2019

Southern Resident Orca Task Force

Final Report and Recommendations

November 2019

CASCADIA
CONSULTING GROUP

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With deep appreciation

Over the past two years, members of the task force and working groups have contributed their expertise, passion and countless hours to the consensus-driven, science-based process that led to these comprehensive recommendations. Task force members and working group participants, along with tribal co-managers, worked together in good faith and with a shared commitment to achieve a thriving and resilient population of Southern Residents and a healthy ecosystem. The task force particularly commends and expresses its deepest appreciation to:

- **Gov. Jay Inslee** for his leadership in initiating this effort, taking immediate executive action to address the needs of the Southern Residents and supporting the task force's recommendations in the Legislature.
- **The Legislature** for authorizing significant investment and statutory changes in the 2019 session to initiate implementation of the task force's recommendations.
- **Tribal partners and co-managers** who have participated in this process, even as they engage government-to-government to resolve the issues facing their people, orcas and salmon. By their words and deeds, tribal representatives consistently reminded us of their cultural and spiritual connections with the orca.
- **Our Canadian counterparts** for coordinating Southern Resident recovery efforts across boundaries. Representatives from Canada and Washington have participated in each other's working group, advisory group and task force meetings, sharing lessons learned through their respective processes and identifying opportunities for transboundary collaboration.
- **The leadership and staff at state and federal government agencies,** including the Governor's Office; Office of Financial Management; Governor's Salmon Recovery Office; Washington State Recreation and Conservation Office; Puget Sound Partnership; Washington State Parks and Recreation Commission; Washington State departments of Fish and Wildlife, Ecology, Natural Resources, Agriculture, Transportation and Licensing; National Oceanic and Atmospheric Administration; Region 10 of the Environmental Protection Agency; and the Marine Mammal Commission, for their unending dedication to the recovery of the Southern Residents and contribution of their time and expertise throughout the process.
- **Members of the public**, for showing up to every meeting no matter the location, for demonstrating how much they care and for constantly reminding us to take bold and aggressive action. Over 18,000 insightful public comments poured in with heartfelt testimony and pleas urging the task force not to let these magnificent creatures go extinct. This call to action has resonated across borders, gaining global media attention and reminding us that the survival of these orcas is imperative to us all — both within and beyond Washington state.

Co-chair letter of transmittal

Governor Jay Inslee
Office of the Governor
Olympia, WA 98504

Dear Gov. Inslee,

We are pleased to submit the following final report and recommendations of the Southern Resident Orca Task Force. It has been our honor and privilege to serve as co-chairs these past two years alongside such a dedicated and diverse team of task force members, working groups and tribal partners who have devoted countless hours to the recovery of Southern Residents.

The following report is a summary of this team's extraordinary work over the past two years — as well as an urgent call to action: **With only 73 individuals remaining, there is no time to waste — the road to sustained Southern Resident recovery is through swift, bold and impactful solutions**. The loss of three adult orcas this year was a tragic reminder that the Southern Residents are struggling from a lack of Chinook salmon, compounded by the stresses from vessel noise and disturbance, contaminants in their ecosystem and the long-term threats to their survival from climate change, ocean acidification and human population growth.

While the challenges threatening the Southern Residents have felt overwhelming at times, we are encouraged that this task force has been a high-profile platform to bring important scientific focus, resources and momentum to the crisis facing the orcas for the first time in years. In 2018, the task force developed 36 bold science-based recommendations for moving the needle on orca recovery and we were heartened to see many elements of these recommendations advance through leadership at the Governor's Office and in the Legislature.

Building on this vital energy and momentum, we continued this work in 2019 by working to implement the task force's 36 recommendations, escalating recommendations that have not advanced enough to achieve their goals, and proposing 13 additional recommendations that we believe are critical for orca recovery. These new recommendations emphasize the importance of (1) effectively addressing climate change, human population growth and human sources of nutrients to enable long-term orca survival, (2) developing dedicated funding to support recovery efforts and (3) continuing the mission of orca recovery.

Together, these 49 recommendations provide multiple benefits that, if sustained, will lead to better water quality, a healthier ecosystem and more robust salmon runs. Ultimately all Washingtonians, our sovereign tribal partners and communities beyond our borders will benefit from less pollution, better fishing and shellfish harvesting, more access to recreation and the opportunity for future generations to enjoy and appreciate the majesty of the orca and the beauty and abundance of the greater Northwest ecosystem.

This task force laid a strong foundation for orca recovery, but this work must find a new home where it will continue to be one of the governor's and the Legislature's top priorities. As the current Southern Resident Orca Task Force sunsets, we remain committed to ensuring this urgent and critical work continues. The Southern Residents need all of us to stay engaged and keep these task force recommendations front and center. We must continue to work with local, state and federal policymakers to demand swift action on funding and policy that will help lead to the orcas recovery.

This task force invites and encourages the entire Washington community to join us in these efforts to achieve our shared vision of a "thriving and resilient population of Southern Resident orcas, living in healthy waters and inspiring our descendants with their majesty." We are immeasurably grateful to the public for their compassion and dedication these past two years and call on them again to stay involved and advocate for institutional change, while making personal commitments to support our orcas and the ecosystems on which they depend.

We are deeply grateful to the team of task force members, working groups and tribal partners for showing up in good faith to recover these orcas through science-based, consensus-driven recommendations. We are especially grateful to our sovereign tribal partners for their crucial leadership and constructive participation in these task force and working group meetings while they also engage government-to-government on salmon and orca recovery efforts. Tribal representatives generously contributed their time and expertise to this process while deepening task force members' knowledge of co-management, treaty-reserved rights and the fundamental need to restore salmon runs for orcas and tribal people.

We've all worked hard to be a voice for the Southern Resident orcas these past two years, but it was the actions of a mother orca named Tahlequah and her valiant swim for 1,000 miles and 17 days with her dead newborn calf that captured the hearts of people around the world. Witnessing Tahlequah's grief galvanized greater public understanding and support for what we must do to save the Southern Residents and the ecosystem they depend upon. People from around the globe called on the task force and elected officials to take bold action to save these magnificent orcas.

We dedicate this final report of the Southern Resident Orca Task Force to Tahlequah, and pledge to work urgently to see its recommendations enacted by our policy makers. We also dedicate this report to the two new orca calves born in 2019 (L124 and J56) and the hope that they bring for the future. Their future depends on all of us in Washington State and British Columbia working together to put the health of the orcas, the salmon and our people first.

Sincerely,

Dr. Les Purce and Stephanie Solien

Executive summary

The power, beauty, intelligence and grace of the Southern Resident orca touch us all. How thrilling for locals and visitors alike to glimpse a pod of Southern Residents frolicking in the waters of the Salish Sea or the Pacific Ocean. How privileged we are to experience an orca sighting whether from land, by boat or even as a ferry passenger! Orcas — especially our Southern Residents — connect us to the beauty and bounty of nature and remind us of the interconnectedness of all living things.

Today, the iconic Southern Resident orca population is in decline and threatened with extinction. Despite federal and state endangered species protections, the population has dropped to only 73 individuals — the lowest level in over four decades. These orcas face several complex threats: lack of Chinook salmon (their primary food source), disturbance from noise and vessel traffic, toxic contaminants, the emerging impacts of climate change and the cumulative effects of continuous population growth across the region.

Year One: Formation of the Southern Resident Orca Task Force and development of recommendations

Recognizing the urgency of the threats facing the Southern Residents and the unacceptable loss extinction would bring, Gov. Jay Inslee established the Southern Resident Orca Task Force through Executive Order 18-02 in March 2018. The governor appointed nearly 50 representatives from diverse sectors to the task force. As sovereign nations, several tribes also chose to send representatives to engage with the task force while engaging government-to-government to resolve the issues facing the orcas and salmon.

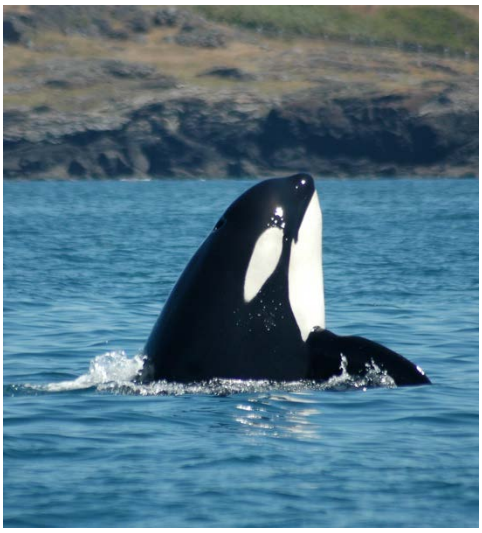
The governor charged this task force with preparing comprehensive recommendations to ensure a healthy and resilient ecosystem that supports a thriving Southern Resident orca population, protected from extinction. From May through November 2018, the task force convened to learn about the threats facing Southern Residents, identify solutions and formulate consensus recommendations. Working groups consisting of subject matter experts, tribal representatives and key stakeholders supported the task force, using the best available science to identify and analyze potential actions.

The task force submitted its Year One Report with a set of 36 bold recommendations for orca recovery to the governor and Legislature in November 2018. These recommendations resulted in significant new investments, policies and regulatory initiatives to help recover Southern Residents and supported four goals: (1) increase Chinook abundance; (2) decrease disturbance of and risk to Southern Resident orcas from vessels and noise and increase their access to prey; (3) reduce the exposure of Southern Resident orcas and their prey to contaminants; and (4) ensure that funding, information and accountability mechanisms are in place to support effective implementation.

Year Two: Assessing progress, addressing emerging issues and looking to the future

Continuing to meet throughout 2019, the task force (1) assessed progress made on implementing Year One recommendations; (2) identified outstanding needs and emerging threats; and (3) formulated new recommendations to address them.

Progress highlights



Thanks to leadership from the governor, Legislature and state agencies, several Year One task force recommendations resulted in significant policies and regulatory initiatives to help recover Southern Residents, representing an encouraging first step in Southern Resident recovery. The enacted 2019–21 biennial budgets (operating, capital and transportation) provided $1.1 billion to support the recovery of Southern Residents and implement the recommendations of the Governor's Southern Resident Orca Task Force. Important and notable successes include:

- **Prey**: Increased hatchery production to increase food for orcas; improved habitat protections; took actions to increase survival through the hydropower system; and decrease predation from pinnipeds and predatory fish. Funding provided for fish barrier corrections; habitat protection, restoration, enforcement and technical assistance;

increased hatchery production; and a process to address issues associated with the possible breaching or removal of the lower Snake River dams.

- **Vessels**: Strengthened distance and speed restrictions near Southern Residents; legislation directing the establishment of commercial whale watching licensing system; established new standards for oil barge tug escorts; broadened education and outreach efforts to promote compliance; and developed voluntary standards to reduce the potential interference of depth finders on Southern Resident echolocation. Funding provided for Washington State Department of Transportation ferry electrification and increased enforcement of vessel regulations.
- **Contaminants**: New state authorities created to prioritize chemicals of concern. Funding provided for water quality enforcement staff and contaminant prevention and cleanup.

Outstanding needs

To address critical gaps and accelerate progress, the task force recommends that the Legislature, governor, agencies and co-managers "double down" on implementing and funding recommendations that address unmet needs and gaps, capitalize on initial progress and ensure that recovery efforts are sustained over time:

- **Prey**: Sustain the priority focus on increasing Chinook abundance through habitat protection and restoration, increased hatchery production while minimizing competition with wild stocks and decreased predation.
- **Vessels**: Advance and fund solutions to vessel disturbances and noise and respond to emerging threats.
- **Contaminants**: Provide resources for implementation, update standards, prioritize actions based on emerging threats to Southern Residents and address nutrient pollution.

Emerging issues and new recommendations

The task force developed 13 new recommendations in Year Two to tackle emergent threats and enable sustained and successful long-term recovery. Five of these new recommendations address the threat of contaminants, including three recommendations that specifically address human sources of nutrients. The task force also focused on two systemic threats to the Southern Residents in Year Two that, if left unchecked, will undermine recovery efforts: (1) climate change and ocean acidification and (2) rapid human population growth and development. The task force established two new goals and formulated seven new recommendations to respond to and mitigate these threats.

Sustainable funding

Accelerating action on the ground, mitigating the threat posed by climate change and managing human population growth to minimize impacts on the orca requires funding at scale, sustained

over the long term. Most of the task force's Year One recommendations also require sustained operating resources for effective implementation, while several others require significant capital investments. Although new funds have been appropriated in many instances, in others they have not, and many that will require consistent funding over multiple biennia.

With great urgency, the task force calls upon elected officials — working with representatives from tribal governments — to engage stakeholders, experts and the public to preserve existing funding and identify and secure new funding sources to meet these needs at the state, local and federal levels. This funding is vital to bringing to scale the work now underway for Southern Resident and Chinook survival and recovery.

Continuing the mission of Southern Resident orca recovery

The Southern Resident Orca Task Force sunsets on Nov. 8, 2019. After this point, it is critically important that the state continues to monitor progress, advocate for the ongoing implementation of the recommendations and adapt to changing conditions by issuing new recommendations as needed. As such, the task force recommends that an oversight committee or similar body be established to continue the vital work of orca recovery and to monitor and advocate for the Southern Residents once the task force disbands. The task force has laid a foundation for Southern Resident recovery; strong, dedicated leadership and governance are necessary to build on this foundation with meaningful, immediate and sustained action.

Southern Resident Orca Task Force
FINAL RECOMMENDATIONS

Bolded recommendations require legislative policy and/or funding:

1. **Significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.**
2. **Immediately fund acquisition and restoration of nearshore habitat to increase the abundance of forage fish for salmon sustenance.**
3. Apply and enforce laws that protect habitat.
4. Immediately strengthen protection of Chinook and forage fish habitat through legislation that amends existing statutes, agency rulemaking and/or agency policy.
5. Develop incentives to encourage voluntary actions to protect habitat.
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.**
7. Prepare an implementation strategy to reestablish salmon runs above existing dams, increasing prey availability for Southern Resident orcas.
8. Increase spill to benefit Chinook for Southern Residents by adjusting total dissolved gas allowances at the Snake and Columbia River dams.
9. Establish a stakeholder process to discuss potential breaching or removal of the lower Snake River Dams for the benefit of Southern Resident orcas.
10. Support full implementation and funding of the 2019–28 Pacific Salmon Treaty.
11. Reduce Chinook bycatch in West Coast commercial fisheries.
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.**

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

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

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

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

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

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.

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.

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

21. Discourage the use of echo sounders and underwater transducers within 1 kilometer of orcas.

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

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.

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

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

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

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.
28. Suspend viewing of Southern Resident orcas.
29. Accelerate the implementation of the ban on polychlorinated biphenyls in state-purchased products and make information available online for other purchasers.
30. **Identify, prioritize and take action on chemicals that impact orcas and their prey.**
31. **Reduce stormwater threats and accelerate clean-up of toxics harmful to orcas.**
32. **Improve effectiveness, implementation and enforcement of National Pollutant Discharge Elimination System permits to address direct threats to Southern Resident orcas and their prey.**
33. Increase monitoring of toxic substances in marine waters; create and deploy adaptive management strategies to reduce threats to orcas and their prey.
34. **Provide sustainable funding for implementation of all recommendations.**
35. **Conduct research, science and monitoring to inform decision-making, adaptive management and implementation of actions to recover Southern Residents.**
36. Monitor progress of implementation and identify needed enhancements.
37. Protect against regulatory rollbacks at the federal and state level.
38. **Explore setting minimum standards for local stormwater funding to ensure that all programs have the resources necessary to protect water quality.**
39. **Develop a National Pollutant Discharge Elimination System permit framework for advanced wastewater treatment in Puget Sound to reduce nutrients in wastewater discharges to Puget Sound by 2022.**
40. Better align existing nonpoint programs with nutrient reduction activities and explore new ways to achieve the necessary nonpoint source nutrient reductions.
41. **Collect high-quality nutrient data in watersheds to fill key knowledge gaps of baseline conditions.**

42. Create one or more entities with authority and funding to recover and advocate for Southern Resident orcas by implementing task force recommendations, creating new recommendations as needed and reporting to the public, governor and tribal co-managers on status.

43. Take aggressive, comprehensive and sustained action to reduce human-caused greenhouse gas emissions, with the goal of achieving net zero emissions by 2050.

44. Increase Washington's ability to understand, reduce, remediate, and adapt to the consequences of ocean acidification.

45. Mitigate the impact of a changing climate by accelerating and increasing action to increase the resiliency and vitality of salmon populations and the ecosystems on which they depend.

46. Expand the Governor's Maritime Blue scope of work and provide funding to implement recommendations from the Southern Resident Orca Task Force and pursue shipping and other maritime innovations that benefit Southern Residents.

47. Identify and mitigate increased threats to Southern Residents from contaminants due to climate change and ocean acidification. Prioritize actions that proactively reduce exposure where the increased impacts are expected to be most severe.

48. Adopt and implement policies, incentives and regulations for future growth and development to prevent any further degradation of critical habitat and sensitive ecosystems; enable and channel population growth in ways that result in net ecological gain; evaluate and report outcomes for all jurisdictions at the state, county, tribal and municipal level.

49. Conduct a comprehensive environmental review and take action to minimize potential whale-strike risk and underwater noise posed by the growing number and distribution of fast-ferries and water taxis in Southern Resident critical habitat.

Chapter 1. Task force – purpose, process and outcomes

Introduction

Southern Resident orcas hold significant value throughout the Pacific Northwest as a treasured and iconic species. Many sovereign tribal nations consider these orcas ancestors, protectors of humankind and family members. The Lummi people call the orcas qwe ‘lhol mechen, which means “our relations under the waves.” As Leonard Forsman, chairman of the Suquamish Tribe, put it, “The Southern Resident killer whales are like us: They depend on these waters for their survival, for their well-being, for food and recreation, for their spirituality as well [1].”

