

Suspend viewing of Southern Resident orcas

- Establish a whale watching regulation that precludes Southern Resident orca viewing by all boats in Puget Sound for the next 3-5 years. The governor should direct WDFW to begin rulemaking to define Washington whale watching in coordination with the commercial whale watching industry, kayak industry, local governments and interested non-governmental organizations.
- Report back to the governor and legislature after 3-5 years on the effectiveness of the suspension.

Risks & Unintended Consequences of Recommendation 28

The original intent of Recommendation 28 was to create a geographically based no go zone. It now seeks to create a no go zone around the SRKW's. However, since the whales are nearly always spread out into multiple groups, and often into small groups and single whales spread over miles,

Recommendation 28 creates 74 no go zones that are constantly in motion and often moving 50-100 miles per day.

The real-world practical challenges and consequences of establishing and maintaining 74 no go zones were not discussed during any of the OTF or Vessel Working Group meetings. Because Recommendation 28 was not properly vetted, implementation will lead to unintended consequences — or an inability to have effective enforcement at all. Many of these consequences will negatively impact or eliminate some of the benefits to the SRKWs of a near-zero impact form of commercial whale watching:

The potential negative consequences include:

- Without the presence of PWWA vessels with SRKWs, the sound in the waters surrounding the SRKWs will likely increase due to recreational, shipping (and other) vessels traveling at high speed, unaware of the presence of SRKWs. This high-speed travel drastically increases sound in the water.

PWWA vessels often serve as sentinels for the SRKWs, alerting recreational and other vessels to their presence which keeps other boaters clear of the whales' path, slows the speed of their boats, and models good behavior. Enforcement officers and Soundwatch often inform recreational boaters to model their behavior after the professional whale watch vessels when in the presence of whales. Furthermore, data shows that recreational boaters are more likely to exhibit good behavior around the SRKWs when PWWA boats are present.

If PWWA boats are not present with SRKWs, it creates a high risk that other boaters, unaware of the presence of SRKWs, will travel at high speed over whales. This will lead to a net increase of sound around SRKWs, especially in key foraging areas, and raises potential for other types of vessel impacts.

- PWWA vessels routinely alert law enforcement and boater education vessels (eg the Soundwatch Boater Education Program) to the presence and identity of whales. This allows these vessels to efficiently locate whales, arrive on scene, and provide accurate information to the public.

Moreover, because the SRKWs are often spread over miles in small groups, it is not possible for enforcement and Soundwatch vessels to monitor recreational vessel traffic around all groups of SRKWs.

PWWA vessels alert enforcement and Soundwatch to other vessel types traveling at high speed approaching the path of the whales.

Without the presence of PWWA boats with SRKWs, we will not be able to assist in alerting enforcement to the presence of SRKWs and helping to identify other vessels

traveling toward each group of SRKWs.

- Several times each season, PWWA vessels alert the military of the presence of whales in proximity to active military exercises. With hazardous air, surface, and subsurface exercises occurring frequently throughout the year, PWWA serves as an important safeguard for SRKWs when they are near military ranges. The suspension of viewing SRKWs puts the SRKWs at risk of impacts from military exercises.
- The Center for Whale Research has maintained a record of sighting data and days of presence from J, K and L pod dating back to 1976. Today, with the SRKWs spending less time in Haro Strait and the Salish Sea and often spread into multiple groups when they are present, the Center for Whale Research greatly depends on PWWA sightings data for its ongoing sightings database. The suspension on viewing SRKWs puts the continuity of the long-term data set in jeopardy.
- Many other scientists and researchers depend on PWWA sightings data for ongoing research, publications, and conservation advocacy. Without PWWA sightings data, this work will be negatively impacted.
- PWWA serves an important role in educating passengers about SRKWs and inspiring them to get involved in conservation efforts, habitat restoration projects, and other actions they can take at home to help SRKWs. PWWA companies also connect passengers to fundraising opportunities to financially contribute to regional NGOs working on conservation, habitat restoration and salmon recovery. PWWA facilitates passenger donations of over \$500,000 per year to help SRKWs. This role will be more difficult without being able to connect people directly with SRKWs and their life stories.

Science-Based Vessel Management Plan – PWWA Requests Governor Inslee reflect this plan in his Orca Task Force legislative and executive agenda

The purpose of this section is to outline key components of Science-Based Vessel Management Plan (SBVMP) for PWWA around SRKWs. The purpose of the SBVMP is to help direct Washington State and/or National Marine Fisheries Services to create science-based laws governing how vessels must behave around SRKW. This SBVMP has been created with the input from scientists listed below, including leading experts on the subject of acoustics and SRKW behavior. The goal of this approach is to accomplish a “near zero” acoustic footprint of vessels in the vicinity of SRKW while allowing PWWA vessels to continue their contributions to education, conservation, stewardship, and research efforts. This plan has been created as an alternative to a moratorium on watching SRKW.

Key Components of a Science-Based Vessel Management Plan

The purpose of a Science-Based Vessel Management Plan is to develop laws and guidelines based on credible and validated acoustical data. The PWWA believes the following alternatives represent a science-based place to start given the endorsements of relevant experts of this document.

Action 1: Science Panel

A panel of scientists should convene to review the current body of best available science on the acoustics of vessels and potential vessel impacts and to issue recommendations on how to best achieve the goal of a “near zero” acoustic footprint of whale-watching vessels. The panel can be convened jointly by PWWA and WDFW and include experienced acoustic and SRKW experts and could be chaired by acoustic experts such as Dr. David Bain and Dr. Val Veirs.

Action 2: Permit System

A permit system shall be created by WDFW with PWWA consulted as a key stakeholder. A panel of scientists will convene to advise WDFW on the creation of the permit system. The purpose of the permit system is to cap an industry that currently has no restrictions on growth. Further restrictions will be added as terms of the permit, so that under permit, a Science-Based Vessel Management Plan may be implemented instead of many individual laws.

Action 3: Near Zero** Acoustic Impact

One restriction under the permit will be to determine an acceptable number of vessels, based on acoustic properties, present with SRKW that does not exceed acceptable acoustic thresholds. These acoustic thresholds will be determined by using the best available science. Where gaps in the science are present, the PWWA will voluntarily engage with WDFW and/or NOAA and/or independent scientists to conduct studies to fill these data gaps in order to determine an acceptable acoustic threshold. It has been suggested that the current guideline created by PWWA restricting no more than 10 vessels operating in a 1km Go-Slow Zone may already achieve a “near zero” acoustic footprint. As a precautionary measure, PWWA suggests decreasing this number to a maximum of 5 vessels in the 1km Go-Slow Zone until analysis on the acceptable acoustic thresholds occurs.

**Definition of Acceptable Acoustic Threshold or “near zero” vessel acoustic footprint: PWWA suggests the convened scientific panel define this. It has been suggested that the “near zero” acceptable acoustic footprint is a point at which vessel noise merges with ambient noise and any potential impacts on echolocation are not present.

Action 4: No Go Zone

Codify our No Go Zone of ¼ mile off the west side of San Juan Island Cattle Point to Mitchell Point. (Recommendation 28 Option A). This will apply to all vessels (except kayaks) when SRKW are present. Simultaneously, have the science panel review recent (last 10 years) sightings and behavioral data to determine if there is an additional region it makes sense to protect as an important foraging no-go zone for SRKW either seasonally or year-round.

Action 5: Go Slow Zone

Codify our Go Slow Zone of speeds of 7kts or less 1 km around SRKW at all times (modified Recommendation 28 Option B). This will apply to all vessels at all times.

Why does this Science-Based Vessel Management Plan provide more protection than a moratorium on watching Southern Resident Killer Whales?