These whales are highly intelligent and complex beings, evolving to become the top predators in their ecosystems. Their lives show many similarities to ours — including their incredibly close social bonds. Southern Residents travel in pods (J, K and L) of extended family members 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 mouth of the Columbia River in winter [2].[1]

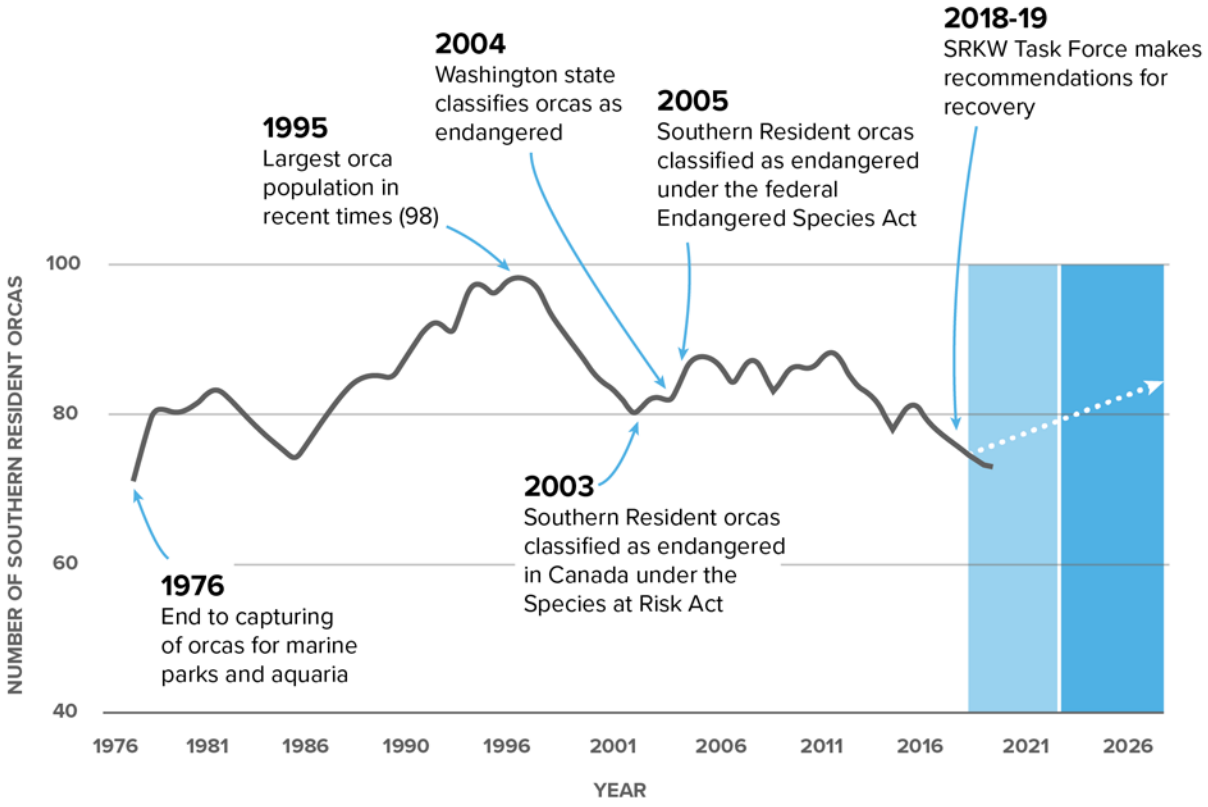
The first Southern Resident orca population census in 1973 identified 66 orcas. It included reductions due to captures for marine parks between 1965 and 1975. Since 1975, the population has experienced periods of growth, and in 1995 reached a high of 98 orcas (**Figure 1**). However, between 1995 and 2003, the population dropped by 16%, down to 82 orcas, which prompted

[1] NOAA has issued a proposal to expand the Southern Resident orca critical habitat designation to include the coastal waters of Washington, Oregon and California (to Point Sur). The expansion would provide additional habitat protection in acknowledgment that the full extent of the orcas’ range is critical for their survival and recovery [78].

their listing as an endangered species [3]. Canada classified Southern Resident orcas as endangered under the Species at Risk Act in 2003. Washington state classified them as endangered in 2004, and the United States followed suit under the federal Endangered Species Act in 2005. The 2005 ESA listing identified three major threats to Southern Resident orcas: lack of prey, disturbance from noise and vessel traffic and toxic contaminants.

Despite federal and state protections, Southern Resident population numbers have continued to fall — reaching the lowest level in more than four decades. Swift and bold near-term actions and effective long-term actions are urgently needed to help secure a healthy and sustained Southern Resident orca population and the entire ecosystem we depend upon.

Figure 1. Southern Resident orca population trends and recovery goals [4].



From 2018-22
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).

Formation of the Southern Resident Orca Task Force

Recognizing the urgency of the threats facing the Southern Residents and the unacceptable loss extinction would bring, Gov. Inslee established the Southern Resident Orca Task Force through Executive Order 18-02. The governor directed this newly formed task force to meet over two years to (1) recommend priority actions, legislation and funding in Year One and (2) monitor progress, identify lessons learned and address outstanding needs in Year Two.

The governor appointed nearly 50 representatives from diverse sectors to the task force, including federal, local and other state governments, the Washington State Legislature, state agencies, the private sector, nonprofit organizations and the Government of Canada. As sovereign nations, several tribes also chose to send representatives to engage with the task force, sharing their perspectives and knowledge about orcas, salmon recovery and treaty rights.

Year One: A road map to recovery through bold actions

From May through November 2018, the task force convened to learn about the threats facing Southern Residents, identify solutions and formulate consensus recommendations. The task force developed the following vision to guide their work:

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

The task force aligned with the National Marine Fisheries Service 2008 Recovery Plan, and its goal of an average population growth rate of 2.3% per year for 28 years. The task force set out to increase the Southern Resident population to 84 whales by 2028 — 10 more whales in 10 years. The task force also defined near-term criteria for recovery that include evidence of (1) consistently well-nourished whales; (2) more live births; and (3) the survival of several thriving young orcas.

Responding to this call to action, prey, vessels and contaminants working groups — consisting of subject matter experts, tribal comanagers and key stakeholders — supported the task force in their goals and commitments, using the best available science to identify and analyze potential recommendations. A steering committee also supported the task force, charged with ensuring and enabling a smooth and effective process that meets the goals and timeliness of the governor's executive order. Refer to **Appendix 3** for a full list of task force, working group and steering committee members.

Throughout 2018, tragedies in the Southern Resident population continued to put a spotlight on the need for urgent and effective action. Tahlequah (J35) carried her deceased newborn calf for 17 days in late July and early August for more than 1,000 miles in an apparent act of grief and mourning. Three-year-old Scarlet (J50) was presumed dead in September after showing signs of

severe emaciation. Eighteen thousand public comments poured in during the task force's first year, with heartfelt testimony and pleas to not let these magnificent creatures go extinct.

The task force submitted its Year One Report with a set of 36 bold recommendations for orca recovery to the governor and Legislature in November 2018. These recommendations have resulted in significant new investments, policies and regulatory initiatives to help recover Southern Residents.

Year Two: Monitoring progress, addressing emerging issues and navigating the road ahead

Despite this progress, the status of the Southern Resident population remains critical. In 2019, the task force celebrated the birth of two new orca calves (L124 and J56), while mourning the loss of three adult orcas in the same year (J17, K25 and L84). These tragic losses have resulted in the fewest number of Southern Residents in over 40 years — just 73 individuals (**Figure 1**). While observations in summer of 2019 indicate that many orcas appear to be in improved body condition, the entire population has not been assessed, and underlying health issues may be unknown.

Although Southern Residents have historically frequented the Salish Sea in summer months, they were present in their accustomed summer foraging area for only two days in June and July 2019. This extended absence is an unprecedented seasonal shift in use of their historic core and critical habitat. While the cause is unclear, continued or worsening pressure from known threats such as lack of prey and vessel noise and disturbance likely led or contributed to their displacement. For example, several Chinook stocks, such as from the Fraser River, saw extremely low numbers of returning Chinook. The successful recovery of Southern Resident orcas and their prey will continue to hinge on coordinated U.S. West Coast and transboundary monitoring and management actions, especially as species alter their geographical distributions due to climate change [5].

With a declining population, a continued lack of prey and ever-increasing adverse impacts from vessels, noise and toxics, Southern Resident orcas are still in crisis. Picking up where they left off in Year One, the task force continued to meet throughout 2019, supported by the working groups and steering committee. The task force focused their Year Two efforts on (1) assessing progress made on Year One recommendations; (2) identifying outstanding needs and emerging threats; and (3) formulating new recommendations to address them.

The following chapters of this report present the outcome of these deliberations:

- **Chapter 2**: Assessment of Year One recommendations
- **Chapter 3**: Emerging issues addressed in Year Two
- **Chapter 4**: Continuing the mission of Southern Resident orca recovery

Chapter 2. Assessment of Year One recommendations — progress made and outstanding needs

Introduction

In its first year, the task force focused on developing a bold package of 36 recommendations. If implemented, these recommendations would collectively have the impact needed to achieve the vision of a thriving and resilient Southern Resident orca population and support four goals:

- **Goal 1:** Increase Chinook abundance [**16 recommendations**].
- **Goal 2:** Decrease disturbance of and risk to Southern Resident orcas from vessels and noise and increase their access to prey [**12 recommendations**].
- **Goal 3:** Reduce the exposure of Southern Resident orcas and their prey to contaminants [**5 recommendations**].
- **Goal 4:** Ensure that funding, information and accountability mechanisms are in place to support effective implementation [**3 recommendations**].

In its second year, the task force focused on implementing and monitoring these recommendations. Working groups met throughout summer 2019 to evaluate progress and the task force reviewed the outputs of these deliberations, highlighting the notable accomplishments to date, as outlined in this chapter.

While several Year One recommendations made noteworthy progress, some recommendations have not advanced enough to achieve their respective goals. As a result, the task force proposes urgent actions and/or additional funding to advance these recommendations as outlined in this chapter.[2] Refer to the following sections of this chapter for the task force's assessment of progress, outstanding needs, and lessons learned for Year One task force recommendations. Refer to **Table 1** for a legend of the progress indicator icons used in this chapter.

Table 1. Progress indicator icon legend.

	All pieces of recommendation are moving forward (or have been completed).
	Some pieces of recommendation are moving forward.
	Recommendation is not on track to achieve respective goal.

Goal 1: Increase Chinook abundance

While other populations of killer whales prey upon a variety of marine mammal or shark species, Southern Residents have uniquely evolved to prey upon salmon — with Chinook making up about 80% of their diet [6]. Many Chinook populations across the Pacific Northwest have declined to a fraction of their historic abundance and are listed as either threatened or endangered under the Endangered Species Act. In addition, Chinook are returning younger and smaller than they have historically. These significant shifts in abundance and size are making Chinook less available and less nutritious for Southern Resident orcas.

To put Southern Resident orcas on the path to recovery:

- **They need healthy ecosystems and food sources in Washington and throughout the west coast of the United States and Canada**. Southern Residents make their home in Washington's marine waters for a large portion of the year, but they are also migratory, seeking Chinook along the West Coast from Northern California to Southeast Alaska.
- **Chinook populations in these regions need to be abundant, diverse and accessible**, which requires productive and protected habitat and a reliable forage fish food source for Chinook and other salmon. Multiple factors combine to affect salmon abundance and productivity, including habitat loss and degradation, fish passage, harvest, hydropower survival, hatcheries, predation and forage fish and food web interactions.

In Year One, the task force developed 16 recommendations for increasing Chinook abundance, presented below with respective progress indicators as of November 2019. Refer to **Appendix 2** for detailed dashboard of Year One recommendations and progress made on each.

[2] **Urgent actions** emphasize one or more components of a Year One recommendation that has not advanced enough to achieve its goal. **Additional components** fill a gap in a Year One recommendation.

Table 2. Year One prey recommendations - progress as of November 2019.

Progress		Recommendation
+	1	Significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.
+	2	Immediately fund acquisition and restoration of nearshore habitat to increase the abundance of forage fish for salmon sustenance.
+	3	Apply and enforce laws that protect habitat.
+	4	Immediately strengthen protection of Chinook and forage fish habitat through legislation that amends existing statutes, agency rule making and/or agency policy.
+	5	Develop incentives to encourage voluntary actions to protect habitat.
+	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.
✓	7	Prepare an implementation strategy to reestablish salmon runs above existing dams, increasing prey availability for Southern Resident orcas.
✓	8	Increase spill to benefit Chinook for Southern Residents by adjusting total dissolved gas allowances at the Snake and Columbia River dams.
✓	9	Establish a stakeholder process to discuss potential breaching or removal of the lower Snake River Dams for the benefit of Southern Resident orcas.
✓	10	Support full implementation and funding of the 2019–28 Pacific Salmon Treaty.
+	11	Reduce Chinook bycatch in west coast commercial fisheries.
−	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.
+	13	Support authorization and other actions to more effectively manage pinniped predation of salmon in the Columbia River.
+	14	Reduce populations of nonnative predatory fish species that prey upon or compete with Chinook.
✓	15	Monitor forage fish populations to inform decisions on harvest and management actions that provide for sufficient feedstocks to support increased abundance of Chinook.
+	16	Support the Puget Sound zooplankton sampling program as a Chinook and forage fish management tool.

Progress highlights:

Increased hatchery production to increase food for orcas.

Washington state, tribes and public utility districts received $13.54 million from the Legislature (operating budget) to increase hatchery production consistent with sustainable fisheries and stock management, available habitat, recovery plans and the Endangered Species Act. Increases in production will occur in state, tribal and public utility district facilities, resulting in 26.84 million additional smolts annually. The Legislature also provided nearly $40 million (a 20% increase) to make capital improvements to state hatcheries (**Recommendation 6**).

Improved habitat protections, restoration, enforcement and technical assistance.

The state passed governor-requested House Bill 1579 in 2019, addressing habitat protection of shorelines and waterways, specifically increasing Washington Department of Fish and Wildlife civil enforcement authority for hydraulic project approvals and removing key exemptions (Chapter 290, Laws of 2019 (2SHB 1579)) (**Recommendations 3 and 4**).

$10.3 million was included in the operating budget and $447.8 million in the capital budget for salmon habitat restoration programs. This funding represents a 22.1% increase in capital funding from the previous biennium (**Recommendations 1 and 5**).

$4.5 million was provided to increase technical assistance and enforcement of state water quality, water quantity and habitat protection laws. This funding will result in four additional WDFW enforcement officers to enforce hydraulic project approval permits. The Washington State Department of Ecology will hire three additional nonpoint source water quality specialists, three additional water quality inspectors focusing on point source pollution and five additional water masters in Puget Sound to enforce instream flow rules (**Recommendation 3**).

Increased survival through the hydropower system.

On March 29, 2019, Ecology issued a short-term modification for total dissolved gas criteria for areas on the lower Snake and lower Columbia rivers so that the allowable 120% total dissolved gas aligned with Oregon. In May 2019, Ecology initiated a rulemaking process to update Washington's total dissolved gas criteria for these rivers, allowing spill up to 125% total dissolved gas. If adopted, the rule would allow the U.S. Environmental Protection Agency the regulatory time frame to approve revised total dissolved gas water quality criteria by the 2020 spring spill season (**Recommendation 8**).

Decreased predatory fish impacts.

The state passed legislation in 2019 to decrease impacts of predatory fish on salmon, directing WDFW to develop rules to increase bag limits for certain species that overlap with and prey on salmon (Chapter 290, Laws of 2019 (2SHB 1579)) (**Recommendation 14**).

Decreased pinniped predation on the Columbia River.

Congress passed the federal Endangered Salmon Predation Prevention Act (PL 115-329), giving state and tribal resource managers more flexibility to manage sea lion predation in the Columbia River to minimize impacts to salmon. The law allows the National Oceanic and Atmospheric Administration's National Marine Fisheries Service to approve permits for Washington, Oregon, Idaho and several area tribes that will streamline the removal process of a designated number of sea lions from a portion of the Columbia River and adjacent tributaries each year (**Recommendation 13**).

Washington State Department of Transportation fish passage.

$275 million was provided to WSDOT to complete fish barrier corrections necessary to meet the requirements of the U.S. federal court culvert injunction. This funding is a $176 million, or 177%, increase from the previous biennium (**Recommendation 1**).

Lower Snake River dams stakeholder process.

$750,000 was approved to implement a stakeholder engagement process to determine the economic, social and environmental impacts of the potential breaching or removal of the lower Snake River dams (**Recommendation 9**).

Outstanding needs:

Fully fund salmon recovery plans.

Increase funding and partnerships to fully implement priority habitat actions in salmon recovery plans, working with legislators, stakeholders and tribes. Focus on implementing habitat restoration and protection projects that local experts have prioritized in each salmon recovery region and that will benefit Chinook and Southern Residents. Ensure funding includes administration and local capacity-building to accelerate projects that are underway or have committed resources. Ensure greater collaboration between hatchery and habitat restoration efforts so that habitat is available to recover wild fish and for newly produced hatchery fish (**urgent action for Recommendations 1, 2 and 6, requires legislative funding**).

A recent estimate of the costs and potential funding gaps to implement regional salmon recovery plans is currently unavailable. The latest, most comprehensive estimate of the statewide cost of implementing the habitat-related elements of regional salmon recovery plans was completed in 2011:

- That report estimated the cost to implement regional salmon recovery plans for all species for the period of 2010–19 to be $5.5 billion, with $4.7 billion in capital costs and nearly $800 million in non-capital costs [7].
- This funding translates to $550 million in annual costs. The report found that if current state, federal and local sources were maintained for the coming 10 years, they would

support approximately 25% of the actions recommended in regional recovery plans statewide.

- This estimate does not include the costs of non-habitat-related actions (hydropower, hatcheries, harvest, predation and invasive species) needed to recover salmon.
- This estimate is likely to be somewhat higher than what would be needed solely for orca recovery since it includes costs for salmon species that are not a primary food source for Southern Residents.
- City and county governments are critical salmon recovery partners. These estimates to implement the salmon recovery plans do not fully encompass the costs to local governments for restoration activities and land use protection and regulatory programs. Additional work is required to generate these estimates, and to provide the necessary support and funding to local governments for salmon recovery plan implementation.

Although some overlap with fish passage barrier projects in the Regional Salmon Recovery plans exists, a significant funding gap for the correction of state and local fish passage barriers remains:

- Under a federal injunction, WSDOT has 992 remaining fish passage barriers on state highways to correct in Puget Sound and along the Washington coast north of the Willapa and Columbia River drainages.
- Four hundred and fifteen of these barriers with significant habitat blockages need to be corrected by 2030 to meet the injunction's requirements.
- WSDOT's current estimate to comply with the injunction by 2030 is an additional $3.1 billion and would be expected to increase if implementation is delayed [8].

In addition to state fish passage barriers, local governments also have barriers blocking fish passage:

- Approximately 3,200 county culverts are within the injunction case area and will cost an estimated $7.7 billion to correct [9, 10].
- The Association of Washington Cities has estimated a potential cost of $4.2 billion to correct its 1,233 known city barriers [11].
- So far, no long-term funding source has been identified to fix the fish blockages in local government jurisdictions.

Assuming that state funding of $225 million annually in the 2019–21 biennium capital budget continues, current funding sources would be providing approximately 50% of the annual need for salmon habitat restoration.

- This estimate is not adjusted for inflation and does not reflect projects which have been funded or new projects that may have been developed since 2011.

- The Puget Sound Partnership's 2018–22 Action Agenda for Puget Sound Recovery, completed in December 2018, estimates a total cost of implementation of a little more than $1.3 billion.
- To date, secured funding of $254 million amounts to only 19% of projected costs [12].