The moratorium was introduced in response to a lack of consensus on Recommendation 28. Recommendation 28 was created to respond to concerns about potential vessel acoustical impacts in foraging areas for SRKW. This alternative proposal will allow PWWA to continue its contributions to stewardship, research, education, and conservation that would be negatively impacted by the proposed moratorium. Moreover, the alternative approach, in combination with existing PWWA guidelines, will offer more benefits to the SRKWs than Recommendation 28. The SBVMP described above offers further protection by:

1. Establishing an acoustic threshold based on best available science that achieves “near zero” acoustic footprint of whale watching vessels. This mitigates the biggest concern for SRKW which is the potential masking of their echolocation by vessel sound, therefore making it difficult to find prey. The presence of professional whale watch operators adhering to this threshold will increase compliance of other vessels, thus reducing overall acoustic impacts.
2. The adaptive strategy of a SBVMP allows scientists to determine what acoustic thresholds are acceptable. It also allows the whale watching industry to adapt to new science. For example, once thresholds are determined, PWWA members can adapt over time, if necessary, to quieter propulsion systems. In order to achieve “near zero” acoustic footprint, other solutions could be presented such as “engine off” zones, or silent electric propulsion only zones. Adaptive management allows the industry to still participate in educational tours while meeting the acoustic requirements.
3. The SBVMP allows whale watch vessels to continue their stewardship of whales on the water, while also preventing serious acoustic disturbance or harassment. WDFW officers and other professionals support the whale watching industry as models of good behavior around whales, and rely on PWWA as a source of information on whale location and identities. In an environment with many vessels when whales are present, the professional operators under permit can be used as a beacon for other vessels to indicate whales are present and that they need to slow down. It’s possible that in the future, under this permitting system, that only professional vessels could enter the quiet 1km zone. Soundwatch data under NOAA permit and WDFW enforcement data shows that professionally trained PWWA whale watch vessels show strong compliance to all regulations and guidelines. Private vessels on the other hand commit over 90% of the “dangerous” infractions such as high-speed passes and close pursuits of whales. PWWA members can help define that permitted 1km zone through flagging and informing enforcement on SRKW location, preventing these dangerous incidents.

4. The SBVMP allows whale watch vessels to continue helping the valuable research that informs the recovery strategy. Over 90% of SRKW sightings to researchers and enforcement flow from the PWWA. As SRKW use their core habitat in new ways, as they have shown over the last 15 years, it's not possible for researchers to know about their presence because it's become so scattered and unpredictable. The PWWA has become the key provider of this information, making the continued monitoring of SRKW health possible. The research community, scientists, law enforcement, boater education programs and military have come to rely on PWWA to provide ongoing and current sightings data.
5. The SBVMP allows whale watch vessels to continue their valuable contributions to education and conservation. Professional whale watch companies have created conservation programs and are working toward establishing further conservation connections with other partners. Professional whale watch companies educate an estimated 600,000 guests annually. Each guest receives information on how to help recover SRKW, a message that is more powerful when seeing the SRKWs.

The Science-Based Vessel Management Plan (SBVMP) is an alternative plan to the proposed SRKW moratorium. The proposed moratorium has little broad-based support across the scientific community. The SBVMP on the other hand has broad consensus in the scientific community. Most importantly, it addresses the most important vessel issue concerning SRKW and that is the potential acoustic disturbance and masking of echolocation. It also allows for continued protection by being a signpost on the water, supports the continued research of SRKW, and provides valuable education, outreach, and conservation actions that help recovery.

Additional potential actions to strengthen PWWA's conservation role and minimize vessel effects:

- Train all PWWA vessels/captains in oil spill response
- Get all PWWA companies involved in the whale flag program and require usage when vessels are within 1km of whales to further assist with public visibility of whale locations
- Commit to discussing SRKW and how the public can be involved in their conservation on every trip regardless of which type of whales are seen.
- Take a leadership role in the PodMatch app being developed by Whale Scout. Podmatch is an application designed to connect individuals to salmon recovery projects and organizations.
- Develop a mechanism to track how visitor outreach results in action to benefit whales, and make continued adjustments to educational programs to increase results based on studies.

Individuals and Organizations That Support the Science-Based Vessel Management Plan over Recommendation 28

The SBVMP was developed in collaboration with and/or is supported by:

Dr. David Bain	Orca Conservancy
Shari Tarantino	Orca Conservancy
Ken Balcomb	Center For Whale Research
Michael Weiss	Center For Whale Research, University of Exeter
Dr. Darren Croft	Center For Whale Research, University of Exeter
Dr. Rich Osborne	Joyce, WA (Vessels Working Group Member)
Dr. Val Veirs	Beam Reach Marine Science and Sustainability School
Dr. Debbie Giles	Friday Harbor, WA (Vessels Working Group Member)
Julianna Houghton	MS, SAFS, University of Washington
Dr. Andrew Trites	Marine Mammal Research Unit, University of British Columbia
Whitney Neugebauer	Whale Scout
Dr. Julie Woodruff	Orca Behavior Institute
Monika Wieland Shields	Orca Behavior Institute
Sara Hysong-Shimazu	Orca Behavior Institute
Cindy Hansen	Orca Network
Susan Berta	Orca Network
Howard Garrett	Orca Network
Steering Committee	Salish Sea Ecosystem Advocates

Appendix 6. Public comments

All public comments received to date are available in this folder and its sub-folders:

<https://pspwa.box.com/s/2n27cmx09vec2iz6ia3n4ietcij1smo1>

Public comments were welcomed throughout the process and will continue to be accepted until the task force finishes its work in October 2019. This appendix provides the summaries created for task force members following two specific public comment periods in 2018.

Public comment on the September 24 draft report

There were 3,405 responses to the public comment survey on the governor’s website about the September 24 draft report and draft recommendations. (Note: There were 2,948 unique IP addresses and 458 duplicates. Duplicates can be due to multiple people in a household or at a public institution submitting individual comments. There could also be some people who responded to the survey more than once.)

Organizations and coalitions also submitted letters; links and summaries are available in the second section of this document.

Individual comments

The full set of comments received through the online survey can be found at

<https://pspwa.box.com/s/hzq6yings8w8ju8o4cob18k4jj1u5k91>.

Vision and goals

- Many people voiced support for the vision and goals statements.
- Several people (8) said that the vision and goals should have a greater emphasis on speed and include immediate goals for 2018 and 2019.
- A few people expressed concern that the draft recommendations wouldn’t be enough to achieve the vision and goals.
- Some people mentioned specific actions that they wanted to see in the goals statement (e.g., dam removal).

Habitat

There were 1089 responses in the habitat comment box; 627 responses were ambiguous or not related to habitat. Themes related to habitat include:

Themes	Comments	% of total
Restore/acquire habitat	239	21.9%
Protect habitat with regulations	167	15.3%
Fish passage at dams and culverts	25	2.3%
Improve water quality	10	0.9%
No new regulations	7	0.6%
New action ideas (see below)	5	0.5%
Cooperative compliance programs	4	0.4%
Do not invest in habitat	3	0.3%
Study/assess/inventory	2	0.2%

New, potentially worthwhile habitat ideas to save for the Year Two list:

- “We could have a New New Deal, providing high quality green collar jobs while expediting stream and estuary restoration.”
- “Nutrient Enhancement Program statewide would dramatically improve watersheds and fisheries.”
- “A Salish Sea protected zone would be one of the first of its kind.”
- “All state agencies with land ownership or management responsibilities (WSF/WSDOT, WA Parks, WDFW, WDNR) shall inventory and implement pollution control, contamination cleanup, habitat protection and restoration to benefit forage fish, Chinook Salmon and SRKW. Funding for this work will be incorporated in the agency budgeting process.” (2)

Hatcheries

842 total comments were tallied below from 534 total individuals that commented on hatcheries.