Focusing only on Chinook recovery in Puget Sound yields a similar result:

- The 2018–22 Action Agenda estimates a cost of $729 million to implement the Chinook Salmon Priority focus area over those four years.
- The $135 million in secured funding to date represents only 18.5% of the funding necessary to implement the near-term actions related to Chinook recovery [13].

These estimates for Chinook recovery and overall Puget Sound recovery do not reflect the actual increase in funding in the 2019–21 biennial budget, so they are likely overestimating the funding gap.

Increase habitat protection.

Reduce the impacts from development on critical habitat and sensitive ecosystems that Southern Residents and the food web rely upon. Revise statutes to shift from a "no net loss" standard to a "net ecological gain" standard to better protect salmon and orcas. Provide adequate funding and support to state natural resource agencies and local governments to improve planning, permitting and enforcement activities that protect habitat, while funding restoration efforts (**additional component of Recommendations 3 and 4 and NEW Recommendation 48**).

Investigate and address pinniped predation.

Provide funding to WDFW to (1) determine if pinniped predation is a limiting factor for Chinook in Puget Sound and along Washington's outer coast and (2) more effectively manage pinniped predation in the Columbia River (**urgent action for Recommendations 12 and 13, requires legislative funding**).

Increase early marine survival research and monitoring in Puget Sound.

Increase funding to PSP and WDFW for salmon marine survival research and monitoring projects through the Puget Sound Action Agenda to ensure that results may be integrated in recovery and management plans, as appropriate. Research and monitoring projects could include Puget Sound Atlantis Modeling, zooplankton monitoring, salmon and forage fish sampling and pinniped predation work (**urgent action for Recommendations 12, 15, 16, requires legislative funding**).

Prevent northern pike expansion into the Columbia River.

Increase funding to WDFW for northern pike eradication and containment efforts to prevent predation on salmon in the Columbia River (**additional component of Recommendation 14, requires legislative funding**).

Improve water quality.

Encourage Ecology to proceed with language in new rules on increasing the standard for total dissolved gas allowances in the Columbia and Snake rivers that will ensure the durability of the new rule (**urgent action for Recommendation 8**).

Lessons learned:

Reduced age and size of Chinook at return.

The reduced age and size of Chinook at return increases concern about prey quality and quantity available to Southern Residents. Additional investigation and adaptive management are needed to better understand and address the underlying reasons for these changes in prey. Tracking progress and effectiveness of task force recommendation implementation around prey is critical to maintaining recovery momentum and achieving recovery goals.

Efforts to reduce Chinook bycatch.

In recent years, substantial progress has been made by the Pacific Fishery Management Council and North Pacific Fishery Management Council to reduce the bycatch of Chinook in federal groundfish fisheries in the Bering Sea, the Gulf of Alaska and off the coasts of Washington, Oregon and California.

For example, 2018 Chinook bycatch levels in the Bering Sea and Gulf of Alaska were 34,288 (NPFMC), well below the upper limit of about 109,000. Bycatch in the West Coast groundfish fisheries was 7,492 Chinook (West Coast Groundfish Observer Program) in 2018, which is also considerably lower than the limit of 20,000.

Task force Recommendation 11 requested that WDFW continue to work with regional councils and stakeholders to further reduce bycatch in West Coast fisheries. While changes to timing, gear and harvest areas have contributed to the bycatch reductions to date, WDFW will need to continue to work within the councils to seek further reductions when and where possible as new technology and research become available.

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

Southern Residents travel in pods from central southeast Alaska to central California, spending most of the year in the Salish Sea near the San Juan Island, along the outer coasts of Washington and southern Vancouver Island. Vessels transiting near Southern Resident orcas can disturb and displace them from their preferred areas. Underwater noise can mask or impair orca communication and echolocation (the method orcas use to find their prey). Even virtually silent vessels (e.g., kayaks) can disturb the orcas and reduce the time they devote to foraging by 15-20%, which decreases their potential prey intake while increasing their energy expenditure [14]. 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 [15]. Key sources of concern include ships, small vessels, echo sounders and oil spills.

In Year One, the task force developed 12 recommendations for decreasing disturbance of — and risk to — Southern Resident orcas from vessels and noise, presented below with respective progress indicators as of November 2019. Refer to **Appendix 2** for a detailed dashboard of Year One recommendations and progress made on each.

Table 3. Year One vessels recommendations - progress as of November 2019.

Progress	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.
✓	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.
+	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.
✓	20	Increase enforcement capacity and fully enforce regulations on small vessels to provide protection to Southern Residents.
+	21	Discourage the use of echo sounders and underwater transducers within one kilometer of orcas.
+	22	Implement shipping noise-reduction initiatives and monitoring programs, coordinating with Canadian and U.S. authorities.
✓	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.
+	24	Reduce the threat of oil spills in Puget Sound to the survival of Southern Residents.
+	25	Coordinate with the Navy in 2019 to discuss reduction of noise and disturbance affecting Southern Resident orcas from military exercises and Navy aircraft.
✓	26	Revise chapter 77.15.740 RCW to increase the buffer to 400 yards behind the orcas.
+	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.
−	28	Suspend viewing of Southern Resident orcas.

Progress highlights:

Rapid implementation of state legislation passed in 2019.

- All vessels must now stay 300 yards away on either side and 400 yards in front of and behind Southern Resident orcas and must slow down to seven knots within half nautical mile of Southern Resident orcas (Chapter 291, Laws of 2019 (2SSB 5577)) (**Recommendations 17, 26, 28**).

- WDFW will establish a licensing system for commercial whale watching operations (Chapter 291, Laws of 2019 (2SSB 5577)) (**Recommendation 18**).
- Washington will establish new standards for tug escorts for oil barges in Rosario Strait to improve protection from oil spills (Chapter 289, Laws of 2019 (SHB 1578)) (**Recommendation 24**).
- The state broadened outreach efforts to educate boaters and promote compliance through Be Whale Wise (Chapter 293, Laws of 2019 (SB 5918)) (**Recommendation 19**).
- $1.36 million was provided to WDFW to implement new legislation and will result in increased officer presence/number of patrols (Chapter 291, Laws of 2019 (2SSB 5577)) (**Recommendation 17**).

New voluntary guidelines limiting boaters' use of echo sounders near orcas.

In both Puget Sound and Canadian waters, maritime groups established safe, voluntary standards to reduce the potential interference of depth finders with Southern Residents' echolocation (**Recommendation 21**).

Electrification of ferries.

$140 million was included in the transportation budget to acquire one new hybrid electric ferry and to convert up to two existing ferries to hybrid electric (**Recommendation 23**).

Outstanding needs:

Increase funding for education and enforcement.

Increase funding and make funding ongoing to WDFW for additional officers and equipment for enforcement of vessel regulations (**urgent action for Recommendation 20, requires legislative funding**).

Provide resources to WDFW and other groups to (1) expand boater education and enforcement to central Puget Sound in the fall, (2) seek vessel mitigation opportunities and (3) extend outreach to promote compliance by vessel operators in newly proposed critical habitat on the outer coast of Washington (**additional component of Recommendation 19, requires legislative funding**).

Create a transboundary forum.

Create and charter a transboundary forum for waterways management and Southern Resident conservation by working with the appropriate federal partners, tribes and agencies to integrate and coordinate state, federal and Canadian actions. Evaluate cumulative impacts of vessel traffic (**additional component of Recommendations 22, 24 and 27**).

Actively promote compliance with Canada's foraging sanctuary zones.

Actively promote compliance by the United States shipping sector and recreational vessels with Canada's interim and potential future foraging sanctuary zones such as Swiftsure Bank and Pender Island (**additional component of Recommendation 22**).

Ensure the State Environmental Policy Act review of marine facilities.

Help ensure that the State Environmental Policy Act review of marine facilities is routinely applied to standard and atypical changes in use and ownership that may lead to increased vessel traffic or changes in vessel traffic dynamics. Provide tools for local and state governments to identify and evaluate potential impacts and recommend potentially appropriate mitigation measures (**additional component of Recommendation 27**).

Reduce noise and disturbance from U.S. Navy military exercises.

The Navy has proposed new and continued training and testing activities off the coast of Washington, Oregon and California, as described in the 2019 Northwest Training and Testing Draft Supplemental Environmental Impact Statement/Overseas Environmental Impact Statement. New activities include testing with explosives and the use of new technologies such as high-energy lasers, kinetic energy weapons and biodegradable polymers. The Navy will be consulting with the NOAA NMFS on its activities to address potential impacts that may affect Southern Resident Killer Whales.

In 2019, the draft supplemental environmental impact statement for these activities revealed several significant concerns. Gov. Inslee, Seattle Mayor Jenny Durkan, WDFW, PSP and many other organizations submitted formal comments to the Navy to express concerns and recommend measures to mitigate potential impacts related to sound, emerging technologies and spatial and temporal overlaps between Navy activities and orca populations. Specific concerns include:

- Navy testing is already altering the soundscape in areas where orcas are present. These new activities are highly likely to increase noise and related disturbances that adversely affect the Southern Residents, with the potential to cause direct mortality, displacement from preferred habitats and interference with critical behaviors including breeding, nursing, foraging and socializing [16, 17].
- The draft supplemental environmental impact statement does not appear to take into account research by NOAA describing the overlap between the Navy's current and planned activities and places where orcas are present (e.g., offshore of Cape Flattery), as indicated by NOAA's offshore hydrophone network [16].
- Underwater explosive detonations are projected to continue. Detonations can cause ruptured or hemorrhaged organs in marine mammals that can be fatal [17].
- New sonar testing is proposed both pier-side and at sea. Surface ship sonar maintenance is proposed to increase by over 90%. Sonar can cause temporary hearing loss, behavioral reactions, masking of sounds and stress in orcas [17].

- The Navy's new activities will incorporate new technologies with unknown effects, such as high-energy lasers, kinetic energy weapons and biodegradable polymers. They will also increase the use of unmanned systems, which raises concerns about underwater noise, sonar use, radio transmissions and use of lasers. Although the Navy proposes to use surface-level lookout systems for whales, these lookouts are inadequate because (1) the visual range of human lookouts is limited and (2) historically one-quarter of Navy tests have occurred at night, further limiting visibility [16].
- The proposed Navy activities do not account for the Southern Residents' seasonal behaviors; by assessing the orcas' seasonal movements — and adjusting planned Naval activities accordingly — the Navy can reduce negative impacts to Southern Resident orcas and other species [16].
- NOAA recently proposed expansion of designated critical habitat for Southern Resident orcas to include coastal areas from Washington to central California. It is unclear to what extent the Navy's proposed training and testing activities in the northern offshore area of Washington would be confined to the area known as the "Quinault Range." Public comments on the proposed rule are open through December 18, 2019.

While the federal regulatory process for the draft supplemental environmental impact statement is underway, the Navy has proactively participated in the vessels working group. The Navy is exploring the opportunity to follow the precedent set by Washington State Ferries to be an early adopter of the Whale Report Alert System from Canada, as mariners and experienced observers in Puget Sound try to extend the tool's effective range southward [16]. WRAS would provide the Navy with an additional source of nearly real-time information on the location of Southern Residents before conducting operations that might affect the whales.

The Governor's Office and state agencies should coordinate with NOAA and the Navy to reduce noise and disturbance affecting Southern Resident orcas from military exercises. In particular, the final decisions on training and testing activities conducted in the Northwest training and testing study area between November 2020 and November 2027 should eliminate impacts from current, new or additional exercises involving mid-frequency sonar, explosives and other activities with the potential to adversely affect Southern Resident orca recovery or incorporate enhanced mitigation measures to reduce impacts (**urgent action on Recommendation 25**).

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

Southern Residents are exposed to pollutants primarily through their prey and also through transfers from their mothers. Their prey (salmon) are exposed to pollutants in their freshwater and marine habitats throughout their lives. Many 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 available for the orcas. Toxic contaminants can also reduce immunity and cause reproductive disruption in orcas.

In Year One, the task force developed five recommendations for reducing the exposure of Southern Resident orcas and their prey to contaminants, presented below with respective progress indicators as of November 2019. Refer to **Appendix 2** for a detailed dashboard of Year One recommendations and progress made on each.

Table 4. Year One contaminants recommendations - progress as of November 2019.

Progress	Recommendation	
	29	Accelerate the implementation of the ban on polychlorinated biphenyls in state-purchased products and make information available online for other purchasers.
	30	Identify, prioritize and take action on chemicals that impact orcas and their prey.
	31	Reduce stormwater threats and accelerate clean-up of toxics that are harmful to orcas.
	32	Improve effectiveness, implementation and enforcement of National Pollutant Discharge Elimination System permits to address direct threats to Southern Resident orcas and their prey.
	33	Increase monitoring of toxic substances in marine waters; create and deploy adaptive management strategies to reduce threats to orcas and their prey.

Progress highlights:

New state authorities created to prioritize chemicals.

Includes new authority for Ecology to prioritize chemicals for species, develop chemical action plans and ban chemicals in products. $4.7 million and $3.7 million were included in the operating and capital budgets, respectively, to prevent toxics from entering the environment (**Recommendation 30**).

Contaminant cleanup.

$4.8 million was provided in the operating budget and $136.6 million in the capital budget to clean up toxics sites and contaminants. This funding represents a 27.3% increase in capital funding from the previous biennium (**Recommendation 31**).

Additional water quality enforcement capacity.

The Legislature provided funding for water quality enforcement staff at Ecology. Newly issued municipal stormwater permits now require smaller jurisdictions to implement local source control (**Recommendation 32**).

Outstanding needs:

Maintain Model Toxics Control Act funding.

Toxics control funding provided though the state's MTCA should be maintained for preventing and cleaning up toxics (**additional component of Recommendation 31**).

Fund source local control program and increase incentives to reduce stormwater threats.

Additional funding should be provided for Ecology staff to support contaminants recommendations and pass-through funding to support local source control inspectors (**urgent action on Recommendations 30, 31 and 32, requires legislative funding**).

Funding should also be provided for incentives to reduce stormwater threats (**urgent action on Recommendation 31, requires legislative funding**).

Increase funding for infrastructure improvements.

Increase funding to specific accounts that support infrastructure improvements, including the Clean Water Pollution State Revolving Fund, Stormwater Financial Assistance Program and Public Works Trust Fund. Increase caps on utility fees to help fund improved treatment of wastewater, stormwater and other contaminant sources (**additional component of Recommendation 31, requires legislative funding**).

Prioritize stormwater cleanup based on salmon population productivity.

It is critical that we find ways to prioritize discretionary stormwater management and cleanup based on evidence of toxic impacts limiting salmon population productivity. Current state-level stormwater funding could be better targeted to priority areas. Programs currently do not seek highest-priority projects (**urgent action on Recommendation 31**).

Prioritize contaminants of emerging concern and update aquatic life water quality standards.

The state should support ongoing prioritization work that addresses contaminants of emerging concern. Ecology should update aquatic life water quality standards focused on pollutants most harmful to Southern Resident orcas and their prey (**urgent action on Recommendations 30 and 32, requires legislative funding**).

Increase monitoring and associated funding.

Weave monitoring into each recommendation and dedicate funding to Ecology, PSP and WDFW to provide data on effectiveness (**additional component of Recommendation 33**).

Lessons learned:

Stormwater management on state highways.

Roadways accumulate toxics; when not adequately managed, the runoff that contains those toxics can be lethal to salmonids. As methods are available to reduce the impact of road runoff, the contaminants working group recognized the importance of accelerating work on public highways to address them as a source of toxic contaminants. Finding ways to do more, faster is an important long-term need for recovering Southern Resident orcas and their prey.

The WSDOT should work with Ecology to explore opportunities to increase the pace of stormwater retrofits and ways to provide increased stormwater treatment on state highways. As state highways only constitute a small portion of the statewide road system, any state-level effort should serve as a model for addressing roads maintained by local jurisdictions (**Recommendation 31**).

Holding producers of toxics accountable.

Shifting the cost burden to producers of toxic contaminants is critical to supporting their long-term reduction. It is important to find ways to ensure that the costs of remediating contaminants are borne by those responsible for introducing them in the first place. The task force supports the Attorney General's Office efforts to pursue the polychlorinated biphenyl (more commonly referred to as "PCB") case against Monsanto (**Recommendation 31**).

Long-term infrastructure planning.

Planning our infrastructure systems over a timeline that sets us up for long-term success is crucial. If the state economy continues to grow and attract new jobs as planned, the Puget Sound region's population will roughly double by 2070. Higher or lower rates of economic growth would drive faster or slower human population growth. We should incorporate the long-term challenges of human population growth and climate change in a way that clearly recognizes the scale of each of these challenges during planning.

The state should provide local governments with funding as necessary to conduct facilities planning through 2070 that looks at population growth through a wastewater, stormwater and centralized and onsite sewage lens to ensure increased contaminant loads do not impact salmon and orcas (**Recommendation 32**).

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

In Year One, the task force recognized that its recommendations would not be successful without adequate funding, information and accountability mechanisms in place. They developed three recommendations to support effective implementation, presented below with their respective progress indicator as of November 2019. Refer to **Appendix 2** for a detailed dashboard of Year One recommendations and progress made on each.

Table 5. Year One funding, information and accountability recommendations - progress as of November 2019.

Progress	Recommendation	
	34	Provide sustainable funding for implementation of all recommendations.
	35	Conduct research, science and monitoring to inform decision making, adaptive management and implementation of actions to recover Southern Residents.
	36	Monitor progress of implementation and identify needed enhancements.

Progress highlights:

The enacted 2019–21 biennial budgets (operating, capital and transportation) provided $1.1 billion to support the recovery of Southern Residents and implement the recommendations of the Governor's Southern Resident Orca Task Force (summarized above under Goals 1, 2 and 3).

Outstanding needs:

Although significant additional investments occurred in the 2019–21 biennium, considerable outstanding costs for implementing projects and programs for salmon and orca recovery remain. These investments are necessary to ensure that funding, information and accountability mechanisms are in place to support effective implementation of the task force's Year One and Year Two recommendations.

Transition one-time investments in orcas and salmon in 2019 into ongoing investments.

Much of the increase in funding that WDFW received as part of the Southern Resident orca package was one-time funding. To most benefit orcas, this funding should be sustainable (**additional component of Recommendation 34, requires legislative funding**).

Provide funding to evaluate the effectiveness of task force recommendations.

Provide funding to PSP, WDFW, the Governor's Salmon Recovery Office and Ecology to evaluate the effectiveness of task force recommendations through monitoring and adaptive management while leveraging existing efforts (**urgent action on Recommendation 35, requires legislative funding**).[3]

[3] Note that all research projects are carefully reviewed and authorized under the Endangered Species Act and Marine Mammal Protection Act in the United States. The review includes assessments under the National Environmental Policy Act, consultation under Section 7 of the ESA. Any invasive techniques are also reviewed by an Institutional Animal Care and Use Committee. Cumulative impacts of all research projects and benefits to conservation are considered and the permits are issued with conditions to minimize impacts, facilitate coordination among researchers, and also to limit the number of research boats in close proximity to the whales at any time. NOAA Fisheries and Department of Fisheries and Oceans Canada have been working together to host transboundary research coordination calls and meetings so that the research community is well informed about plans for all field activities, can collaborate, and communicate well during their field seasons.