Themes	Comments	% of total
Prioritize wild salmon recovery actions over hatchery fish	211	25.1%
Support increased hatchery production	164	19.5%
Hatcheries can negatively impact wild salmon, take precautions and monitor increased hatchery production	120	14.3%
Do not support increased hatchery production	102	12.1%
Support hatchery production as a temporary measure only	87	10.3%
Habitat, forage fish and ecosystem health actions must go with hatchery production	75	8.9%
Concern that increased hatchery production means more Atlantic salmon or fish farms	32	3.8%
Concern over hatchery fish that may have contaminants or diseases	20	2.4%

Concern about resulting fisheries, including more harvest and who will benefit	18	2.1%
Support only doing pilot hatchery studies now, with increases later	10	1.2%
Support the use of all H approach	3	0.4%

Hatchery comments:

- The most common comment received was a statement of support for natural/wild fish recovery (25.1% of comments) over hatchery-produced fish. While some of those people went on to say that they did not support increased hatchery production because of this (12.1%), others supported increased production that was careful to minimize impacts to wild fish stocks (14.3%) and/or was a short-term measure (10.3%) for orcas while wild stocks recover. In particular, some people suggested that careful reviews of hatchery impacts should be conducted and that the increased production would have to be reauthorized with this information in 10 years.
- Several commenters noted that they were concerned that hatchery operations might be funded at the expense of protecting and restoring wild salmon, and many stated that hatchery production must come with investments in habitat, forage fish and ecosystem health (8.9%).
- On the other end of the spectrum, a few commenters expressed their desire for more Chinook fish of any kind (hatchery or wild) and that wild fish genetics and recovery are less or not important.

Confusion about specific hatchery actions or recommendation language:

- A large number of individuals were concerned that the potential recommendation suggested that increased hatchery production would not occur until 2020, which was too slow to address Southern Resident needs. Two pieces of information need to better be explained around this recommendation: 1) WDFW has already begun increasing hatchery production to some level with state money that was received for fiscal year 2019, and 2) More details are needed to explain that it will be 3-5 years before orcas potentially see adult fish prey increases here in Washington after increased production due to their lifecycle.
- Several people were concerned that increased hatcheries meant that Atlantic salmon would be farmed, or that more fish farms would come to Washington. We need to provide a better explanation of hatcheries for the public that is not familiar with them, including that only native salmon species are produced and about how hatcheries function differently than fish farms.

Ideas that the task force might consider as a point of clarification:

- A focus on conservation hatcheries rather than production hatcheries should be first and foremost, with assurances of minimization of genetic weakening of wild stocks.
- There needs to be an increase in hatcheries coordination with Canada.

New, potentially worthwhile ideas to save for the Year Two list:

- We should have hatcheries for the salmon's food source too. (This idea of ‘forage fish hatcheries’ was discussed by the Prey Working Group but is an action that needs much more research.) Also noted under forage fish below.
- Include educational programs to increase awareness. Make sure the public is aware of hatchery production and why it's important by encouraging hatchery tours, school tours.
- Offering a license discount to sport fishermen as an incentive to work in a hatchery will benefit everyone.

Hydropower

There were 994 responses in the hydropower comment box; 189 responses were ambiguous or not related to hydropower. Themes related to hydropower include:

Themes	Comments	% of total
Breach the lower Snake River dams	365	36.7%
Do not breach the lower Snake River dams	118	11.9%
Prioritize and remove dams in general Includes comments related to: Remove dams on the American Rivers list Remove dams like the Pillchuck Support for recommendation 1 (regions and partners develop a list of dams to remove in agreement with partners) Dams that block salmon and degrade habitat need to be addressed	103	10.4%
Third party facilitator	61	6.1%
Support ongoing NEPA process	50	5%
Reestablish salmon runs above dams	33	3.3%
Restore passage at all dams	33	3.3%
Don't increase spill	23	2.3%
Increase spill	19	1.9%

Harvest

531 total comments were tallied below from 442 total individuals that commented on harvest.

Themes	Comments	% of total
Support closing fishing for one, multiple years or moratorium	115	21.7%
Support harvest reductions	113	21.3%
Support closing important foraging areas	53	10.0%
Support a buyback program for gear or commercial fisheries	38	7.2%
Concern about tribal fishing rights or fishing allocations	35	6.6%
Do not support commercial fishing	30	5.6%
Would like to see an allowance/allocation for orcas specifically in season setting	24	4.5%
Concern that 'real time' closures won't be fast enough to benefit the orcas	22	4.1%

Encourage collaboration with Canada and/or OR on harvest reductions	22	4.1%
Concern about impacts to fishing stakeholders due to foraging area closures	19	3.6%
Support bycatch reduction	18	3.4%
Support getting people to not eat salmon or limit sales of WA-caught salmon	17	3.2%
Do not see harvest reductions as beneficial to orcas	13	2.4%
Do not support buyback programs and want to protect commercial fisheries	9	1.7%
Uncertainty about what a buyback program is	3	0.6%

Harvest comments:

- The most common comments received were statements of support for closing fishing for one year, five years, ten years or a moratorium (21.7% of comments) and statements of support for further reductions in harvest to benefit the Southern Residents (21.3%). Many people commented that they did not feel that the potential recommendations were strong or bold enough to make a difference for the orcas.

Confusion about specific harvest actions or recommendation language:

- While 10% of comments supported closures of foraging areas for orcas, 4.1% of comments expressed concern that closures that occurred within days of detecting orcas would not be fast enough to benefit them. This shows that a better description of how such a real-time mechanism would work is needed in any potential iterations of that recommendation.

Ideas that the task force might consider as a point of clarification:

- One commenter stated that closures to important foraging areas “should include a stakeholders component in the development AND enforcement. I believe the local community using commercial and residential fisheries should work together with WDFW to police this and without those details I do not support.”

New, potentially worthwhile ideas to save for the Year Two list:

- Slot size limits was suggested by a commenter and was previously on the Prey Working Group list. If the task force wishes, more information could be brought forward on the pros and cons of such an approach in Year Two.
- Multiple commenters suggested that instead of or in addition to a buyback program, a limited entry commercial fishing permit system could be developed based on longevity in the fishery.
- Several commenters stated that they felt harvest could be changed or curtailed by not buying Chinook. Some wanted a public information campaign and another commenter suggested: “I have heard conflicting messages about whether consumers should buy Chinook salmon, and whether or not this would benefit SRKW. I suggest a factsheet on this issue would help.”

- Similarly, multiple individuals suggested limitations on the sale of WA State commercially caught salmon, limited to markets in the continental United States. They stated that Hawaii recently passed a similar bill limiting the sale of billfish.
- Other individuals wanted a slightly different campaign such as “State government must establish and forcefully communicate the positive economic effects of a robust Orca population and a safe, reasonable and sustainable salmon harvest.”

Predation

856 total comments were tallied below from 551 total individuals that commented on predation.

Themes	Comments	% of total
Do not support lethal removal of pinnipeds	198	23.2%
Predation of salmon by pinnipeds is not the primary issue for orcas	159	18.6%
Support lethal removal of pinnipeds	148	17.3%
Concern with interfering with Mother Nature's balance/did not want species by species management	80	9.4%
Expressed that not enough information available to support potential recommendations	71	8.3%
Support haul out removal	64	7.5%
Urge the consideration of transient orca needs	52	6.1%
Support lethal removal of predatory fish	47	5.5%
Support lethal removal of salmon-eating birds	23	2.7%
Support protection of pinnipeds	10	1.2%
Support increasing forage fish to aid predation issues	3	0.4%

Predation comments:

- The most common comment received was a lack of support for lethal removal of pinnipeds (23.2% of comments) with many people expressing that predation is not the major threat to address for Southern Resident recovery (18.6%).
- A nearly comparable number of comments (17.3%) expressed their support for lethal removal of pinnipeds. Fewer commenters stated that they supported lethal removal of predatory fish (5.5%) or birds (2.7%).
- Several people noted their concern for transient orcas if lethal management of pinnipeds were to occur (6.1%).

Confusion about specific predation actions or recommendation language:

- Several people commented that they did not know what a pinniped was and suggested that either a definition accompany the recommendation or that other terminology be used in the next version of the report.