Chapter 3. Emerging issues addressed in Year Two

Introduction

Since the task force finalized its Year One recommendations in November 2018, additional **contaminants** considerations emerged (including the impacts of human sources of nutrients) and were evaluated by the working groups, steering committee and task force, as outlined below. These deliberations resulted in **five new task force recommendations**.

The task force also discussed long-term needs, including an oversight committee or similar body to **continue the mission of orca recovery after the task force sunsets in 2019**. The task force developed **one new recommendation** for the formation of this oversight body which will monitor progress, advocate for the implementation of the task force's recommendations and adapt to changing conditions by issuing new recommendations as needed. This recommendation includes three options for the Governor's Office to consider.

Additional long-term considerations evaluated by the task force in 2019 included the impacts of climate change and a growing human population on Southern Resident health and recovery. Left unchecked, both of these overarching threats are expected to exacerbate current stresses on the Southern Residents and undermine recovery efforts. Leveraging knowledge gained through presentations from experts, subgroup meetings and reviewing available research, the task force developed **five new recommendations to address the impacts of climate change** and **two new recommendations to respond to the impacts of a growing human population**.

Refer to **Appendix 1** for actions and implementation details related to the 13 new recommendations developed and approved by the task force in 2019.

Contaminants

Regulatory rollbacks at federal and state level

The regulations that protect Southern Residents from contaminant threats are a mixture of state and federal laws and implementation. Historically, the relationship between state and federal regulators has been characterized by cooperative federalism and delegated authority. This historical precedent is being challenged through federal regulatory rollbacks to the Clean Water Act (including water quality standards and the definition of Waters of the U.S.), Endangered Species Act and other foundational laws. Given the current federal regulatory environment, the governor and state agencies should ensure that state authority, rules and regulatory protections are sufficient to prevent moving backwards. The state should maintain and strengthen state authority, rules and regulatory protections.

NEW Recommendation 37: Protect against regulatory rollbacks at the federal and state level.

- Refer to **Appendix 1** for related actions and implementation details.

Minimum standards for local stormwater funding

A primary barrier to effective stormwater management is local government capacity to implement stormwater management programs. With too little staff capacity or limited capital funding, it is unlikely that jurisdictions will be capable of innovating, or even implementing requirements expected to be more stringent in the future. In many cases, local governments with the best, most intact natural resources often have the least capacity protect them.

Local government spending on stormwater programs varies from jurisdiction to jurisdiction, leaving some programs without adequate funding. Additionally, it can be problematic when stormwater funding is forced to compete with other "general fund" priorities. We should seek to better understand the varying funding streams, relative funding rates, and what can reasonably constitute adequate funding for different jurisdictions.

It would be beneficial for existing county and city organizations or workgroups to convene a meeting of jurisdictions in the Puget Sound region to identify what funding levels would be adequate to meet the need to control stormwater, explore funding alternatives and discuss how to establish a "floor" for minimum investments. The Washington State Department of Commerce and Washington State Department of Ecology should participate in those discussions. With a better understanding, the state should explore legislation to set minimum standards for local stormwater funding, ensuring that all programs have the resources necessary to protect water quality.

NEW Recommendation 38: Explore setting minimum standards for local stormwater funding to ensure that all programs have the resources necessary to protect water quality.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

Human sources of nutrients

In addition to the emerging contaminants-related considerations described above, Ecology's 2019 Salish Sea Modeling Report[4] evaluated the impact of human sources of nutrients on Puget Sound water quality. The report found that the excess of nutrients from human sources is causing or contributing to low dissolved oxygen in many sensitive inlets and bays within Puget Sound, resulting in oxygen levels that fall below the concentrations needed for marine life to thrive.

Significant human sources of nutrients in diffuse or direct discharges can include municipal wastewater, agriculture, forestry and other land use activities. In addition to lowering dissolved oxygen, excess nutrients can impair the foundations of the marine food web by degrading the habitat and water quality conditions conducive to healthy and robust populations of marine species.

Recommendations 39, 40 and 41 below were developed by Ecology and informed through discussions with regional stakeholders and tribes at the Puget Sound Nutrient Reduction Forum to address these threats. Refer to **Appendix 4** for further information on the impacts of human sources of nutrients on marine water quality.

National Pollutant Discharge Elimination System permit framework

Discharges from wastewater treatment plants represent more than 50% of the human sources of nutrients into Puget Sound and contribute significantly to low dissolved oxygen levels. Ecology proposes developing a Puget Sound Nutrients General Permit to control nutrient discharges from domestic wastewater treatment plants (sewage treatment plants) through its National Pollutant Discharge Elimination System[5] regulatory authority. The alternative to a general permit is to include nutrient control requirements in each wastewater treatment plant's individual permits, one by one, as they are reissued over the next five to 10 years.

[4] The Salish Sea Model is a three-dimensional scientific and engineering simulation of hydrodynamic and water quality processes in Puget Sound, the Strait of Juan de Fuca, and the Strait of Georgia, as well as inputs from 64 rivers and streams and 99 facilities/point sources (mostly municipal wastewater treatment plants) in the U.S. and Canada. The model includes simulated water quality features including a total of 19 state variables, two species of algae, dissolved and particulate carbon, and nutrients [68].

[5] Created in 1972 by the Clean Water Act, the NPDES permit program regulates point sources that discharge pollutants to U.S. waters. The permit provides two levels of control: technology-based limits and water quality-based limits [77].

NEW Recommendation 39: Develop a National Pollutant Discharge Elimination System permit framework for advanced wastewater treatment in Puget Sound to reduce nutrients in wastewater discharges to Puget Sound by 2022.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

Aligning nonpoint source programs with nutrient reduction activities

Ecology should establish minimum requirements for nonpoint source best management practices to ensure they meet water quality standards. Existing nonpoint source programs can be expanded to address known problems related to nutrient runoff from agricultural, suburban/urban and rural land use activities. Many of these nonpoint source implementation actions have multiple benefits for water quality improvement, including nutrient reduction.

NEW Recommendation 40: Better align existing nonpoint programs with nutrient reduction activities and explore new ways to achieve the necessary nonpoint source nutrient reductions.

- Refer to **Appendix 1** for related actions and implementation details.

Collecting high-quality nutrient data in watersheds

Making science-based nutrient management decisions depends on having the right tools and high-quality data. The Salish Sea Model is our best tool for understanding the marine waters of Puget Sound and evaluating the best suite of nutrient load reductions necessary to achieve water quality standards. Ecology should augment key watershed monitoring stations with continuous nutrient monitoring technology to improve our understanding of watershed nutrient loads and establish baseline conditions to measure future change.

NEW Recommendation 41: Collect high-quality nutrient data in watersheds to fill key knowledge gaps of baseline conditions.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

Climate change and ocean acidification

Southern Resident orcas are highly endangered, making them especially sensitive to changes in their environment. Climate change, ocean warming and increasing ocean acidification compound the stressors already limiting their survival and the productivity of their food web, undermining ongoing recovery efforts.

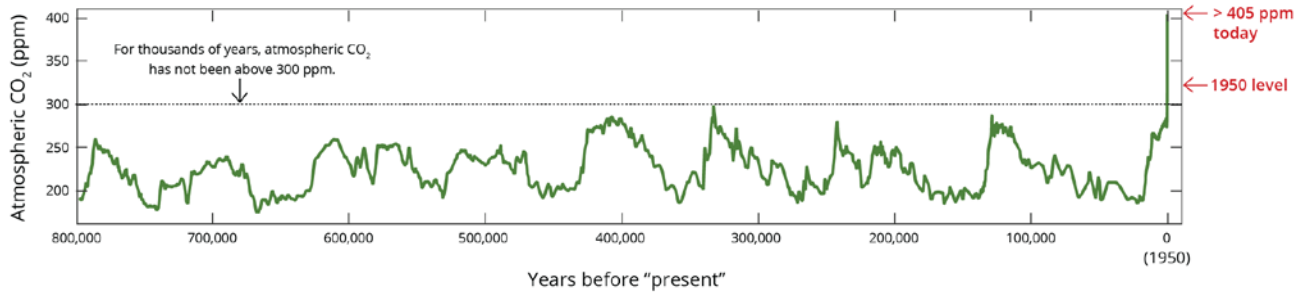
In response, the task force urges immediate and aggressive action in Washington state and beyond to reduce human-caused greenhouse gas emissions, consistent with the best available science, and to increase the resilience of our ecosystem to climate-induced changes. Findings and

recommendations related to addressing the impacts of climate change and ocean acidification on Southern Residents are presented below, along with cross-cutting recommendations that address root causes and increase resiliency.

Human-caused emissions

As shown in **Figure 2**, the level of carbon dioxide in the atmosphere remained below 300 parts per million for thousands of years prior to 1950 [18]. Human activities related to transportation, electricity, industry and consumption have increased accumulation of CO_2 in the atmosphere to 405 ppm, causing global temperatures to rise by about 1°C above pre-industrial levels [18]. About 25% of these CO_2 emissions are absorbed by the ocean, resulting in ocean acidification, or the decrease of oceanic pH [18].

Figure 2. Atmospheric carbon dioxide parts per million over the past 800,000 years [18].



Human activity also releases other potent greenhouse gases, which are rapidly accumulating in the atmosphere and are major drivers of climate change. For example, methane gas is emitted as a byproduct of coal and natural gas production, distribution and use, as well as from the agriculture and waste management sectors. Methane is 34 times more potent than CO_2 over a 100-year period and 86 times more potent over a 20-year period, magnifying its short-term impact on climate change relative to CO_2 emissions [19].

Although the effects of climate change are already observable due to the current 1.0°C increase in global temperatures, human activities continue to add approximately 0.2°C to global average temperatures each decade [18]. Scientists project catastrophic and irreversible changes to life on Earth when global warming surpasses 1.5°C, with even greater consequences after 2.0°C. For example, 1.5°C of warming is projected to cause marine fisheries to decline by 4.5 million metric tons, while 2.0°C of warming is projected to cause a 6.0 million metric ton decline (1.3 times worse) [18].

If current trends continue, the University of Washington Climate Impacts group projects that 1.5°C of warming could be reached as soon as 2030 and will result in the following conditions in Washington [18]:

- 67% more days above 90°F
- 38% decrease in snowpack
- 16% increase in winter streamflow
- 23% decrease in summer streamflow

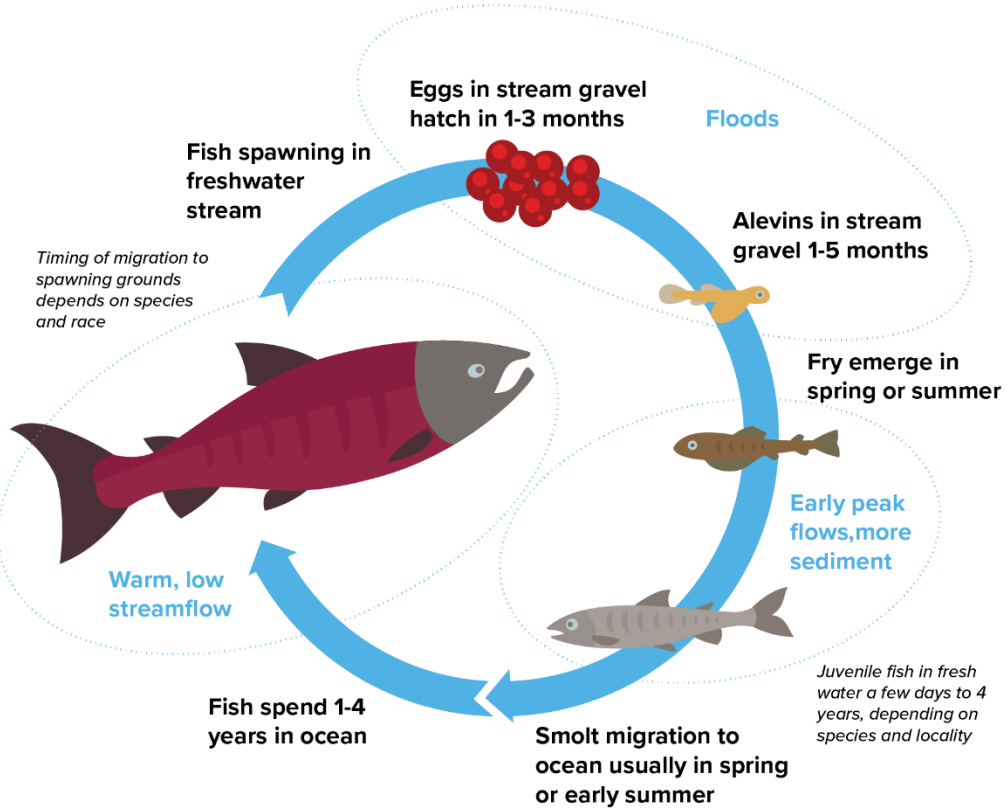
Without significant reductions in emissions of CO_2 and other greenhouse gases, global average warming will likely reach 1.5°C between 2030 and 2052 [18]. These changes will lead to further deterioration in conditions for the Southern Residents and their prey, underscoring the urgency of action to limit emissions and stabilize global temperatures.

To limit warming to 1.5°C, globally we must reduce global CO_2 emissions by 45% from 2010 levels by 2030 and reach net zero emissions by about 2050 [18]. To limit warming to 2.0°C, globally we must reduce global CO_2 emissions by 25% from 2010 levels by 2030 and reach net zero emissions by about 2070 [18].

Climate change effects on Southern Residents

Climate change is already exacerbating existing stresses on Southern Residents and the ecosystems upon which they depend, including salmon and forage fish. As temperatures continue to rise, Southern Residents will be affected primarily through their food web. Higher temperatures will impact salmon habitats and populations at each life stage (**Figure 3**).

Figure 3. Effects of climate change on salmon throughout their lifecycle (modified from The Wilderness Society, 1993).



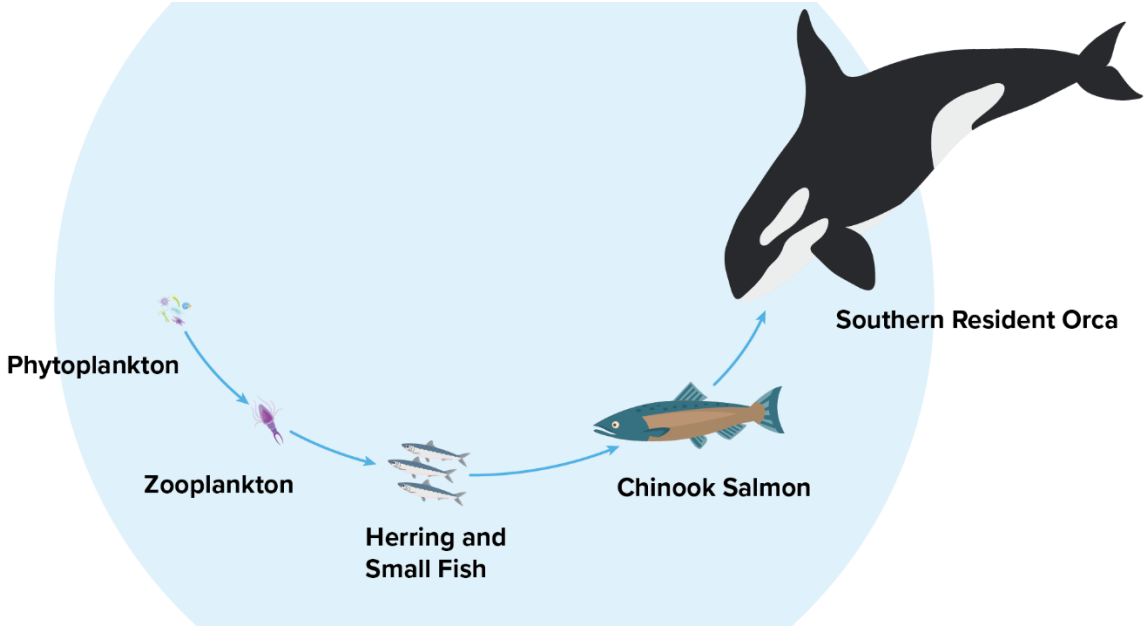
The Cascade Mountains have seen a 25% decrease in snowpack levels since 1950 due to increasing global temperatures, which cause this snow to melt earlier [20]. At the same time, heavier winter rainstorms caused by a warming climate lead to flooding and other high-flow events. These conditions cause more water to enter streams during the winter (nearly a 20% increase since 1950) [20], which can scour riverbeds and destroy or smother salmon redds (nests), increasing egg and fry mortality. Flooding can also increase the amount of sediment entering streams, burying spawning gravels.

Lower snowpack and changing precipitation patterns caused by the warming climate are also damaging salmon populations by lowering summer streamflows. Although winter streamflows continue to increase, summer streamflows have decreased up to 15% since 1950 [20]. Lower streamflows in the summer increase water temperature, which decreases suitable salmon habitat, shifts salmon activities upstream and impedes migration. Increasing water temperatures act as a pollutant, placing further metabolic demands on salmon; warmer water depletes their energy reserves, reduces growth, increases disease susceptibility, impedes migration and increases vulnerability to predators. The end result is fewer salmon in our streams, rivers and oceans — and, consequently, less food for the Southern Residents.

Most Puget Sound glaciers are in decline, with measured volume decreases ranging from 56% loss in the North Cascades from 1900–2009 to 34% in the Olympic Range from 1980–2009 [21]. Glacial melt caused by warming temperatures affects the streams, aquifers and river systems on which juvenile salmon and their prey depend, thereby impacting Southern Residents at the top of the food chain. These declines will continue, increasing summer meltwater from some glaciers in the near term but dramatically reducing meltwater in the second half of the 21st century. Other impacts that affect salmon, forage fish and the viability of the food web include increased localized flooding, erosion and sedimentation [21].

In the marine environment, warming ocean temperatures can affect the base of the orca food web, changing the phytoplankton and zooplankton composition to lower-calorie species (**Figure 4**) [22, 23]. Warming ocean temperatures also decrease oxygen levels and promote the abundance of harmful algal blooms (toxic to fish) and plankton grazers such as jellyfish, which are a caloric dead-end in the food web due to their few predators [24, 25]. These issues can ripple out into 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.

Figure 4. Southern Resident orca food web diagram.



Warmer ocean temperatures can also bring more predators into the region, favoring warm-adapted nonnative fishes that could outcompete or prey on salmon [26]. They also reduce kelp abundance, resulting in a loss of critical fish habitat [27, 28]. Higher ocean temperatures also promote new pathogen and disease vectors that could be harmful for orcas, while accelerating the rate at which excess human nutrients change the base of the marine food web.