Forage fish and marine productivity

There were 366 responses in the forage fish comment box; 156 responses were ambiguous or not related to forage fish. Themes related to forage fish and marine productivity include:

Themes	Comments	% of total
Restore forage fish habitat	100	27.3%
Inventory/monitor/study forage fish	49	13.4%
Protect forage fish habitat	26	7.1%
Stop harvest of forage fish	23	6.3%
No more studies	8	2.2%
New ideas for forage fish actions (see below)	4	1.1%

New, potentially worthwhile ideas to save for the Year Two list:

- Using hatcheries to produce forage fish. (2)
- Education to encourage youth to enter the field; perhaps a mentor program for high schoolers.
- Reintroduce herring.

Vessels

We processed 1,881 comments on vessels.

Major themes (hundreds of entries):

- Need to further evaluate and engage with US Navy (and other military and Canada) on training and tests related to sonar and other exercises (more than 300 entries).
- Improve oil transportation safety, response and accountability (more than 200 entries).
- Need for vessel noise reduction is urgent (more than 150 entries).
- Support for a moratorium or marked restriction on commercial (and recreational) whale watching (more than 110 entries).

Minor themes (tens of entries):

- Slow down ships to mitigate noise, ship-strikes and oil spill risk (more than 80 entries).
- Create permanent exclusion zone for prime feeding areas (more than 40 entries).
- Amplify enforcement penalties for egregious non-compliance using citations and greater fines (more than 30 entries).

Contaminants

Processed 600 comments related to contaminants.

There was significant general support for all of the contaminants recommendations. Some respondents thought that contaminants actions should be prioritized behind other actions—but there was not substantial agreement on that.

Key themes under contaminants:

- **Human health benefits.** The most common theme from the contaminants comments was concerning the human health benefits of addressing contaminants. 50 commenters highlighted the human health benefits, the general idea being ‘what’s good for the whales is good for us.’
- **Urgency.** The next most frequent response (39 individual comments) was an imploration to act quickly to address contaminants.
- **Action-oriented.** 19 commenters expressed that they would prefer to see actions—not studies or monitoring—however another 14 comments expressed support for science and monitoring
- **Funding.** One major theme related to funding was that polluters should bear the cost of contaminant action (14 individual comments). Another funding theme opposed new funding, some commenters asking that existing funds be reprioritized to address contaminant actions (13 comments).
- **Sewage and wastewater.** A number of commenters expressed concerns with raw sewage from Victoria (7) and sewage generally (8).
- **Additional issues of concern.** Commenters raised a number of issues for the task force and Contaminants Work Group to address:
 - International coordination (12 comments)
 - Pesticides (10 comments)
 - Plastics (6 comments)
 - CECs (4 comments)
 - Fish farms (3 comments)
 - Hatchery PCBs (3 comments)

Overarching comments

- **Urgency.** More than 120 respondents focused their final comment on the urgency of the situation and the need to take bold action now. This was in addition to respondents who emphasized the need to take a particular action now (e.g., removing dams). Sample quotes:
 - “There is little time left for us to save this community of orcas, and we hope bold, effective actions will happen quickly, to save these Pacific Northwest iconic orcas and salmon from extinction.”
 - “The magnitude of this problem requires bold and swift action. I encourage the task force to aim high and ask for solutions that really will make a difference for the survival of these whales.”

- “Please do everything in your power to save the orcas now.”
- Several people urged the task force to utilize the best available science.
- Several people asked for clearer wording on the recommendations.
- Respondents could select the top 5 things that think should be done (from the Year One draft recommendations or the additional potential actions in the appendix). The ones with the most votes were:
 - Habitat #1 (12%). (Potential habitat recommendation 1: In 2019, the governor and legislature should provide funding to the Recreation and Conservation Office to support habitat acquisition and restoration projects through existing capital budget salmon recovery accounts...for the subsequent round of funding with no changes to existing ranked lists...additional detail in Sept. 24 draft report.)
 - Hydropower 15 in the appendix (6.3%). (Potential hydropower action 15: Advocate that the US Army Corps unilaterally make a decision to stop operating the Lower Snake River dams and seek authority to breach the dams in near-term. Work to develop a mitigation package for affected communities and stakeholders, and to fund necessary hatcheries and habitat actions in the absence of mitigation funding depending on dam operations. Work to ensure the dams’ energy is replaced with carbon-free alternatives.)
 - Hydropower #13 in the appendix (4.5%). (Potential hydropower action 13: Support the removal of dams that are on the American Whitewater list. The dams identified for removal in the next one to three years are Middle Fork Nooksack Diversion Dam on the Middle Fork Nooksack River, Pilchuck on the Middle Pilchuck River, and Nelson Dam on the Naches River. In the next four to five years, the list recommends removing Chambers Creek Dam on Chambers Creek and Enloe Dam on the Similkameen River.)
 - Harvest #1 (4.4%). (Potential harvest recommendation 1: The governor should direct WDFW to collaborate with tribes to analyze the feasibility, logistics and costs/benefits of developing a buyback program to remove fishing gear that has high release mortality of Chinook and/or transition to gear that has lower cumulative Chinook mortality. Complete the analysis by December 2019... additional detail in Sept. 24 draft report.)
 - Habitat #2 (4.3%). (Potential habitat recommendation 2: In 2019, the governor should request that the legislature create a new, large-scale, multiple-benefits estuary-specific capital program and identify revenue sources... additional detail in Sept. 24 draft report.)
 - The vessel actions with the most votes were Vessel #13 (address ongoing vessel safety issues, including oil transport) and Vessel #1 (statewide “go slow” bubble for vessels operating within ½ nautical mile of orcas).

- The contaminant actions with the most votes were Contaminant #1 (accelerate implementation of the ban on PCBs in state-purchased products) and Contaminant #5 (accelerate effectiveness, implementation and enforcement of NPDES permits).
- Note that half of respondents chose not to answer this question, as it was long and time-consuming.

Organization/coalition comments

Organizations and coalitions submitted the following letters commenting on the draft report and recommendations. They can all be found in this Box folder:

<https://pspwa.box.com/s/0xt6ruk2mi1otygoty9frz4iieriw399> and specific links to each letter are also provided below. The draft report with the recommendations numbered as referred to below can be found at https://www.governor.wa.gov/sites/default/files/SRKWDraftReport_09-24-18.pdf.

Council of Regions (representing the 7 regional recovery regions in WA):

<https://pspwa.box.com/s/hmdfsjppmx9wal1hzbhjk5q9yqdk624> Recommends relying on (and potentially expanding) the existing regional salmon recovery plans and frameworks, fully evaluating proposed actions for unintended consequences and coordinating with recovery regions before hatchery management decisions are made, fully considering the complexity of orca and salmon recovery across different scales, and coupling any short-term actions with those that will produce long-term and sustainable benefits.

Stand Up to Oil Coalition: <https://pspwa.box.com/s/fc82rmfurt2expod28e8pxord89lmnzc>

Strong support for Vessels #8, strong support for Vessels #13, and support for Vessels #5 with recommended changes/new language.

Toxics-Free Future: <https://pspwa.box.com/s/2urvf7nblfrt1ptxj5xe55utg6zn5ww1> Letter with signatures of 293 people strongly emphasizes support for Contaminants #2 and Contaminants #3.

Oceana: <https://pspwa.box.com/s/5cobn0fla0yq89xxkab8o2i9misw05vk> Supports Hydro #1, Hydro #2, Hydro #4 (with modification), Hydro #5B (with modification), Habitat #1, Habitat #2, Habitat #3.

Bonneville Power Administration: <https://pspwa.box.com/s/qieyuxr5siagp74jxfdueri4qkh7wl30>

Supports Habitat #1, Habitat #2; provides comments on hatchery and hydropower recommendations; recommends Hydro #5A.

The Lands Council: <https://pspwa.box.com/s/ez5e72ldry5mds40494ks84rf543xnwn> Supports Habitat #1, Habitat #2, Habitat #3, Habitat #6, Habitat #8, Hydro #2, Hydro #5B, Hydro #4 (in the absence of or prior to removal), Harvest #3, Harvest #5, supports removing barriers and limiting commercial harvest, opposes lethal management of pinnipeds.