Further, as sea levels rise, long-buried, legacy shoreline waste sites are likely to become inundated, resulting in a new source of toxics entering the marine environment and inland waters. Combined sewer overflows and overflows from sewage treatment facilities occur more frequently with flooding and high-flow events, increasing the quantity of toxic substances that enter water bodies. The region is already experiencing an increase in combined sewer overflow events that cause untreated sewage to enter marine and inland waters. As orcas starve from insufficient prey, they metabolize more of the toxics stored in their bodies, increasing their potential to experience neurological problems and disease.

Similarly, sea level rise caused by climate change will permanently inundate and destroy coastal habitat, which is important for juvenile salmon and their prey. It will also reduce habitat and spawning grounds available to forage fish, which spawn in the intertidal and shallow subtidal zones. For example, surf smelt and sand lance depend on high, extensive beaches for spawning. With sea level rise, beaches will naturally tend to migrate inland. Bulkheads and other structures may impede this movement and complicate both natural and human efforts at resiliency and adaptation [29].

Collectively, these impacts compound existing stressors on Chinook, further reducing their abundance and leaving Southern Residents hungry. Many of these changes have already been observed in the Pacific Northwest. For example, during the drought of 2015, average air temperatures were approximately 2.7°C warmer than pre-industrial averages and Washington state snowpack was 70% below normal [18]. These conditions led to low summer streamflow and warm waters, resulting in lethal strandings, fishery closures and die-offs of salmon and steelhead across the Pacific Northwest, including over 250,000 Columbia River sockeye salmon [18].

In 2015–16, the region also experienced a marine heat wave, with ocean temperatures up to 7°C warmer than average, and the emergence of “the blob” — a large mass of water off the coast with temperatures 5.4 °F above normal. These conditions triggered the largest and most persistent harmful algal bloom ever recorded on the West Coast and contributed to weak salmon returns. In the summer of 2015, the Hoh Rain Forest received 0.17 inches of rain in June — the lowest rainfall on record. Water temperatures spiked inland. The state experienced some of its most intense wildland fires on record. Human bucket brigades helped deepen channels in the Dungeness River with volunteers hand-carrying fish over obstacles to try to mitigate the impact of these events.

These conditions reduced survival among young salmon, caused humpback whales to become entangled in fishing gear as they hunted closer to shore, stranded thousands of young sea lions on beaches as their mothers foraged far out to sea, and caused an algae bloom that shut down crabbing and clamming activities. The Washington Department of Fish and Wildlife lost about 1.5 million juvenile fish in overheated rivers and streams. State and federal agencies declared several fisheries to be disasters and many fisheries closed. While the origins of these warmer

waters are not fully understood, their presence is unprecedented and portends risks in the years ahead from a warming planet.

Ocean acidification effects on Southern Residents

While the changes described above are due primarily to elevated CO_2 accumulation in the atmosphere, ocean acidification results from atmospheric CO_2 being absorbed by the ocean. CO_2 reacts with marine waters to form carbonic acid, which increases hydron ion (H+) concentrations and results in lower oceanic pH.

Although climate change and ocean acidification are related (and both stem from CO_2 emissions), the term "climate change" refers to the changes in the Earth's heat budget, which cause global warming and changes in weather patterns. The term "ocean acidification" specifically refers to the lowering of ocean pH resulting from absorption of CO_2 from the atmosphere and does not include the warming of the ocean [30].

Ocean acidification is progressing 10 to 100 times faster than it did in the previous 50 million years, outpacing inhabitants' ability to adapt and evolve to the changes [31]. Pacific Northwest waters are particularly vulnerable to ocean acidification due to several contributing factors:

- Atmospheric CO_2 in the Puget Sound area is increasing faster than the global average [32].
- Puget Sound is colder and has more freshwater (salt-free) than the global average, allowing CO_2 to dissolve more effectively [31].
- Natural upwelling mixes deep waters with the already-acidified surface water layer [33]. These deep waters carry increasing amounts of legacy human-generated CO_2 from 30 to 50 years ago when the water was last in contact with the atmosphere [33]. As a result, conditions will continue to acidify from upwelled waters for several decades due to the existing carbon load [33].
- Ocean waters receive freshwater discharge from surrounding rivers and streams. Freshwater is typically more acidic than the ocean and carries dissolved nutrients like nitrogen, phosphorous and organic carbon. These nutrients enter the marine environment and contribute significantly to ocean acidification in certain areas of Puget Sound by adding CO_2 to the water as a product of microbial decomposition [33].
- Scientific studies suggest that nutrients can also stimulate harmful algal blooms, which may produce more toxins under acidified conditions [33]. Human sources of nutrients, such as sewage treatment plants, septic systems and runoff from both urban and rural land practices (e.g., lawn fertilizers and livestock) are significant contributors to acidification in many parts of Puget Sound.

Ocean acidification is already affecting shellfish in Puget Sound — particularly juvenile forms such as oyster larvae — and threatens to undermine the livelihoods of rural communities that

grow oysters and harvest crabs commercially [29]. The phenomenon primarily impacts Southern Residents and salmon through their highly interconnected food web (**Figure 4**), the same system on which all apex predators depend for survival. Zooplankton species such as pteropods and copepods that support the base of the orca food web grow more slowly in acidified waters [33].

Recent studies on juvenile coho salmon exposed to low-pH water 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, rather than typical fear and avoidance. Olfaction plays a central role in salmon survival, navigation and reproduction. These neural signaling pathways are highly conserved across many species, indicating that other salmon species could be at risk as well [34]. 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 [35, 36].

Ocean acidification also increases the bioavailability of metals including iron and copper in orcas, which has the potential to adversely affect the food web and orcas over time. Further, ocean acidification extends the spatial spread of underwater noise (for frequencies up to 10kHz), making it more difficult for orcas to communicate [28, 37]. Ocean acidification will continue to "amplify" underwater noise by reducing the natural absorption of sound at lower frequencies, allowing sounds to propagate further and making it harder for orcas to locate their prey [28, 37].

New goal and recommendations

Existing stressors on endangered Southern Residents and Chinook have already increased their likelihood of extinction. Without intervention, the compounding effects of changing ocean conditions due to climate change will continue to exacerbate these stressors, pushing Chinook salmon and orcas even closer to the tipping point. In response, the task force developed the following new goal and set of recommendations, summarized here and outlined with supplemental action items and implementation details in **Appendix 1**:

> **Goal 5: Reduce the threat from climate change, including ocean acidification, to Southern Residents, the region's biodiversity and, ultimately, the well-being of Washington's people and economy.**

The task force urges aggressive and sustained action in Washington state to (1) do its part to reduce human-caused emissions, consistent with the best available science and the goal of limiting planetary warming to 1.5-2.0 °C, (2) minimize the causes and consequences of ocean acidification and (3) act aggressively to increase the resiliency of the habitat and ecosystems that orcas and salmon depend upon for their survival.

As an overarching guiding principle and approach to doing business, state agencies responsible for implementing task force recommendations should adopt a "climate lens" to ensure that

actions and investments are made based on the best available science, and include a focus on monitoring ecosystem changes and impacts, increasing resiliency and adapting to impending changes. Most recent climate projections and modeling should be incorporated into assessments and decision-making.

Five recommendations to achieve these outcomes and support Goal 5 are presented below; they encompass short-, near- and longer-term actions identified to benefit orcas now and over time. Progress must be made on each one to enable the survival of the Southern Residents.

Reducing human-caused greenhouse gas emissions.

Most of the greenhouse gas emissions in Washington state are from transportation, electricity generation and residential, industrial, commercial and agricultural activities. The task force urges all members of the Washington community to examine their own contributions to climate change and both directly take, and advocate for, forceful action and policies to reduce emissions.

NEW Recommendation 43: Take aggressive, comprehensive, and sustained action to reduce human-caused greenhouse gas emissions, with the goal of achieving net zero emissions by 2050.

- Requires legislative funding and policy.
- Refer to **Appendix 1** for related actions and implementation details.

Reduce, remediate, and adapt to ocean acidification.

The task force supports continued implementation of actions in the state's Ocean Acidification Action Plan and the Marine Resources Advisory Council's recommended priorities. Washington should continue leading, collaborating, advocating for and advancing policies at the regional, national and international levels in partnership with leading state-based businesses and organizations, elected officials and others.

NEW Recommendation 44: Increase Washington's ability to understand, reduce, remediate, and adapt to the consequences of ocean acidification.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

Accelerate action to increase resiliency of salmon populations.

Fully implement and fund salmon recovery plans. Increase access to cold water habitats and refugia. Selectively remove, design and retrofit infrastructure to ensure climate resiliency and account for future changes in flows and water temperatures. Significantly increase the scale and scope of habitat protection and restoration investments that focus on habitat complexity to increase the diversity and resiliency of wild and hatchery salmon stocks.

NEW Recommendation 45: Mitigate the impact of a changing climate by accelerating and increasing action to increase the resiliency and vitality of salmon populations and the ecosystems on which they depend.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

Pursue maritime innovations that benefit Southern Residents.

Although reducing emissions is a top priority, underwater noise is another serious concern. While some emerging vessel propeller technologies may reduce emissions, they can also increase underwater sounds at frequencies that interfere with orca communication and echolocation. Addressing this trade-off will require research, innovation and investment to develop and deploy technologies that reduce both noise and carbon emissions.

To catalyze this research and innovation, the task force recommends supporting Washington Maritime Blue, a strategic alliance for maritime innovation and sustainability. Maritime Blue is an independent, nonprofit partnership between industry, the public sector, research and training institutions and community organizations tasked with implementing Washington State's Strategy for the Blue Economy. Maritime Blue should modify its governance structure (for example, by creating a dedicated board member seat or subgroup) to address Southern Resident orca issues and coordinate closely with the successor to this task force.

NEW Recommendation 46: Expand the Governor's Maritime Blue scope of work and provide funding to implement recommendations from the Southern Resident Orca Task Force and pursue shipping and other maritime innovations that benefit Southern Residents.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

Mitigate increased threats from contaminants due to climate change and ocean acidification.

With runoff anticipated to increase as climate change drives increased precipitation, flooding and sea level rise, additional work is needed to address increasing levels of contaminants in the state's waters. Nutrient loadings will increase with these events, and exposure to other toxics could increase as well. Increased bioavailability of toxics will accumulate up the food chain, ultimately threatening Chinook. In addition, the increased quantity and intensity of flows due to climate change are highly problematic, impacting the hydrology of basins and water systems and destroying forage fish and Chinook habitat.

The task force recommends adapting stormwater retrofits to account for the impacts of climate change, accelerating clean-up of toxics and waste sites, modifying or moving treatment facilities to withstand sea-level rise and increased flooding and increasing protection for low-lying infrastructure facilities (without hardening adjacent shorelines).

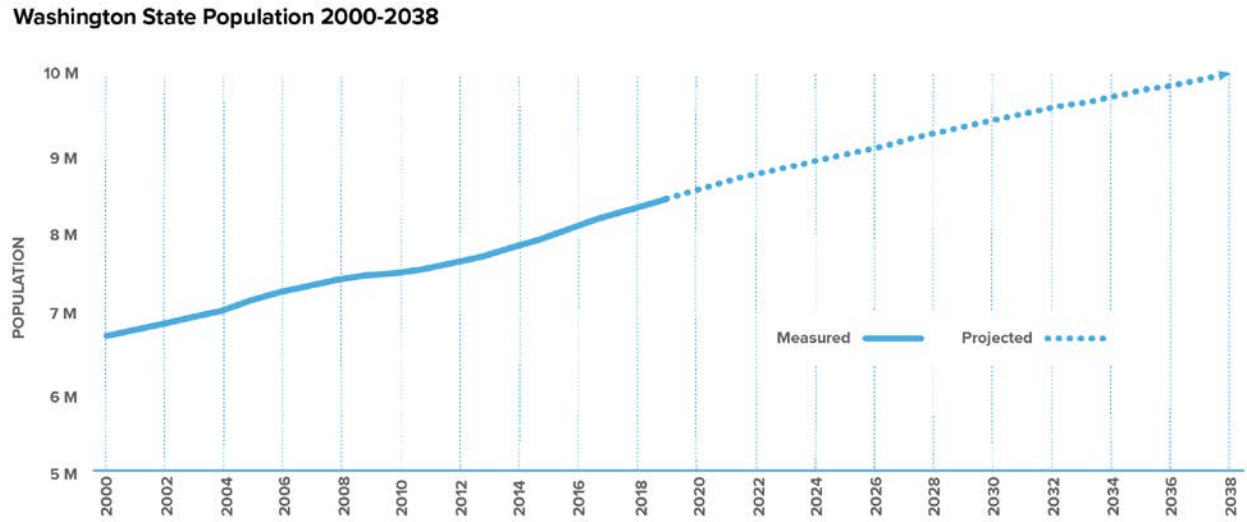
NEW Recommendation 47: Identify and mitigate increased threats to Southern Residents from contaminants due to climate change and ocean acidification. Prioritize actions that proactively reduce exposure where the increased impacts are expected to be most severe.

➲ Refer to **Appendix 1** for related actions and implementation details.

Human population growth and development

As shown in **Figure 5**, Washington's population has grown over 30% in the past 20 years — increasing by an average of 87,900 people each year — primarily due to net migration into the state (people moving in versus moving out) [38]. While this growth is indicative of strong economic opportunities in the state, uncoordinated and unplanned growth can pose a threat to the environment.

Figure 5. Washington population growth from 2000, projected to 2038 [39].



The Growth Management Act, adopted by the Legislature in 1990, recognizes this tradeoff and provides a series of statutes requiring cities and counties to develop comprehensive plans for managing their population growth [40]. These plans are designed in part to prevent net loss of ecological functions by reducing sprawl and protecting natural resources. Similarly, the Shoreline Management Act requires counties and cities with shorelines to develop and implement shoreline master programs to prevent uncoordinated development of shorelines and includes the "no net loss" of ecological function standard.

Despite the components of the GMA and SMA intended to protect natural resources and sensitive ecosystems, important wildlife habitat lands are being converted for development faster than they are being restored. At the current rate of human population growth and development, a "business as usual" approach to zoning, transportation, wastewater regulations and infrastructure

will result in continued loss of critical habitat, further imperiling salmon and orcas. Without substantial changes, we will not recover salmon or orcas.

New goal and recommendations

To prevent further degradation of critical habitat and restore what has already been lost, the task force urges transformational change to Washington's growth management regulations and practices. The GMA and SMA should be more responsive to the needs of the ecosystem, treating habitat as critical public infrastructure and emphasizing protection over mitigation. In response, the task force developed the following new goal and set of recommendations, summarized here and outlined with supplemental action items and implementation details in **Appendix 1**:

> **Goal 6: Reduce the threats from population growth and development on the important habitats, sensitive ecosystems and food webs that Southern Residents orcas rely on.**

Habitat

The task force urges shifting away from the "no net loss" standard — which has not successfully prevented the loss of critical habitat and sensitive ecosystems — toward a "net ecological gain" standard. Net ecological gain in this context refers to taking actions through development and land management that result in improvement to the quality and quantity of the functions of the natural environment. Key elements include:

- Following the mitigation sequence of first avoiding impacts, then minimizing impacts and finally — offsetting impacts that cannot be avoided. Recognizing that mitigation efforts aimed at no net loss have not achieved and are not likely to achieve 100% success at offsetting impacts, additional mitigation should be required.
- Establishing and defining the environmental baseline from which we are measuring improvement.
- Considering future population projections or sea level rise predictions that could compromise ecological gains.
- Considering local site-specific and a larger watershed scale.

This lens should be adopted to (1) prevent environmental harm associated with growth and (2) use ongoing development and retrofitting opportunities to improve ecological conditions. Adequate funding and support are essential to both state natural resource agencies and local governments to engage with communities, update policies and regulations and effectively implement and enforce statutes that protect habitat.

NEW Recommendation 48: Adopt and implement policies, incentives and regulations for future growth and development to prevent any further degradation of critical habitat and sensitive ecosystems; enable and channel population growth in ways that result in net ecological gain; evaluate and report outcomes for all jurisdictions at the state, county, tribal and municipal levels.

- Requires legislative funding and policy.
- Refer to **Appendix 1** for related actions and implementation details.

Fast ferries and water taxis

According to Puget Sound Harbor Safety Committee bi-monthly report summaries, the volume of fast ferry and water taxi traffic has risen dramatically in recent years, and the levels rank near the top of all vessel classes in Puget Sound (but far exceeded by Washington State Ferries and tugs and barges). Based on Puget Sound Partnership's assessment of automatic identification system information, such vessels travel over 300,000 miles (in more than 10,000 hours) annually in Puget Sound.

Since issuing its recommendations in 2018, the vessels working group and task force became aware of the development of several new fast ferry and water taxi operations in Puget Sound. Kitsap Transit and King County currently operate fast ferries, with other communities planning similar operations to the south and north. These ferries make multiple roundtrips in the morning and afternoon, traveling at relatively high speeds in an area frequented by Southern Residents (especially in the fall).

The vessels working group expressed concerns about the elevated risk of collisions with Southern Residents as some of these vessels can travel faster than the top speed of orcas. The emergence of similar fast ferry networks elsewhere in the world (e.g., the Canary Islands and Korea) has led to more ship strikes with whales and dolphins. The International Whaling Commission has recommended several precautionary measures to mitigate related risks [41].

The task force urgently recommends working with the fast ferry and water taxi sector on potential bridge lookout policies and technological mitigations due to (1) the small size of the Southern Resident population, (2) evidence of collisions leading to the injury or death of Southern Residents and (3) the comparatively high vulnerability of calves and other young whales to this potential threat.

NEW Recommendation 49: Conduct a comprehensive environmental review and take action to minimize potential whale-strike risk and underwater noise posed by the growing number and distribution of fast ferries and water taxis in Southern Resident critical habitat.

- Refer to **Appendix 1** for related actions and implementation details.

Chapter 4. Continuing the mission of Southern Resident orca recovery

The Southern Resident Orca Task Force sunsets on November 8, 2019. After this point, it is critically important that an oversight committee or similar body continues to monitor progress, advocate for the ongoing implementation of the recommendations and adapt to changing conditions by issuing new recommendations as needed. The task force agreed that executive-level attention in the Governor's Office coupled with professional support from state agencies is needed to fulfill the mission of orca recovery. State agency leaders contributed significant staff resources and technical expertise over the past two years to support the task force; however, without additional oversight, these orca-focused efforts could easily be displaced by other business that the agencies conduct. As such, the task force recommends the following path forward:

NEW Recommendation 42: Create one or more entities with authority and funding to recover and advocate for Southern Resident orcas by implementing task force recommendations, creating new recommendations as needed and reporting to the public, governor and tribal co-managers on status.

- Requires legislative funding.

The task force recommends that any oversight group incorporates the following elements:

- Is co-managed by the Governor's Office and tribes.
- Coordinates with federal agencies in both the United States and Canada to stay connected to ongoing policies around species recovery.
- Aligns with governor's priority on diversity, equity and inclusion and environmental justice.
- Maintains some element of the working group structure and provides ongoing support and facilitation of working groups by state agencies.
- Continues engagement with nonprofits, businesses and other stakeholders to monitor implementation of existing recommendations, consider new recommendations and recommend course corrections for continued recovery.
- Maintains and enhances public visibility and interest in this crisis and facilitates a robust public engagement process.
- Builds on ongoing monitoring and reporting to maintain accountability to the public.
- Maximizes institutional durability, at least until the population reaches 84 whales by 2028.[6]

The task force has identified three general options (not listed in priority order) for moving this recommendation forward. By selecting one of the following options, the state can better ensure that between now and 2022, we witness evidence of consistently well-nourished whales, more live births and the survival of several thriving young orcas. With adequate consistency and attention, by 2028, we could 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 finally see their population increase to 84 whales — an increase of 10 whales in 10 years. Options are summarized below:

Option 1: Expand existing agency capacity.

Expand the capacity and function of the Governor's Salmon Recovery Office to include orca recovery (e.g., Governor's Salmon and Orca Recovery Office). This option leverages existing agency infrastructure in the GSRO and is modeled after the Salmon Recovery Funding Board, with policy coordination and administration functions within the proposed Governor's Salmon and Orca Recovery Office and a policy board of governor-appointed members and agency heads.

Option 2: Create a new executive level team in Governor's Office.

Create an executive-level salmon and orca leadership team in the Governor's Office. This option includes explicit tribal co-manager engagement by the Governor's Office. This option

[6] In its 2018 report, the task force set forth the goal of increasing the Southern Resident population to 84 whales by 2028, or "10 more whales in 10 years."

houses the main functions of the policy leadership team within the Governor's Office and maintains an executive-level focus on recovery.

Option 3: Create a new orca recovery office.

Create an orca recovery office led by technical experts. This option creates a new office that is staffed to implement actions. This office can be located within the Governor's Office or within an existing agency. The key element of this option is that it is not a stakeholder-led process.

The task force also recommends incorporating PSP's recovery system into any of these options, as appropriate. PSP is well positioned to contribute to vessels recommendations, coordinate with Canadian representatives and actions, support scientific monitoring, advise on communications and track progress. Likewise, Salmon Recovery Councils on the Columbia River and Washington Coast could be useful partners.

Table 6 and **Appendix 5** provide additional implementation details on the three options summarized above for the Governor's Office to consider. The task force has laid a foundation for the Southern Resident recovery; strong governance will be necessary to build on this foundation with immediate, sustained and meaningful action.

Table 6. Summary of proposed options for continuing Southern Resident orca recovery.

Option 1	Option 2	Option 3
Governor's Salmon and Orca Recovery Office	**Governor's Salmon and Orca Leadership Team**	**Governor's Orca Recovery Office**
SUPPORT		
Puget Sound Partnership Recovery System • Science, monitoring, and adaptive management • Coordination with Canada, Columbia, and the Coast • Tracking and updating recommendations • Vessels • Communications		
Columbia River and Coast Salmon Recovery Councils • Science, monitoring, and adaptive management • Tracking and updating recommendations		
STRUCTURE		
Leadership and representation		
• Governor-appointed executive-level board or council to oversee orca recovery. • GSRO provides policy support in coordination with the Governor's Office. • Executive-level membership includes appointments by the governor, ex-officio state agency representatives and tribal representatives. • Staffed by designated agency representatives.	• Governor's Office leadership as Chief Executive in co-manager role with tribes. • Governor-appointed Leadership Team monitors implementation of existing recommendations, considers new working group recommendations, and recommends course corrections.	• Executive team chaired or co-chaired by technical experts. • Team size should be lean and nimble. • One or two leads for each threat (prey abundance, contaminants, vessel impacts, climate change, population growth, and any new/emerging threats). • Tribal representatives participate as they see fit.
Reporting structure		
• GSRO statutory authority expanded to include orca recovery ("Governor's Salmon and Orca Recovery Office").	• Leadership Team meets twice per year (open to public). • Reports to the public, governor, and tribes as co-managers, with biennial comprehensive reviews and brief annual updates.	• Reports directly to the governor or Governor's Recreation and Conservation Office; analogous to the GSRO. Governor's Office provide executive support and continuity between administrations.

Option 1	Option 2	Option 3
Governor's Salmon and Orca Recovery Office	**Governor's Salmon and Orca Leadership Team**	**Governor's Orca Recovery Office**
Key goals and actions		
• Maintain momentum and focus on orca recovery. • Coordinate policy and budget initiatives. • Coordinate the actions, science and progress through individual agencies.	• Maintain executive-level attention on salmon and orca recovery. • Track progress on Southern Resident Orca Task Force actions, recommend new actions, identify course corrections and maintain a broad coalition.	• Achieve orca recovery goals. • Prioritize and implement recommendations. • Amend and develop new task force recommendations. • Measure and track progress. • Promote transparency and accountability. • Identify roles and schedules for each recommendation.
PARTNERS AND STAKEHOLDERS		
Tribal co-managers		
• Tribes engage as co-managers on multiple fronts as appropriate, including appointments to the board or council.	• Accountable as co-managers. • Develop Leadership Team recommendations with stakeholders, agencies and others. • Members of working groups.	• Seats on council and working groups as co-managers. Additional roles per input from tribes.
Partner agencies		
• Hybrid executive-level and GSRO structure offers a statewide and transboundary perspective.	• Develop Leadership Team recommendations with tribes, stakeholders, and others. • Facilitate working groups. • Transboundary consultation.	• Collaborators and implementers.
Public		
• Engaged via multiple pathways.	• Consulted; public engagement brought these issues to the forefront and remains critical.	• Provides feedback and accountability.

Option 1	Option 2	Option 3
Governor's Salmon and Orca Recovery Office	**Governor's Salmon and Orca Leadership Team**	**Governor's Orca Recovery Office**
IMPLEMENTATION		
Effort and funding		
• GSRO staffing (one FTE). • Operational costs for the executive team and board coordination. • Agency staff support from PSP, WDFW, and ECY (three FTE).	• "Results Washington"-style meetings with the Governor and tribes. • Leadership Team meets twice annually (all-day public meetings). • Four working groups meet quarterly or semi-annually. • Website communication tools. • More detailed biennial report. • Agency staff support (PSP, DFW, ECY, GSRO) and facilitation contracts.	• Five to seven FTEs for Office (executive director, leads, public engagement). • Quarterly reports. • Technology (e.g., monitoring dashboard). • Communication and public engagement through dashboard, quarterly reports, and quarterly public meetings. • Stipend for working group travel.
Timeline		
• Could be implemented relatively quickly.	• By January 2020, transition to interim structure. • By winter/spring 2020, form new Leadership Team and secure legislative funding.	• Executive order to start as soon as possible, should be in place by end of legislative session or sooner.

Appendix 1. Southern Resident Orca Task Force final recommendations

In 2018, the task force developed a bold package of 36 recommendations that, if implemented, would collectively have the impact needed to achieve the vision of a thriving and resilient Southern Resident orca population. The task force continued these efforts in 2019 by:

- Evaluating progress made on Recommendations 1–36.
- Elevating recommendations that have not advanced enough to achieve their respective goals. **Urgent actions** emphasize one or more components of a Year One recommendation that has not advanced enough to achieve its goal. **Additional components** fill a gap in a Year One recommendation.
- Developing Recommendations 37–49 to address lessons learned and/or new issues that emerged since the release of the 2018 task force report.

The complete package of 49 recommendations outlined in this appendix are grouped under six overarching goals and include details for the governor, the Legislature, agencies and partners to consider during implementation. Recommendations 37–49 are embedded throughout the report under their respective goals (not presented in numeric order).

Legislative action required:

Policy		
• Recommendation 43	• Recommendation 48	

Funding		
• Recommendation 1	• Recommendation 19	• Recommendation 39
• Recommendation 2	• Recommendation 20	• Recommendation 41
• Recommendation 6	• Recommendation 30	• Recommendation 42
• Recommendation 12	• Recommendation 31	• Recommendation 43
• Recommendation 13	• Recommendation 32	• Recommendation 44
• Recommendation 14	• Recommendation 34	• Recommendation 45
• Recommendation 15	• Recommendation 35	• Recommendation 46
• Recommendation 16	• Recommendation 38	• Recommendation 48

Urgent actions on Year One recommendations:

Fully fund salmon recovery plans.

Increase funding and partnerships to fully implement priority habitat actions in salmon recovery plans, working with legislators, stakeholders and tribes. Focus on implementing habitat restoration and protection projects that local experts have prioritized in each salmon recovery region and that will benefit Chinook and Southern Residents. Ensure funding includes administration and local capacity-building to accelerate projects that are underway or have committed resources. Ensure greater collaboration between hatchery and habitat restoration efforts so that habitat is available to recover wild fish and for newly produced hatchery fish (**Recommendations 1, 2 and 6**).

Investigate and address pinniped predation.

Provide funding to the Washington Department of Fish and Wildlife to (1) determine if pinniped predation is a limiting factor for Chinook in Puget Sound and along Washington's outer coast and (2) more effectively manage pinniped predation in the Columbia River (**Recommendations 12 and 13**).

Increase early marine survival research and monitoring in Puget Sound.

Increase funding to Puget Sound Partnership and WDFW for salmon marine survival research and monitoring projects through the Puget Sound Action Agenda to ensure that results may be integrated in recovery and management plans, as appropriate. Research and monitoring projects could include Puget Sound Atlantis Modeling, zooplankton monitoring, salmon and forage fish sampling and pinniped predation work (**Recommendations 12, 15 and 16**).

Improve water quality.

Encourage the Washington State Department of Ecology to proceed with language in new rule on increasing the standard for total dissolved gas allowances in the Columbia and Snake rivers that will ensure the durability of the new rule (**Recommendation 8**).

Increase funding for education and enforcement.

Increase funding and make funding ongoing to WDFW for additional officers and equipment for enforcement (**Recommendation 20**).

Reduce noise and disturbance from U.S. Navy military exercises.

The Governor's Office and state agencies should coordinate with the National Oceanic and Atmospheric Administration and the Navy to reduce noise and disturbance from military exercises affecting Southern Resident orcas. In particular, the final decisions on training and testing activities conducted in the Northwest training and testing study area between November 2020 and November 2027 should eliminate impacts from current, new or additional exercises

involving mid-frequency sonar, explosives and other activities with the potential to adversely affect Southern Resident orca recovery, or incorporate enhanced mitigation measures to reduce impacts (**Recommendation 25**).

Fund source local control program and increase incentives to reduce stormwater threats.

Additional funding should be provided for Ecology staff to support contaminants recommendations and should include pass-through funding to support local source control inspectors (**Recommendations 30, 31 and 32**). Funding should also be provided for incentives to reduce stormwater threats (**Recommendation 31**).

Prioritize stormwater cleanup based on salmon population productivity.

It is critical that we find ways to prioritize discretionary stormwater management and cleanup based on evidence of toxic impacts limiting salmon population productivity. Current state-level stormwater funding could be better targeted to priority areas. Programs currently do not seek highest-priority projects (**Recommendation 31**).

Prioritize contaminants of emerging concern and update aquatic life water quality standards.

The state should support ongoing prioritization work that addresses contaminants of emerging concern. Ecology should update aquatic life water quality standards focused on pollutants most harmful to Southern Resident orcas and their prey (**Recommendations 30 and 32**).

Provide funding to evaluate the effectiveness of task force recommendations.

Provide funding to PSP, WDFW, the Governor's Salmon Recovery Office and Ecology to evaluate the effectiveness of task force recommendations through monitoring and adaptive management while leveraging existing efforts (**Recommendation 35**).

Additional components of Year One recommendations:

Increase habitat protection.

Reduce the impacts from development on critical habitat and sensitive ecosystems that Southern Residents and the food web rely upon. Revise statutes to shift from a "no net loss" standard to a "net ecological gain" standard to better protect salmon and orcas. Provide adequate funding and support to state natural resource agencies and local governments to improve planning, permitting and enforcement activities that protect habitat, while funding restoration efforts (**Recommendations 3, 4 and 48**).

Prevent northern pike expansion into the Columbia River.

Increase funding to WDFW for northern pike eradication and containment efforts to prevent predation on salmon in the Columbia River (**Recommendation 14**).

Increase funding for education and enforcement.

Provide resources to WDFW and other groups to (1) expand boater education and enforcement to central Puget Sound in the fall, (2) seek vessel mitigation opportunities and (3) extend outreach to promote compliance by vessel operators in newly proposed critical habitat on the outer coast of Washington (**Recommendation 19**).

Create a transboundary forum.

Create and charter a transboundary forum for waterways management and Southern Resident conservation by working with the appropriate federal partners, tribes and agencies to integrate and coordinate state, federal and Canadian actions. Evaluate cumulative impacts of vessel traffic (**Recommendations 22, 24 and 27**).

Actively promote compliance with Canada's foraging sanctuary zones.

Actively promote compliance by the United States shipping sector and recreational vessels with Canada's interim and potential future foraging sanctuary zones such as Swiftsure Bank and Pender Island (**Recommendation 22**).

Ensure the State Environmental Policy Act review of marine facilities.

Help ensure that the State Environmental Policy Act review of marine facilities is routinely applied to standard and atypical changes in use and ownership that may lead to increased vessel traffic or changes in vessel traffic dynamics. Provide tools for local and state governments to identify and evaluate potential impacts and recommend potentially appropriate mitigation measures (**Recommendation 27**).

Maintain Model Toxics Control Act funding.

Toxics control funding provided though the state's MTCA should be maintained for preventing and cleaning up toxics (**additional component of Recommendation 31**).

Increase funding for infrastructure improvements.

Increase funding to specific accounts that support infrastructure improvements, including the Clean Water Pollution State Revolving Fund, Stormwater Financial Assistance Program and Public Works Trust Fund. Increase caps on utility fees to help fund improved treatment of wastewater, stormwater and other contaminant sources (**Recommendation 31**).

Increase monitoring and associated funding.

Weave monitoring into each recommendation and dedicate funding to Ecology, PSP and WDFW to provide data on effectiveness (**Recommendation 33**).

Transition one-time investments in orcas and salmon in 2019 into ongoing investments.

Much of the increases in funding that WDFW received as part of the Southern Resident orca package was one-time funding. To most benefit orcas, this funding should be sustainable (**Recommendation 34**).

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% 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 rulemaking.

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% to up to 125%, 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% 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%, 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 rulemaking 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 concern[7] 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.

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.

[7] 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.

Recommendation 37: Protect against regulatory rollbacks at the federal and state level.

Implementation details:

The regulations that protect Southern Residents from contaminant threats are a mixture of state and federal laws and implementation. Historically, the relationship between state and federal regulators has been characterized by cooperative federalism and delegated authority. This historical precedent is being challenged through federal regulatory rollbacks to the Clean Water Act (including water quality standards and the definition of Waters of the U.S.), Endangered Species Act and other foundational laws. Given the current federal regulatory environment, the Governor and state agencies should ensure that state authority, rules and regulatory protections are sufficient to prevent moving backwards. The state should maintain and strengthen state authority, rules and regulatory protections.

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 concern[8] and other chemicals based on greatest benefit to Southern Resident orcas and their prey. In addition, 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

[8] 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.

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.

Recommendation 38: Explore setting minimum standards for local stormwater funding to ensure that all programs have the resources necessary to protect water quality.

Implementation details:

A primary barrier to effectively managing stormwater is local government capacity to implement stormwater management programs. With too little staff capacity or limited capital funding, it is unlikely that jurisdictions will be capable of innovating, or even implementing requirements expected to be more stringent in the future. In many cases, local governments with the best, most intact natural resources often have the least capacity protect them.

Local government spending on stormwater programs varies from jurisdiction to jurisdiction, leaving some programs without adequate funding. Additionally, it can be problematic when stormwater funding is forced to compete with other “general fund” priorities. We should seek to better understand the varying funding streams, relative funding rates, and what can reasonably constitute adequate funding for different jurisdictions.

It would be beneficial for existing county and city organizations or workgroups to convene a meeting of jurisdictions in the Puget Sound region to identify what funding levels would be adequate to meet the need to control stormwater, explore funding alternatives, and discuss how to establish a “floor” for minimum investments. The Washington State Department of Commerce and Washington State Department of Ecology should participate in those discussions. With a better understanding, the state should explore legislation to set minimum standards for local stormwater funding, ensuring that all programs have the resources necessary to protect water quality.

Reduce human sources of nutrients in Puget Sound

Recommendation 39: Develop a National Pollutant Discharge Elimination System permit framework for advanced wastewater treatment in Puget Sound to reduce nutrients in wastewater discharges to Puget Sound by 2022.

Implementation details:

Discharges from wastewater treatment plants represent more than 50% of the human sources of nutrients into Puget Sound and contribute significantly to low dissolved oxygen levels. Ecology proposes developing a Puget Sound Nutrients General Permit to control nutrient discharges from domestic wastewater treatment plants (sewage treatment plants) through its National Pollutant Discharge Elimination System regulatory authority. The alternative to a general permit is to include nutrient control requirements in each wastewater treatment plant's individual permits, one by one, as they are reissued over the next five to 10 years.

Recommendation 40: Better align existing nonpoint programs with nutrient reduction activities and explore new ways to achieve the necessary nonpoint source nutrient reductions.

Implementation details:

Ecology should establish minimum requirements for nonpoint source best management practices to ensure they meet water quality standards. Existing nonpoint source programs can be expanded to address known problems related to nutrient runoff from agricultural, suburban/urban and rural land use activities. Many of these nonpoint source implementation actions have multiple benefits for water quality improvement, including nutrient reduction.

Recommendation 41: Collect high-quality nutrient data in watersheds to fill key knowledge gaps of baseline conditions.

Implementation details:

Making science-based nutrient management decisions depends on having the right tools and high-quality data. The Salish Sea Model is our best tool for understanding the marine waters of Puget Sound and evaluating the best suite of nutrient load reductions necessary to achieve water quality standards. Ecology should augment key watershed monitoring stations with continuous nutrient monitoring technology to improve our understanding of watershed nutrient loads and establish baseline conditions to measure future change.

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.

Continuing the mission of Southern Resident orca recovery

Recommendation 42: Create one or more entities with authority and funding to recover and advocate for Southern Resident orcas by implementing task force recommendations, creating new recommendations as needed and reporting to the public, governor and tribal co-managers on status.