Center for Biological Diversity: <https://pspwa.box.com/s/6j6l951bdlr2lsydb9ooow62dauzw97p> Supports Vessels #4, Vessels #7A and 7B, Vessels #6, and urges that restrictions be in place by May 1, 2019. Also provided comments from 790 people

(<https://pspwa.box.com/s/uj6man5u5zpcpp64s7w1oh9ceunyzvax>), many prioritizing: 1) restoration of wild Chinook salmon populations, 2) limiting allowable catch and avoiding all bycatch, 3) considering dam removal, 4) establishing “no go” zones for vessels and a limited-entry permit system for commercial whale-watching vessels, 5) improving water quality and reducing toxics. Opposes any changes to the MMPA that would allow killing harbor seals or sea lions.

3 members of the Senate Republican Caucus:

<https://pspwa.box.com/s/tnddh3rhevgecy1g8h87qh7nsjuwop4a> Letter from Sen. Schoesler (9th district), Sen. Brown (8th district), and Sen. Warnick (13th district) adamantly oppose any recommendations that promote dam breaching or removal and provides comments on other potential hydropower recommendations.

Earthjustice: <https://pspwa.box.com/s/csmolse7ne1vsbenz2rkpxcmhwx9hcb> Supports Hydro #5B, Hydro #4, Hydro #2, Habitat #1, Habitat #2, Habitat #3. Recommends adding a new Habitat action (replacing the “no-net-loss” policy in the GMA and SMA with an “ecological-net-gain” policy) and a new Hydro action (directing state agencies to use SEPA to evaluate the potential impacts of new dam projects on salmon availability for the Southern Residents). Signed by 17,480 individuals; 3,469 of those also submitted personalized comments that are appended to the letter.

The American Waterways Operators:

<https://pspwa.box.com/s/1eqa3256fu9kp65gvbwxqm24g8aki5am> Concerned that Hydro #4, Hydro #5A, Hydro #5B, as well as Hydro Actions 15 and 16 (in the draft report appendix) would be prohibitively costly and would not produce the desired results. Concerned about Vessel #8 and Vessels #13.

Washington State Association of Counties’ Coastal Caucus:

<https://pspwa.box.com/s/aslu7xgszoe10iwcxenpfsh3oow5qrm> Includes comments on Habitat #1 (support), Habitat #3 (needs participation of local governments), Habitat #5 (needs participation of local governments), Habitat #6 (needs participation of local governments), Hydro #2 (support), Forage fish #1 (support), Hydro #5B (if the discussion is to be pursued, counties support a neutral venue), Vessels #13 (support). The Counties do not agree with Contaminants #5 or Contaminants #6 if they come without funding.

Washington Environmental Council:

<https://pspwa.box.com/s/uwllv6o4680uzrt6ddrnbwq079wf74gd> 2,584 comments from WEC members and public that include: thanking the task force for their passion, commitment, and leadership; potential Year One actions will help but aren’t enough; support for all Contaminants actions; emphasize increasing food in the short-term while investing in long-term ecosystem recovery and making any increases in hatchery production for the benefit of SRKWs only; need to make sure there is funding for the bold actions.

Orca Salmon Alliance: <https://pspwa.box.com/s/js48xag213dwuaumchr47yqlipuy815d> Joint comments on each of the specific draft recommendations as presented by OSA’s 15 members: *Orca Network, Defenders of Wildlife, Save Our Wild Salmon, Washington Environmental Council, Oceana, Natural*

Resources Defense Council, Sierra Club, Earthjustice, Endangered Species Coalition, Whale and Dolphin Conservation, Puget Soundkeeper, Center for Biological Diversity, Seattle Aquarium, Whale Scout, and Toxic Free Future.

Recreational Boating Association of Washington:

<https://pspwa.box.com/s/ztxc654pohyrouy2ur9uah01nk5ys6ld> Expresses concerns and opposition to potential Hydro action #13 calling for a removal of a series of hydropower dams, #16 calling for the removal of the Lower Snake River dam, and #12 on developing a list of priority projects for potential removal. Concerns include loss of recreational opportunity and loss of existing paid-for infrastructure.

Association of Washington Cities:

<https://pspwa.box.com/s/g1m0w1ufmy6ckxbhkvnr0f75zqb7s3f1> Supports removing culverts to provide access to important Chinook habitat. Unsure how Contaminants #5 and #6 would result in any benefit given recently concluded work by Ecology. Encourages bold thinking on funding for Contaminants #7 and encourages assessment of where retrofits would make a critical difference.

American Rivers: <https://pspwa.box.com/s/9tkol8kv2mqgrxqibxyaauv773ao8pbd> Supports all of the potential habitat recommendations; suggests amendments to Habitat #1, Habitat #3, Habitat #8; requests an additional habitat recommendation replacing the “no-net-loss” policy in the GMA and SMA with an “ecological-net-gain” policy; supports all potential hydropower recommendations and suggests amendments to Hydro #2 and Hydro #5B.

Regional Fisheries Coalition: <https://pspwa.box.com/s/63iy7htf9zrz7rit3brt3x5ranzdop1> Comments on Habitat #1, Habitat #2, Habitat #7, Forage Fish #1. Encourages increasing funding for the capacity of the organizations that we need to work on implementing salmon recovery, and including a recommendation to streamline the process from a project idea to project completion.

Northwest Sportfishing Industry Association:

<https://pspwa.box.com/s/960xwh55ah6h28fn2b979y2dpo5rfaxa> Provides specific comments on Habitat #1-6, with general support and some suggested edits to #3. Requests an additional habitat recommendation replacing the “no-net-loss” policy in the GMA and SMA with an “ecological-net-gain” policy. Provides comments on Hatchery #1C and requests an additional hatchery recommendation on increasing production of spring Chinook in lower Columbia River SAFE programs. Prioritizes Hydro #4, comments on Hydro #2, and proposes combining #5A and #5B into one action. Supports Harvest #2, Harvest #3, Harvest #5, comments on Harvest #4. Supports Predation #1A, Predation #2A, and Forage Fish #1.

Environment Washington: <https://pspwa.box.com/s/mt6pdddddj8g7ujb2vww631djvx7gcjl> Has about 280 signatures. Urges strengthening and adopting Hydro #5B, Hydro #4, Hydro #2, Habitat #1-3. Requests an additional Habitat recommendation replacing the “no-net-loss” policy in the GMA and SMA with an “ecological-net-gain” policy. Requests an additional Hydro recommendation (directing state agencies to use SEPA to evaluate the potential impacts of new dam projects on salmon availability for the Southern Residents).

Skagit Watershed Council: <https://pspwa.box.com/s/b227lk66n95tk2afdj1bnzfg0a1ngt3h>
Strongly supports Habitat #1 (with modifications), Habitat #2 (with modifications), Habitat #7 (with modifications), Forage Fish #1. Recommends focusing boldly now on habitat protection and restoration.

Marine Mammal Commission: <https://pspwa.box.com/s/7ck3sld3hej4zb3ehn2ljmpnb89r43tq>
Supports Hatchery #1C, Hydro #2, considering actions to implement local harvest controls at critical times; comments on Predation #1A and #1B and supports inclusion of a cautious pilot; supports Vessels #4 and #13 (both with comments); suggests re-ordering and clarifying Contaminants recommendations. Notes that the task force should better describe an integrated program of activities and specify priority and sequencing as well as baselines and targets.

Save our Wild Salmon: <https://pspwa.box.com/s/k38n7havrervxoctibxlghibupsihieo> Has about 1,300 signatures. Urges strengthening and adopting Hydro #5B, Hydro #4, Hydro #2, Habitat #1-3. Requests an additional Habitat recommendation replacing the “no-net-loss” policy in the GMA and SMA with an “ecological-net-gain” policy. Requests an additional Hydro recommendation (directing state agencies to use SEPA to evaluate the potential impacts of new dam projects on salmon availability for the Southern Residents).

Roza Irrigation District: <https://pspwa.box.com/s/oegdotgq6zb73c300qns74q7b682xdmj> States that near-term actions which can have meaningful benefit to the SRKWs include continuing/maximizing the downstream barging of out-migrating juvenile salmon, accelerating the removal of the Bateman Island causeway, re-starting production at the Ringold hatchery on the Columbia River, and funding promising research projects. Emphasizes that removing the lower Snake River dams will not result in recovery of the SRKWs and will absorb time and resources that could be better invested elsewhere of the benefit of the whales.

Friends of the Earth: <https://pspwa.box.com/s/f3j9hmziv9un3r2gda9vqey4l09cek8c> Notes support for specific actions. Top priorities are Harvest #2, Harvest #7, Vessels #22, Forage fish #21, and Habitat #17.

Pacific Merchant Shipping Association:

<https://pspwa.box.com/s/4vc84i9atuphy3e6f0oads52gjf2syev> Expresses concerns about Vessels #1, Vessels #8, Vessels #13, and offers to provide the task force with a briefing about the safety system in place today.

Washington State Academy of Sciences:

<https://pspwa.box.com/s/gv213f9pepmh1jkb9pm1agnnrpz5rro> Suggests modifications to Vessel #11 (which referenced the Washington State Academy of Sciences) with wording intended to enable the Academy to remain objective and provide options for policymakers. Also includes a sketch of the process and a budget estimate.

Sound Action: <https://pspwa.box.com/s/c38bd8yc9irdeuatvielowo92wj8yn14> Sound Action was represented on the Prey Working Group. Letter urges task force to restore original language of Habitat #3, Habitat #4, Habitat #8 to reflect actual Working Group recommendations.

Northwest Straits Commission: <https://pspwa.box.com/s/p5956cojye97lvddw66grcf940qk1x5y>

Supports an emphasis on funding programs and projects that address nearshore restoration/protection, forage fish and zooplankton studies; protection and restoration of key marine vegetation habitats; need for increased public awareness about the Southern Residents by prioritizing and expanding Forage Fish #9. *Note: Not on letterhead because this was received through the online comment form.*

Snoqualmie Watershed Forum: <https://pspwa.box.com/s/681fw9dlev1kwidy1cqghe8fba2fhcwo>

Supports all 8 habitat recommendations and suggests more specific wording; supports all draft forage fish and all contaminants recommendations; comments on hatchery recommendations. Encourages task force to acknowledge climate change is causing species to migrate (related to predation). Would like to see recommendation limiting commercial offshore mixed stock fisheries in waters where adult Chinook are caught before orcas can feed on them.

Defenders of Wildlife: Letter: <https://pspwa.box.com/s/oiwzj36clg4e2d8hp84nx8hkoc8qtrfe>

Indicates level of support for all potential recommendations; top 5 actions are Habitat #2, Habitat #3, Hydro #2, Hydro #4, Hydro #5B. Opposes Predation #2A. Recommends adding a new Habitat action (replacing the “no-net-loss” policy in the GMA and SMA with an “ecological-net-gain” policy) and a new Hydro action (directing state agencies to use SEPA to evaluate the potential impacts of new dam projects on salmon availability for the Southern Residents). Petition signed by ~900 people: <https://pspwa.box.com/s/330llix6tfj4wn4s9jqd0hfv2bbijr5d> Consistent with what is noted above and also calls out support for Habitat #1.

Palouse Regional Transportation Planning Organization:

<https://pspwa.box.com/s/yv2e9xneqrthpz6796pwz140cltzhhd0y> As a regional transportation planning organization, strongly recommends looking at all possible issues thoroughly before making any decisions towards dam breaching. Presents the transportation perspective (barge transportation throughout the Columbia River System).

Columbia County Commissioners:

<https://pspwa.box.com/s/wbvjvxlxt6x9p8azrg2u1ybjgrreo1t> Supports funding for certain capital projects as long as not in place of other needed projects in the state that have been vetted and are awaiting action; comments on impacts of out-migrating smelts from birds and nonnative fish, and on returning adults by seals and sea lions; says it’s time to address untreated sewage; says the Snake River Dams are off-limits to them in any conversation that suggests their removal or compromise, and that there are improvements that could make a huge difference.

The Nature Conservancy: <https://pspwa.box.com/s/ctf61vxs4xkdrddlyeoqsomfd9b6s9y0>

Expresses support for Habitat #1, Habitat #3-5, Habitat #7, Hydro #2, Vessels #8, Vessels #13, Contaminants #7, and strongly encourages funding goals and habitat recovery targets to be added to the habitat recommendation. Additional suggestions for Year One or Year Two in the letter.

Swinomish Indian Tribal Community:

<https://pspwa.box.com/s/fbjpbx0tfnhn2hsrdoc46ng4y1dmybst> Offers comments in advance of a

requested government-to-government consultation. Says we absolutely must take action to set aside and plant riparian buffers that will provide fully functioning habitat for salmon. Provides a response to each of the 8 draft habitat recommendations.

Okanogan Public Utility District:

<https://pspwa.box.com/s/9dg93mdfb632xz0kb2jru7omoxva3wgy> Requests that references to Enloe Dam be removed from the final report (see Hydro #13) and provides the rationale.

Oregon Department of Fish and Wildlife:

<https://pspwa.box.com/s/gp21vlyij8fo0gkfk554wbcs4rxegfwu> Requests inclusion of language on appropriate coordination between ODFW, WDFW, and other entities (e.g., under Habitat #2). Comments on Hatchery, Hydropower, Harvest, Predation recommendations.

Note: Many of these and other organizations also submitted comments using the online survey. All survey responses are available at <https://pspwa.box.com/s/hzq6yings8w8ju8o4cob18k4jj1u5k91>

If any links to organizations' letters have problems, the letters can all be found in this same Box folder: <https://pspwa.box.com/s/0xt6ruk2mi1otygoty9frz4iieriw399>

Sent after Sept. 24-Oct. 7 public comment period on draft report:

Western States Petroleum Association:

<https://pspwa.box.com/s/47b8sjpv6sdjue6wbxwjxdc2kp4u2tcf> Requests that Vessel #13 not be included in the report and instead allow the process created by SB 6269 to complete its work.

Yakima Basin Fish & Wildlife Recovery Board:

<https://pspwa.box.com/s/kh8i53a1e6fk8pv7oh4fz3km9ercr758> Expresses strong support for Habitat #1 and comments on Habitat #2 and other habitat actions. Supports Hydro #2 and Hydro #3, with comments; prefers Predation #2A over #2B; supports Predation #3; encourages inclusion of Hydro action #10.

Letter from 6 orca scientists: <https://pspwa.box.com/s/cv1juj4hd6zc9d0x9bxbllggiplaebim3>

Urges the task force to recommend: 1) changing Washington's water quality standards to allow increased spill to 125% of saturation and 2) convening a process to recommend steps for lower Snake River dam removal as soon as possible.

Public comment on the Oct. 24 draft recommendations

There were 12,720 responses to the public comment survey (on the governor's website) about the updated draft recommendations. Of those, there were 3,898 unique IP addresses. Three IP addresses had more than 400 responses and 21 IP addresses had between 100-399 responses. Duplicates can be due to multiple people in a household or at a public institution submitting individual comments. There could also be some people who responded to the survey more than once.

Organizations and coalitions also submitted letters; links and summaries are available in the second section of this document.

Individual comments

The full public comment survey report is available at:

<https://pspwa.box.com/s/re6npi1hzu76e27975cclc7efyit6wz9>

Attachments and letters from individuals received between 10/24-10/29 via the public survey:

<https://pspwa.box.com/s/oawgw6qh99p0ia12ofquzz06d9owsiwh>

Survey respondents were first asked to indicate their level of support for or opposition to each of the draft recommendations. Results are shown in the charts in the [handout on the governor's website](#).