- Any oversight group must incorporate the following elements:
  - Is co-managed by the Governor's Office and tribes.
  - Coordinates with federal agencies in both the United States and Canada to stay connected to ongoing policies around species recovery.
  - Aligns with governor's priority on diversity, equity and inclusion and environmental justice.
  - Maintains some element of the working group structure and provides ongoing support and facilitation of working groups by state agencies.
  - Continues engagement from nonprofits, businesses and other stakeholders to monitor implementation of existing recommendations, consider new recommendations and recommend course corrections for continued recovery.
  - Maintains and enhances public visibility and interest in this crisis and facilitates a robust public engagement process.
  - Builds on ongoing monitoring and reporting to maintain accountability to the public.
  - Maximizes institutional durability, at least until the population reaches 84 whales by 2028.[9]

[9] In its 2018 report, the task force set forth the goal of increasing the Southern Resident population to 84 whales by 2028, or "10 more whales in 10 years."

Implementation Details

The task force has identified three general options (not listed in priority order) for moving this recommendation forward. By selecting one of the following options, the state can better ensure that between now and 2022, we witness evidence of consistently well-nourished whales, more live births and the survival of several thriving young orcas. With adequate consistency and attention, by 2028, we could 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 finally see their population increase to 84 whales — an increase of 10 whales in 10 years. Options are summarized below:

- **Option 1: Expand existing agency capacity.** Expand the capacity and function of the Governor's Salmon Recovery Office to include orca recovery (e.g., Governor's Salmon and Orca Recovery Office). This option leverages existing agency infrastructure and is modeled after the Salmon Recovery Funding Board, with policy coordination and administration functions within the proposed Governor's Salmon and Orca Recovery Office and a policy board that includes governor-appointed members and agency heads.
- **Option 2: Create a new executive level team in Governor's Office.** Create an executive-level salmon and orca leadership team in the Governor's Office. This option includes explicit tribal co-manager engagement by the Governor's Office. This option houses the main functions of the policy leadership team within the Governor's Office and maintains an executive-level focus on recovery.
- **Option 3: Create a new orca recovery office.** Create an orca recovery office led by technical experts. This option creates a new office that is staffed to implement actions. This office can be located within the Governor's Office or within an existing agency. The key element of this option is that it is not a stakeholder-led process.

The task force also recommends incorporating PSP's recovery system into any of these options, as appropriate. PSP is well positioned to contribute to vessels recommendations, coordinate with Canadian representatives and actions, support scientific monitoring, advise on communications and track progress. Likewise, Salmon Recovery Councils on the Columbia River and Washington Coast could be useful partners.

Appendix 5 provides additional implementation details on the three options summarized above for the Governor's Office to consider. The task force has laid a foundation for Southern Resident recovery; strong governance will be necessary to build on this foundation with immediate, sustained and meaningful action.

Goal 5: Reduce the threat from climate change, including ocean acidification, to Southern Residents, the region's biodiversity, and ultimately, the well-being of Washington's people and economy

Reduce human-caused greenhouse gas emissions

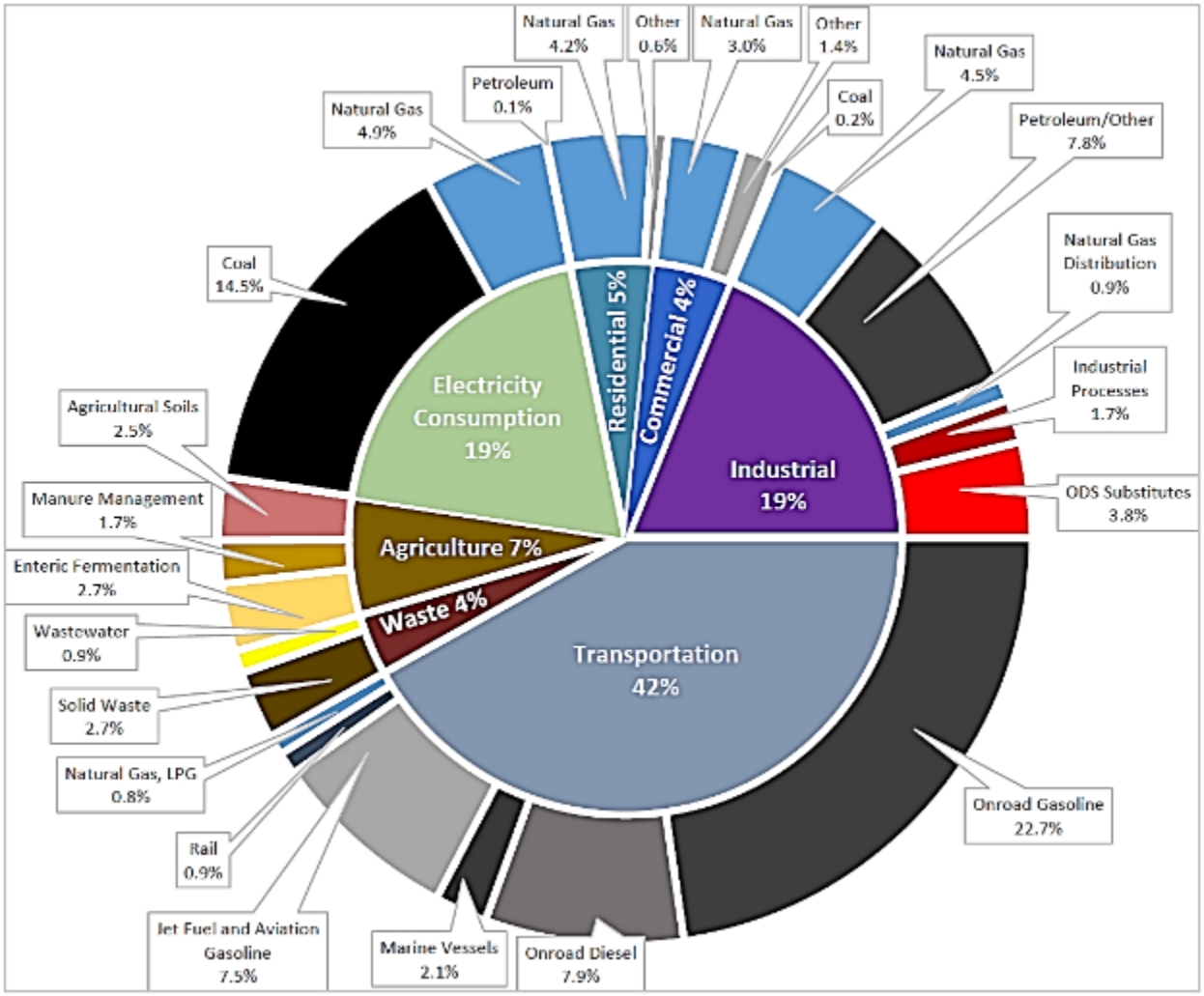
Recommendation 43: Take aggressive, comprehensive and sustained action to reduce human-caused greenhouse gas emissions, with the goal of achieving net zero emissions by 2050.

- At the individual, organizational and community levels and across the public, private and not-for-profit sectors, take immediate action to reduce greenhouse gas emissions.
- Build on existing policies and initiatives and advance policies at the state and local government levels to increase investments, regulatory frameworks and incentives that lead to a systematic and sustained reduction in emissions over the next 30 years.
- Monitor emissions reductions over time; take additional actions consistent with the goal of limiting planetary warming to 1.5-2°C.
- At the state level, provide leadership to reduce emissions in government operations and engage collectively with other states, the private sector and civil society to advance national and international solutions to reduce emissions.
- Inform and engage the public, stakeholders and decision makers on the connection between orcas, salmon, climate change and human well-being.
- Address equity issues associated with reducing human-caused emissions and transforming to a net zero carbon economy — by engaging and meeting the needs of disproportionately affected communities and workers, businesses and economic sectors that are adversely affected by the transition to low- or zero-carbon energy sources.

Implementation Details

With a focus on a vision of a thriving Southern Resident population, the task force supports immediate, aggressive and sustained action to reduce greenhouse gas emissions locally, regionally and globally. Actions can occur at all levels and be undertaken by individuals, organizations and governments across the public and private sectors and civil society. While it is beyond the task force's expertise to define specific policies and actions to reduce emissions, the science is clear that planetary warming must be stabilized at 1.5-2°C above preindustrial levels to limit the consequences of climate change [18, 42]. Most of the greenhouse gas emissions in Washington state are from transportation, electricity generation and residential, industrial, commercial and agricultural activities (**Figure 6**).

Figure 6. Washington greenhouse gas emissions, three-year average (2013–15) [43].



A sampling of actions that can be taken in Washington to reduce emissions are summarized in **Table 7** below. Although it does not endorse any specific activities or policies, the task force urges all members of the Washington community to examine their own contribution to the problem and both directly take, and advocate for, forceful action and policies to reduce emissions.

Table 7. Individual, organizational, and community action: methods for reducing carbon footprint [44, 45, 46].

Activity	Ways to reduce emissions
Transportation	• Walk, bike, bus, or use rail instead of driving • Use electric vehicles and vessels • Telecommute/teleconference • Carpool • Switch to low-carbon fuels (e.g. biodiesel)
Building heating and cooling	• Maximize use of efficient carbon-free energy (e.g., heat pumps) • Source clean, carbon-free electricity (e.g., wind, solar) • Reduce food waste • Reduce consumption of carbon-intensive food sources (e.g., meat)
Food consumption and waste	• Reduce overall consumption • Maximize reuse and recycling
Industrial	• Electrify energy sources • Maximize efficiency • Source lower carbon inputs
Agriculture and forestry	• Practice no-till agriculture and regenerative farming techniques • Improve soil health for carbon sequestration • Improve forest health to increase carbon sequestration and reduce emissions from wildland fires • Protect and restore seagrasses and other elements of coastal habitats for carbon sequestration and resilience

The Legislature — together with other local and regional governments and agencies — must continue to advance and adopt policies, investments, incentives and regulatory frameworks that can catalyze dramatic reduction in emissions generated in Washington over the next 30 years. In addition to individual actions, a policy framework and investment is needed to restructure the economy, ensure equity, address dislocations to workers and businesses and accelerate the transition to a low-carbon future. In 2018, the Washington State Legislature passed significant policies, such as SB 5116, the 100% Clean Electricity Bill, that will lead to clean energy investments and emission reductions over time. More action, however, is needed to establish policies and frameworks to: (1) reduce emissions in the transportation, building, commercial and industrial sectors, (2) encourage sequestration and emissions reduction in the agricultural and forestry sectors and in other terrestrial and coastal habitats and (3) incentivize innovations that will achieve deep de-carbonization over the longer term.

Table 8 presents an overview of alternative policy options, categorized into four broad types and linked to the major sources of emissions depicted in **Figure 6**.

Table 8. Government actions: Carbon emission reduction policy, regulatory and budget options [47].

Policy Type	Examples	Emissions & Sectors targeted
Performance standards – minimum requirements for energy efficiency, renewable energy uptake, or product performance	• Vehicle fuel economy standards • Low carbon fuel standard • Building codes for energy efficiency, fuel source, other carbon requirements • Renewable portfolio standards • Power plant emission limits	Transportation, residential and commercial, electricity
Economic signals – pricing designed to accelerate the adoption of low-carbon technologies and incorporate externalities into product costs	• Carbon fees or taxes • Cap & Trade • Subsidies, e.g. for clean energy production or efficiency upgrades	Transportation, residential and commercial, electricity, marine
Support for R&D – funding and incentives to accelerate innovation and create an enabling environment for innovation to thrive	• Funding for basic research • Shared technical expertise • Adopting intellectual property protections • Promoting STEM • Attracting STEM talent	Multiple – depending on the focus of efforts
Enabling Policies – those that enhance the functionality of the other policies	• Direct government expenditures • Information transparency • Reduction of barriers to better choices, e.g. energy use labels, good urban design providing transit options enabling a response to price signals such as a carbon tax	Multiple – depending on the focus of efforts

While broad consensus exists in Washington on the need for action to reduce emissions, each of the policy options has advantages and disadvantages in terms of efficacy, cost, equity and who is most impacted. They are supported, or opposed, to varying degrees by different constituencies, sectors and organizations. Experts have concluded that no single "silver bullet" policy will be the solution, but rather, a suite of complementary policies is necessary [47]. In this context, possible state actions include developing a comprehensive plan to achieve reductions across all major sectors of economy, prioritizing near-term actions that address the largest source of emissions (i.e., transportation) and having the Legislature create legal accountability to achieve the associated targets.

To benefit Southern Residents, actions that both reduce emissions and improve resiliency warrant priority consideration. Actions include investments in forest health, riparian and habitat restoration and agricultural practices that both sequester carbon and reduce runoff. In addition, many regulations and policies that serve to reduce emissions will also improve the health and well-being of the Salish Sea and its inhabitants including the orca, and vice versa. Education about the co-benefits of strong climate action may help build support for the policies and actions needed to address the problem at scale.

Within state and local government, actions that provide leadership in reducing emissions and have a nexus with the Southern Resident include Executive Order 18-01, which directs the WA State Ferries to move to a zero-emissions fleet. The task force endorses full and accelerated implementation of this Executive Order, while also addressing the associated noise issues that affect the orca. Other actions the state could take directly to reduce emissions include electrifying its vehicle fleets and providing support for local governments and school districts to electrify their fleets. Such leadership will help accelerate the transformation of the transportation sector from gas and diesel to electric-powered vehicles.

In addition to state and local action, Washington state should continue to work collectively with other states, the private sector and civil society to advance national and international solutions to reduce emissions to scientifically determined safe levels. State-level action is not enough. Washington state officials and leading Washington-based businesses and organizations must join together to advocate for and advance policies at the regional, national and international levels.

The successor to the task force should maintain a focus on the impact of climate change and ocean acidification on orcas and support the leadership of the governor, Legislature and state agencies to advance policies and solutions that reduce emissions. Support could include providing science-based information on the link between climate change and orca health, advocating for policy action to reduce emissions and educating the public about why reducing emissions is imperative to the survival of the orca.

Reduce, remediate, and adapt to ocean acidification

Recommendation 44: Increase Washington's ability to understand, reduce, remediate and adapt to the consequences of ocean acidification.

- Reduce local land-based contributions to ocean acidification. Reducing inputs of nutrients and organic carbon from local sources will decrease acidity in affected marine waters, decreasing the effects of ocean acidification on marine species in the area.
- Reduce Washington's carbon dioxide emissions quickly and aggressively. Reducing carbon dioxide emissions will decrease future acidification and help protect marine species (see Recommendation 3).
- Implement measures to adapt to, and remediate the impact of, ocean acidification.

- Continue to invest in Washington's ability to monitor ocean acidification and its effects. This investment will enable effective responses to ocean acidification.
- Inform, educate and engage stakeholders, decision makers and the public in addressing ocean acidification. Engagement and dialogue is essential to build support for investment in, and implementation of, effective actions.
- Maintain a sustainable and coordinated focus on ocean acidification.

Implementation Details

Washington was an early leader addressing ocean acidification and, in 2012, became the first state to develop a comprehensive plan for tackling ocean acidification through the Marine Resources Advisory Council. Since its inception, MRAC has provided a sustainable and coordinated focus on implementing the actions in the state's plan and updated it in 2017. The task force supports continued implementation of actions in the state's Ocean Acidification Action Plan and MRAC's recommended priorities, including:

- **Reducing local carbon dioxide emissions more aggressively**. Current projections indicate sharp declines in pH in Puget Sound over the next 30 years if we do not reverse course. Our local emissions contribute to local acidification and, therefore, must be part of the solutions advanced.
- **Accelerating actions that reduce human sources of nutrients**. Local human sources of nutrients are contributing significantly to ocean acidification, causing low dissolved oxygen levels and threatening marine life, particularly in parts of Puget Sound. Nutrients come from many sources, including wastewater treatment facilities, so reducing these discharges into Puget Sound is a priority. Management and policy actions that reduce nutrients from wastewater treatment plants, septic systems and other land-based sources will improve marine water quality for marine species. The Department of Ecology's Puget Sound Nutrient Reduction Project is evaluating and advancing such actions, including developing a general permit for wastewater treatment plants.
- **Improving resiliency of the ecosystem**. Protect and enhance kelp and eelgrass, which may reduce acidification locally and provide areas of refuge for marine species.
- **Continuing investments in science and collaboration** that underpin our actions and provide a sustainable and coordinated focus for our state to address and lead on this issue.
- **Updating communications materials and conducting strategic outreach** to increase understanding and connect with key audiences.

Beyond these actions at the state and local levels, Washington should continue leading, collaborating, advocating for and advancing policies at the regional, national and international levels in partnership with leading state-based businesses and organizations, elected officials and others.

Accelerate action to increase resiliency of salmon populations

Recommendation 45: Mitigate the impact of a changing climate by accelerating and increasing action to increase the resiliency and vitality of salmon populations and the ecosystems on which they depend.

- Fully implement and fund salmon recovery plans to improve climate resiliency against sea level rise, changes in precipitation, increased stream temperatures and ocean acidification. Where needed, adaptively manage and incorporate climate adaptation and resilience strategies in regional and watershed-scale recovery plans.
- Increase fish access to cold water habitats and refugia. Selectively remove, design and retrofit infrastructure (e.g., dams, culverts, dikes, rail lines, hatcheries, fish passage) to ensure long-term climate resiliency in the face of future changes in flows and water temperatures.
- Significantly increase the scale and scope of investment in habitat protection and restoration projects that focus on habitat diversity and complexity. Increase the diversity and resiliency of wild and hatchery salmon stocks.
- Ensure diverse wild and hatchery salmon populations to create more climate-resilient fish. Adaptively manage habitat restoration and hatcheries to account for and mitigate against climate change impacts such as water flow, water temperature and sea level rise. Changes may affect the location, type or operation of hatchery facilities.

Implementation details

In addition to the implementation details below, Year One Recommendations 1-9 address (1) preserving, restoring and protecting habitat, (2) expanding hatchery production, (3) re-establishing salmon runs above existing dams, (4) increasing spill over dams and (5) establishing a stakeholder process to examine the future of the Lower Snake River dams. These recommendations further the resiliency and productivity of the ecosystem and salmon populations, while providing a buffer against future adverse impacts of increased air and water temperatures, changing stream flows and sea level rise:

- Fully fund salmon recovery plans as written to ensure implementation. Increase funding as needed and look for opportunities to frontload investments to address the urgency of climate change, which exacerbates existing threats to salmon. Identify new funding sources in addition to WDFW funding. Prioritize restoration investments in (1) nearshore marine areas and estuaries, (2) floodplains and riparian areas, (3) culverts and infrastructure and (4) areas that increase access to cold water refugia. Assess which watersheds and estuaries will be most resistant to sea level rise and other impacts of climate change over time, such that they will support Chinook populations going forward. Prioritize investment in restoration and acquisition in these watersheds.