Voting on top 5 recommendations

Top recommendations, in order:

- 1) Recommendation 9: Determine whether removal of Lower Snake River Dams would provide benefits to Southern Resident orcas commensurate with the associated costs, and implementation considerations.
- 2) Recommendation 8: Increase spill to benefit Chinook for Southern Residents by adjusting Total Dissolved Gas allowances at the Snake and Columbia River dams.
- 3) Recommendation 1: Significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.
- 4) Recommendation 3: Enforce laws that protect habitat.
- 5) Recommendation 6: Increase hatchery production and programs to benefit Southern Resident orcas consistent with sustainable fisheries and stock management, available habitat, recovery plans, and the Endangered Species Act. Hatchery increases should be done in concert with increased habitat protection and restoration measures.

Top prey recommendations: Same as above.

Top vessel recommendations, in order:

- 1) Recommendation 24: Reduce the threat of oil spills in Puget Sound to the survival of Southern Residents.
- 2) Recommendation 18: Establish a limited-entry whale-watching permit system for commercial whale-watching vessels and commercial kayak groups in the inland waters of Washington State to increase acoustic refuge opportunities for the orcas.
- 3) Recommendation 22: Implement shipping noise-reduction initiatives and monitoring programs, coordinating with Canadian and US authorities.
- 4) Recommendation 17: Establish a statewide “Go-slow” bubble for small vessels and commercial whale watching vessels within half a nautical mile of orcas.
- 5) Recommendation 25: Coordinate with the Navy in 2019 to discuss reduction of noise and disturbance affecting Southern Resident orcas from military exercises and Navy aircraft.

Top contaminant recommendations, in order:

- 1) Recommendation 31: Reduce stormwater threats and accelerate clean-up of toxics that are harmful to orcas.
- 2) Recommendation 30: Identify, prioritize and take action on chemicals that impact orcas and their prey.

Habitat

There were 412 comments tagged as being related to habitat.⁴ Of those 412 comments, themes related to habitat include:

Themes	Number of comments
Fund habitat restoration/protection projects in general	107
Increase habitat protection regulations	95
Fund nearshore/estuary/forage fish habitat restoration projects	12
Reintroduce salmon above dams	4

The reviewers’ overall assessment from reading all of the responses that had some mention of habitat was that there was strong support for a combination of strategies to (1) protect whales while they are in the Salish Sea by reducing vessel disturbance and fishing, in combination with (2) enforcing existing regulations and ordinances that are intended to stop habitat loss, contaminants, and water quality while simultaneously (3) restoring and protecting habitat (acquisition) with many references to the importance of nearshore/estuary and forage fish, and (4) restoring fish passage, including above dams that block salmon from accessing suitable upstream habitat. Responses

⁴ Others not in this list either did not have clear habitat content or did not share themes with other habitat comments. Same comment true for the other prey topic areas.

indicated strong support for this suite of synergistic strategies regarding prey availability and vessel disturbance consistent with Lacy’s recommendations that represent a mix of immediate and longer-term outcomes.

Hatcheries

There were 222 comments from 202 survey respondents tagged as being related to hatcheries. Of those comments, themes related to hatcheries include:

Themes	Comments
Support increased hatchery production (without caveats mentioned)	87
Do not support increased hatchery production	48
Fix predation issues while ramping up hatchery production	26
Support hatchery production as a temporary measure only	24
Hatcheries can negatively impact wild salmon, take precautions and monitor increased hatchery production	12
Prioritize habitat conservation	11
Habitat, forage fish and ecosystem health actions must go with hatchery production	11
Support the use of all-H approach	3

The most common comment received related to hatcheries was a statement of support for increased hatchery production, with 39.2% of the 222 hatchery-focused comments stating it outright, 11.7% of hatchery-focused comments only supporting it with predation management measures in place, 10.8% of hatchery-focused comments only supporting it as a temporary measure, 5.4% of hatchery-focused comments only supporting increases done in a manner that will not be detrimental to wild fish, and 5% of hatchery-focused comments mentioning that it should be done with investments in habitat. (72.1% of the 222 hatchery-focused comments supported increased hatchery production in some way.)

The second most common comment received was opposition to increased hatchery production (21.6% of the 222 hatchery-focused comments), with commenters often explaining that they were concerned about wild fish conservation.

Several commenters urged the task force to focus on habitat conservation for longer term wild stock recovery (5.0% of hatchery-focused comments).

Harvest

There were 240 comments tagged as being related to harvest. Of those 240 comments, themes related to harvest include:

Themes	Number of comments
Reduce harvest	74
Ban harvest	72
Eliminate nets/gillnets	21
Fishing isn't the problem	14
Reduce bycatch	12
Consider SRKW in fishing policies	11
Reducing fishing will hurt the economy	10
Better fisheries monitoring	6

Hydropower

There were 8,687 comments on hydro. Due to the magnitude of comments and the short amount of time to assess them, the reviewers read 800 comments (comment 1, 100, 200 and so on until 8,600).

Of the 800 randomly reviewed comments, over 99% were comprised of one of two comments repeated verbatim. Both comments were to request a forum to convene and develop a transition plan to remove the dams combined with increasing total dissolved gas to 125%. One of the comments was provided to its members by Save our Wild Salmon. One commenter also thanked the Sierra Club for instructing the public on how to comment and what to say.

Below are the two nearly identical comments that were submitted verbatim 99% of the time:

- “The science is clear. The lower Snake River dams must go to restore Chinook salmon and save orcas. And stakeholders in Washington must led the way. Please act now to establish a forum for local, state, tribal, and other stakeholders to develop a transition plan for removal of the four lower Snake River dams and restoration of the lower Snake River and its imperiled salmon populations by the end of 2019. You also must ask the Washington Department of Ecology to immediately change state water quality standards that limit the amount of water that can spill past the dams during the critical spring juvenile salmon migration months. The new standards must allow total dissolved gas levels up to 125 percent of saturation as measured at each dams tailraces. Salmon and orcas urgently need increased spill to this new level starting in 2019.”
- “Governor Inslee and Members of the Orca Task Force: Time is short and the science is clear. The lower Snake River dams must go to restore chinook salmon to feed Southern Resident orca and help save them from extinction. Act now to establish a forum for local, state, tribal, and other stakeholders to develop (1) a transition plan for removal of the four lower Snake River dams and restoration of this historic river and its imperiled salmon populations and (2) a timeline for implementing this action. You also must ask the

Washington Department of Ecology to immediately change state water quality standards that limit the amount of water that can be spilled at the dams during the spring juvenile salmon migration months as a critical interim measure to help salmon and orca now. The new standards must allow total dissolved gas levels up 125% of saturation. Salmon - and the orcas that depend upon them - urgently need 'spill' increased to this new level starting in 2019. Thank you.”

Also, in comments that were also tagged under vessels, 18 people included a comment expressing opposition to new dams (such as Chehalis).

Predation

There were 340 comments from 288 survey respondents tagged as being related to predation. Of those comments, themes related to predation include:

Themes	Number of comments
Do not support lethal removal of pinnipeds	90
Support management of pinnipeds (did not indicate support for lethal or non-lethal)	73
Support lethal removal of pinnipeds	72
Concern with interfering with the ecosystem or affecting transient orcas	48
Predation of salmon by pinnipeds is not the primary issue for orcas	40
Support non-lethal measures for pinnipeds such as haul-out removal	12
Support lethal removal of predatory fish	5

The most common predation-related comment received was supported for management of some kind of pinnipeds (46.2% of 340 predation-related comments), although commenters differed on whether they specifically asked for lethal removal (21.2% of predation-related comments), or non-lethal measures (3.5% of predation-related comments).

26.5% of predation-related comments expressed that they did not support lethal removal of pinnipeds at all.

Many people noted their concern for transient orcas and for interfering in the complex ecosystem if lethal management of pinnipeds were to occur (14.1% of predation-related comments).

Forage fish and marine productivity

There were 124 comments tagged as being related to forage fish. Themes include:

Themes	Number of comments
Fund RCO programs	46
Enforce regulations	38
Stop harvest	10

Vessels

There were 491 comments tagged as being related to vessels. The most common themes (with number of entries expressing support and/or opposition) to changes that have occurred since the last public review include:

Themes	Support (number)	Opposed (number)
Greater restrictions on commercial whale watching by number or time of day, etc.	32	~low tens – not tallied systematically
Moratorium or more quiet days or periods	23	12
Restricting kayaks near SRKWs	15	10

In addition, 6 people expressed concerns about safety with shutting off echo sounders (or being thoughtful about alternatives and phase-outs).

Contaminants

There were 173 survey respondents tagged as being related to contaminants. Of those comments, themes related to contaminants include:

Themes	Number of comments
Address stormwater	37
Take immediate action	33
Control PCBs	31
Provide adequate/sustainable funding	23
Need a holistic approach to toxics	21
Follow science not politics or emotion	7

Organization/coalition comments

10/24/2018 to 10/29/2018

Organization	Link to letter
American Whitewater	https://pspwa.box.com/s/9518riu8ll69snbfc8r7aanolufx6im
Animal Welfare Institute	https://pspwa.box.com/s/43jqv2lxqnibsdnjgk6v3axohwcr6m6
Association of Washington Cities	https://pspwa.box.com/s/pkgx85bjkc1tqpv2irsklslx2bmfdsnj
Big Bend Electric Cooperative	https://pspwa.box.com/s/lq2mebl4bvhsxkft4bk4y87fdqlq18zv
Bluefish.org	https://pspwa.box.com/s/1km6vbpdfeflsbmlvw6648dilm23fln0
Bonneville Power Administration	https://pspwa.box.com/s/9ypvc5tpfgyrljhtri21kcvsofryo5pk and https://pspwa.box.com/s/88kwvw007ugzwqz05uvjy71ot88ra8szg
Center for Environmental Law & Policy	https://pspwa.box.com/s/rx7a0jf8yj1dam2y73y7nfmeyj3axb6y
Columbia Rediviva	https://pspwa.box.com/s/os5ey41ihiy12acdocky918ev7kf9wut
Columbia River Inter-Tribal Fish Commission	https://pspwa.box.com/s/masqy3k6nhp3pjt4tzmemiutmmhkvdz1
Defenders of Wildlife	https://pspwa.box.com/s/bbbyw6nb10b8pj2pd3nak2fzcuixib40
Environment Washington	https://pspwa.box.com/s/8ydompwj3q3r7runvhqnuyxmyub156lg
Everett Bayside Marine Inc	https://pspwa.box.com/s/b4gulgzzjoh3djhwee0r6peyb6xbibsy
Fall Creek Fish Company	https://pspwa.box.com/s/tes99kg6nv0oauepc1kd4ym53kqccown
Forterra	https://pspwa.box.com/s/2yzb83adj0jf2mo9rqovkxmj5v8dt8un
Friends of the Earth	https://pspwa.box.com/s/02uft7776x39pgdouy52vhvijdccex3z
Great Old Broads for Wilderness	https://pspwa.box.com/s/usm4j5vylzs3104f21ptfk9funuj61uf
Hood Canal Salmon Enhancement Group	https://pspwa.box.com/s/t1ssnwxwoudch1f1m3cm1wa4cqz9asiw
King County Department of Natural Resources and Parks	https://pspwa.box.com/s/2z2ete5f9x310c174yk3b4helebwyecq
Lands Council	https://pspwa.box.com/s/ifphrbuaqvmvuvbpo6p31mox2xit9gq
Lifeforce Foundation	https://pspwa.box.com/s/tzo9b9f1ms4z9t2o5xhw2msxfih5fvwx
Northwest River Partners (submitted by Lincoln Electric Coop)	https://pspwa.box.com/s/bswxfiyezoics12axr8h3f7oa4w8v8oz
Lummi (re: Roberts Bank)	https://pspwa.box.com/s/iz092d2o45d7kvb7asitu3gn1qjlr9ew and https://pspwa.box.com/s/8i8cxgki22xx3ntviqzitzm3ll2u60u
Native Fish Society	https://pspwa.box.com/s/i2znaziojyha8p0o25edf5l8ytmodm2v
Natural Resources Defense Council	https://pspwa.box.com/s/2465mp0z2erjk4oaahimaiknsw287ul3
NSEA	https://pspwa.box.com/s/0eavxtwx9r4lhpyfj08cd3jngtaaa1j
Olympic Forest Coalition	https://pspwa.box.com/s/k9oea1vz912hda3irh3fc2ceybg28z9m
Orca Behavior Institute	https://pspwa.box.com/s/6eb1fng8ou0ngol95125qdvuwgyxjan9
Orca Salmon Alliance	https://pspwa.box.com/s/qw644hf2j430xql2cymxbsc2ahxnxxq5
Origami Whales Project	https://pspwa.box.com/s/ryoferi57xzpfbrjy5t58rfz0kx6rx5n
Puget Sound Anglers, NOP chapter	https://pspwa.box.com/s/77tvcuhrd4rnlo6xxx9531j8tws1aiyi
Puget Soundkeeper	https://pspwa.box.com/s/uk9gzis2lrmh23t9h86oq4eqm6stpdgl
Puget Soundkeeper Alliance	https://pspwa.box.com/s/ruf1dsc3lg0cd7vd1q9u6p7oy65lho
Regional Fisheries Coalition	https://pspwa.box.com/s/2lq81zltljwf39l4bonsk8jw077aegmk
Salish Sea Foundation	https://pspwa.box.com/s/ybdq7kdhkq2nif9sqjc9bxeqno4mj0w
Salish Sea Institute	https://pspwa.box.com/s/1mcbk3o5r05lairqsihobsbreo0f7hmo
Salmon for All	https://pspwa.box.com/s/vtqwbrqh6qkmtlnl4p41118zbrhj3x90
Save Our Wild Salmon Coalition	https://pspwa.box.com/s/fawewpuunsvq57go0f1seem6kri6u33v
Sierra Club	https://pspwa.box.com/s/o4us7mbtd5qo9vsbaf8s0kzjgebhst2s
Snohomish PUD	https://pspwa.box.com/s/gg51qx29381r7rm8mba5bae9d1rs67ut
Sound Action	https://pspwa.box.com/s/xxtddt4e0tfc5xz2wst625mrf5yxd5
Stand Up to Oil	https://pspwa.box.com/s/o16s2ylc8o91rgd10647ffa9s5ojsvcb
Swinomish Indian Tribal Community	https://pspwa.box.com/s/nzj990948hobhhlx0sieaxvki44mnjkk

Organization	Link to letter
Tacoma Public Utilities/Tacoma Power	https://pspwa.box.com/s/67d9mnngymemigybobjjdb3x5fvwwr6p
U.S. Marine Mammal Commission	https://pspwa.box.com/s/q2vca553uxfjc4oco21qpz1ma2czuq2q
Washington State Association of Counties	https://pspwa.box.com/s/wsonr1r7esvdbtlunievvl0eh9oms3ci
WA Farm Bureau	https://pspwa.box.com/s/wlam0up9a81d200lii7t5mlaigmg3poo
Western Washington University	https://pspwa.box.com/s/cmcc4o47tr4yje4begnya1i5o2tb1ok
Whale and Dolphin Conservation	https://pspwa.box.com/s/5cbpb0pyughe66xq30uas037ydhzbrlc
Whale Scout	https://pspwa.box.com/s/qrhsg0pu4ny2qmvv6ocez1zcaak8h1m2
Whidbey Environmental Action Network	https://pspwa.box.com/s/9bxqftqfyxfjpmhfiaw23hfwv1yxd3l
WRIA-1	https://pspwa.box.com/s/x1cdtobmbv7y4ech8ke8ntrspyqyh0pm

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