- Enhance existing efforts to increase access to cold water habitat and refugia. Identify opportunities to reintroduce species to habitats with cooler waters. Ensure that any losses in hydropower are replaced with other carbon-free sources and consider other potential conservation impacts.
- To buffer against climate change and increase stock resiliency, increase diversity and complexity of habitats throughout geographic range and restore associated life histories. While increasing stock diversity, identify resilient salmon species with sufficient populations throughout the state that have sufficient abundance and habitat diversity/complexity to adapt to climate change (also referred to as anchor populations or strongholds) — for example, unlisted species along the coast.
- Account for the impacts of sea level rise, increasing water temperatures and changes in streamflows when assessing upgrades and modifications to hatchery facilities. Consider facility water temperature and availability, river access and disease management. Hatchery managers should assess stock selection, growth rates, diversity and release timing as tools for reducing climate impacts to salmon. Ensure that these changes do not further exacerbate climate impacts on wild fish.

Pursue maritime innovations that benefit Southern Residents

Recommendation 46: Expand the Governor's Maritime Blue scope of work and provide funding to implement recommendations from the Southern Resident Orca Task Force and pursue shipping and other maritime innovations that benefit Southern Residents.

- Incentivize low-carbon or zero-emission, low-impact vessels in state waters. Target vessels with the greatest cumulative emissions impacts, based on vessel type and operational profile.
- Expand the scope of the Washington Maritime Blue initiative and the state's strategy for the "blue economy" to encompass relevant goals and recommendations from the task force. Provide additional resources as needed.

Implementation details

Vessels are a significant source of carbon dioxide emissions contributing directly to climate change and must be reduced over time to meet international and science-based goals to stabilize temperatures. The task force recommends a targeted approach to emissions reduction focused on reducing emissions from the vessels spending the most time and making the highest number of trips in local waters. As it applies to whale-watching vessels, one option to implement this recommendation could be to prioritize licensing for zero-emission or low-carbon vessels.

Although reducing emissions is a top priority, underwater noise and vessel disturbance is one of the three primary threats facing Southern Resident orcas. Ocean acidification extends the spatial spread of underwater noise (for frequencies up to 10kHz), making it more difficult for orcas to communicate. The task force recognizes that while some emerging vessel propeller technologies may reduce emissions, they can also increase underwater sounds at frequencies that interfere with orca communication and echolocation. Addressing this trade-off will require research, innovation and investment to develop and deploy technologies that reduce both noise and carbon emissions.

To catalyze this research and innovation, the task force recommends supporting Washington Maritime Blue, a strategic alliance for maritime innovation and sustainability. Maritime Blue is an independent, nonprofit partnership between industry, the public sector, research and training institutions and community organizations tasked with implementing Washington State's Strategy for the Blue Economy. The effort covers a number of potential strategies for innovation and sustainability in shipping that could benefit orcas (like sensor technologies, noise- and emissions-reduction efforts, propeller design and retrofits, etc.); however, in order to advance opportunities that provide mutual benefits for Washington's shipping industries and orcas, a clear governance mechanism within Maritime Blue is needed to incorporate priorities for orcas and sustain the effort over time.

To implement this recommendation, Maritime Blue should modify its governance structure (for example, by creating a dedicated board member seat or subgroup) to address Southern Resident orca issues and coordinate closely with the successor to this task force. Actions could include identifying and addressing shipping and other maritime impacts on orca prey, vessel noise and disturbance and emissions.

Mitigate increased threats from contaminants due to climate change and ocean acidification

Recommendation 47: Identify and mitigate increased threats to Southern Residents from contaminants due to climate change and ocean acidification. Prioritize actions that proactively reduce exposure where the increased impacts are expected to be most severe.

- Identify vulnerabilities of existing storm and wastewater infrastructure (stormwater management systems, CSO, WWTP, port and rail facilities) to sea level rise, flooding and other high-flow events. Retrofit or otherwise mitigate facilities at high risk.
- Identify and prioritize the timely clean-up and remediation of legacy toxics and waste sites that are likely to be exposed by sea level rise, flooding and high-flow events caused by climate change.

- Include the impacts of a changing climate and ocean acidification as criteria when developing a prioritized list of chemicals of concern for orcas.
- Address new contaminants entering marine and inland waters associated with the increase in wildland fires associated with climate change. These contaminants include PAHs (polycyclic aromatic hydrocarbons) from smoke, flame retardants and increased runoff from erosion.
- Ensure that the National Pollutant Discharge Elimination System permit processes are adaptable and responsive to climate-related impacts.
- Support the Department of Ecology's ongoing nutrients work and initiatives, recognizing the co-benefits of addressing nutrients to improve climate resiliency and mitigation efforts in Puget Sound and the Columbia Basin.
- Treat increased stream temperature resulting from climate change as a pollutant that creates potentially lethal conditions for juvenile salmon and returning adults. Mitigate the increase by expanding riparian vegetation and through other means to moderate temperatures.

Implementation details:

With runoff anticipated to increase as climate change drives increased precipitation, flooding and sea level rise, additional work is needed to address increasing levels of contaminants in the state's waters. Nutrient loadings will increase with these events and exposure to other toxics could increase as well. Increased bioavailability of toxics will accumulate up the food chain, ultimately threatening Chinook. In addition, the increased quantity and intensity of flows due to climate change are highly problematic, impacting the hydrology of basins and water systems and destroying forage fish and Chinook habitat.

In the near term, efforts to address this threat should focus on (1) identifying stormwater and wastewater infrastructure and other facilities — including legacy waste sites — most at risk and (2) taking action to mitigate those risks. Actions include prioritizing and adapting stormwater retrofits to account for the impacts of climate change, accelerating clean-up of toxics and waste sites, modifying or moving treatment facilities to withstand sea-level rise and increased flooding and increasing protection for low-lying infrastructure facilities (without hardening adjacent shorelines). Over time, responsible agencies and entities will need to monitor how increased intensity and duration of rainfall events, sea level rise and flooding, and warmer temperatures and ocean acidification affect toxics mobility and contaminants in the ecosystem, and proactively and adaptively manage to address expected future conditions.

To address PAHs and other contaminants associated with increased wildland fire, smoke and suppression, support the efforts of DNR, USFW and other agencies to identify and implement effective management and mitigation strategies. Accelerate investments and activities to improve forest health and reduce wildland fire risks currently being undertaken by DNR and USFW to

ultimately reduce the intensity and extent of large catastrophic fires and associated smoke as well as the consequent need for flame retardants.

With disease susceptibility in salmonids, and other critical species likely to increase with warmer temperatures, targeted toxics reduction strategies should remain a focus for Southern Resident recovery. Additionally, the state should work to better understand emerging toxics threats to determine how effects might be amplified and synergized with changes in climate, water temperature and chemistry.

To include climate change considerations in the NPDES permit process, increase the resiliency of wastewater treatment plants, combined sewer overflows and stormwater facilities to maintain treatability in the event of sea level rise, extreme flooding and high-flow events.

Regarding nutrient management, Ecology recommends (1) developing a NPDES permit framework for wastewater treatment in Puget Sound, (2) developing a watershed nutrient management model and decision support tool and (3) collecting high-quality nutrient data in watersheds to fill key knowledge gaps related to baseline conditions. These actions will address current threats from nutrient loadings to the health of the Puget sound ecosystem, salmon and orcas, as well as future increases that will result from climate-driven impacts.

Goal 6: Reduce the threat that population growth and development pose to the critical habitat and sensitive ecosystems that Southern Residents and their food web they rely upon

Prevent further degradation of critical habitat and sensitive ecosystems associated with human population growth and development

Recommendation 48: Adopt and implement policies, incentives and regulations for future growth and development to prevent any further degradation of critical habitat and sensitive ecosystems; enable and channel population growth in ways that result in net ecological gain; evaluate and report outcomes for all jurisdictions at the state, county, tribal and municipal level.

- Net ecological gain in this context refers to taking actions through development and land management that result in improvement to the quality and quantity of the functions of the natural environment. Key elements include:

  - Following the mitigation sequence of (1) avoiding impacts, (2) minimizing impacts and (3) offsetting any impacts that cannot be avoided. Recognizing that mitigation efforts aimed at no net loss have not achieved (and are not likely to achieve) 100% success at offsetting impacts, additional mitigation should be required.
  - Establishing and defining the environmental baseline from which we are measuring improvements.
  - Consider local site-specific and a larger watershed scale.

- Revise statutes to shift from a "no net loss" standard to a "net ecological gain" standard to better protect salmon and orcas from population growth and development. Examples of statutes related to development include:
  - RCW 36.70A - Growth Management Act
  - RCW 90.58 - Shoreline Management Act
  - RCW 77.55 - Construction Projects in State Waters
  - RCW 80.50 - Energy Facilities – Site Locations
- Provide adequate funding and support to both state natural resource agencies and local governments to engage with communities, improve guidelines, align policies and regulations and effectively enforce statutes that protect habitat, while funding restoration efforts.
- Disincentivize growth along priority marine and freshwater shorelines and in sensitive riparian and forest areas by requiring mitigation ratios greater than 1:1 while incentivizing infill and development in brown fields that would not impact critical habitats.
- Implement regulations that preclude new development if existing stormwater and wastewater infrastructure are within a percentage of their thresholds.
- Consider equity across rural and urban areas, incentivizing growth in areas that need it to support their economies while ensuring that economic development does not come at the cost of the environment.
- Increase affordable housing and reduce urban sprawl by growing "up instead of out."
- Promote "live where you work" to reduce commutes while improving public transportation infrastructure.

Implementation details:

In order to prevent further loss of critical habitat and restore what has already been lost, the task force urges Washington state and local jurisdictions to shift their growth standards from "no net loss" to "net ecological gain." The GMA should be more responsive to the needs of the ecosystem, treating habitat as critical public infrastructure and emphasizing protection over mitigation. The environmental baseline from which we are measuring improvements must be established and defined. This recommendation and the actions identified are closely linked to existing recommendations:

- Strengthen agency rules, regulations and policies. Enforce habitat protection laws and increase incentives for landowners (**Recommendations 3, 4 and 5**).
- Invest in and fully implement salmon recovery plans (**Recommendations 1 and 2**).
- Focus "Be Whale Wise" outreach around boating regulations in the Seattle area on new residents (**Recommendation 19**).
- Expand the governor's Maritime Blue scope of work to implement recommendations from the task force and pursue shipping and other maritime innovations that benefit Southern Residents **(Recommendation 46**).
- Fund local governments to conduct facilities planning through 2070 that looks at population growth through a wastewater, centralized and onsite sewage and stormwater lens to ensure increased contaminant loads do not impact salmon and orcas (**Recommendation 32**).

Minimize whale-strike risk and underwater noise from fast-ferries and water taxis

Recommendation 49: Conduct a comprehensive environmental review and take action to minimize potential whale-strike risk and underwater noise posed by the growing number and distribution of fast ferries and water taxis in Southern Resident critical habitat.

- Federal and state agencies with the appropriate jurisdiction should coordinate and conduct the comprehensive environmental review.
- Washington State Ferries should work with operators of fast ferries and water taxis to determine and implement effective actions.
- Engage Washington Maritime Blue in technology and innovation solutions.

Implementation details:

According to Puget Sound Harbor Safety Committee bi-monthly report summaries, the volume of fast ferry and water taxi traffic has risen dramatically in recent years, and the levels rank near the top of all vessel classes in Puget Sound (but are far exceeded by Washington State Ferries and tugs and barges). Based on the Puget Sound Partnership's assessment of automatic identification system information, such vessels travel over 300,000 miles (in more than 10,000 hours) annually in Puget Sound.

Since issuing its recommendations in 2018, the vessels working group and task force became aware of the development of several new fast ferry and water taxi operations in Puget Sound. Kitsap Transit and King County currently operate fast ferries, with other communities planning similar operations to the south and north. These ferries make multiple roundtrips in the morning

and afternoon, traveling at relatively high speeds in an area frequented by Southern Residents (especially in the fall).

The vessels working group expressed concerns about the elevated risk of collisions with Southern Residents as some of these vessels can travel faster than the top speed of orcas. The emergence of similar fast ferry networks elsewhere in the world (e.g., the Canary Islands and Korea) has led to more ship strikes with whales and dolphins. The International Whaling Commission has recommended several precautionary measures to mitigate related risks [41].

The task force urgently recommends working with the fast ferry and water taxi sector on potential bridge lookout policies and technological mitigations due to (1) the small size of the Southern Resident population, (2) evidence of collisions leading to the injury or death of Southern Residents and (3) the comparatively high vulnerability of calves and other young whales to this potential threat.

Appendix 2. Dashboard of progress made on Year One recommendations

Recommendation	Notes	Implementor(s)	Progress as of Nov. 2019
Goal 1: Increase Chinook abundance.			
Recommendation 1: Significantly increase investment in restoration and acquisition of habitat in areas where Chinook stocks most benefit Southern Resident orcas.			
1a Provide capital budget funding to support the existing lists of projects and Salmon Recovery Funding Board (SRFB) requests intended to improve Chinook and forage fish habitat.	Recommendation called for "fully funding" of Salmon Recovery Funding Board, Puget Sound Acquisition and Restoration (PSAR), Estuary and Salmon Restoration Program (ESRP), Fish Passage Barrier Removal, and Washington Coast Restoration and Resilience Initiative. Also called for "support" for Floodplains by Design, Puget Sound Nearshore Ecosystem Restoration Project (PSNERP), Chehalis Basin Strategy, and Yakima Basin Integrated Plan.	Legislature, state agencies	Capital funding in the final budget for habitat restoration totals $435 million including: – $75M ($25M state, $75M in federal authority) for SRFB grants – $73M for the Chehalis Basin Strategy – $49.5M for PSAR – $50.4M for Floodplain by Design – $12M ESRP – State's PSNERP match – $12.0M Coastal Restoration Grants – $40M for Columbia River Water Supply – $40M for Yakima River Water Supply – $40M for Streamflow restoration – $26M for Fish Passage Barrier Removal Board While significant progress was made this year, the task force was explicit that full funding was
1b Accelerate the implementation of currently funded Chinook restoration projects known to provide survival benefits to Southern Resident orcas.			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				needed for all of these programs. That goal was not achieved. **Washington Department of Fish and Wildlife:** ESRP appropriated $10M below Gov budget. PSNERP is advancing Duckabush project and has received some federal funding in addition to state match. SRFB recently approved some additional state SRFB funding for Duckabush to fill current status funding gap for this year. PSNERP continues to work with local communities to set up future PSNERP projects.
1c	Significantly increase funding for a minimum of 10 years for high-priority actions or projects targeted to benefit Chinook stocks.	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.	Legislature, state agencies	There was no discussion in the legislature about establishing a long-term funding plan for salmon habitat restoration
1d	Emphasize large-scale estuary restoration programs and prioritize grant making for restoration that increases Chinook recovery in the short term.	Should be evaluated and prioritized where juvenile Chinook production could be increased in the very near term. Estuaries called out include Nooksack, Skagit, Stillaguamish, Elwha, Dungeness, Snohomish, Green-Duwamish, Puyallup, Nisqually,	Washington State Recreation and Conservation Office; Washington State Department of Ecology, the Puget Sound Partnership, and WDFW	Due to the complexity and size of estuary projects, it often takes many years to plan and coordinate the restoration. Thus, the key estuary efforts are already in the queue for funding. The best way to prioritize the efforts is to increase funding per the above recommendations. **RCO**: Several RCO programs address estuary restoration including: SRFB, Pacific Coastal Salmon Recovery Fund, and PSAR.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
		Skokomish, Snohomish, Columbia, and Chehalis		**Ecology** Several of ECY's grant programs directly address this recommendation and are included in the budget as passed. **PSP** The potential for dam removal in the Middle Fork Nooksack to ultimately produce high numbers of returning spring Chinook for Southern Resident Orcas helped justify the project's case for PSAR funding. – The final capital budget funds RCO to provide grants to fund the top three PSAR large capital projects, along with 66 smaller-scale projects. – The final capital budget also Ecology to fund nine Floodplains by Design projects. – The Environmental Protection Agency is working with state partners to award National Estuary Program funding to habitat and other projects proposed in the 2018-2022 Action Agenda. – PSP led its annual trip to Washington, DC, May 14-16. For the first time, we combined this trip with the annual Salmon Days on the Hill. Over 70 leaders from Washington State, and salmon recovery leaders from 4 other western states, attended this event to encourage our delegations to increase funding for the Pacific Coastal Salmon Recovery Fund and the National Estuary Program.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				– PSP's operating budget includes funding to coordinate some updating of the Puget Sound Salmon Recovery Plan. – PSP will continue to work, in coordination with the Governor's Office and Office of Financial Management, to seek alternate sources of funding for these important projects. – PSP will continue to advocate for increased federal funding for orca recovery actions, including restoration and acquisition of habitat.
1e	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 RCO-administered programs to remove barriers (for example, culverts and small dams) where removal would provide a high benefit to Chinook.	Draft list identifying barriers to priority chinook runs should be developed by March 2019. Phase II (further assessment and next steps) due by June 2020. Middle Fork Nooksack and Pilchuck dams specifically called out for removal.	Governor's Salmon Recovery Office, WDFW, Fish Barrier Removal Board, regional salmon recovery orgs, and partners	**WDFW**: This task is currently behind the requested timeline because funding was not available until the current biennium (2019-21). WDFW received 2019-21 Biennial funding in their Fish Passage Division to compile existing information on high-priority barriers to Chinook during Phase I and to assist in the development of a strategic approach to prioritization and refinements to the list for Phase II. Refinements may include verification of the extent of Chinook distribution, identification of data gaps in the inventory of barriers to Chinook, and subsequent barrier and habitat data analysis, among others. **GSRO** is coordinating the WDFW efforts with the recovery regions and the watersheds.
1f	Create a new funding source to support the significant increases in investments in the	The Legislature should provide funding via the	Legislature	The Legislature did not discuss creating a new funding source specifically for salmon habitat restoration.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.	capital budget for removal of barriers identified.		
1g	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.	Consistent with restoration programs to date, projects on private lands will be limited to high priority habitat areas with willing sellers.	Legislature, state agencies	The Governor's 2019-21 operating budget proposal provided full funding for payment in lieu of taxes at the WDFW. The final legislative budget did not fully fund payment in lieu of taxes (PILT). HB 1662/SB 5696 which would have fully funded PILT on an ongoing basis were introduced but did not pass the legislature.
1h	The Legislature should ensure adequate funding for the operations and maintenance of lands acquired by the state for habitat protection and restoration projects.	Natural resource managers should be adequately funded for operations and maintenance of lands acquired.	Legislature, state agencies	Given funding shortfalls for many natural resource agencies (particularly WDFW) it is unclear if the agencies acquiring land through easements/incentive programs will have the staffing capacity/resources needed to steward the lands to obtain maximum conservation benefits.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
1i	Support a more robust monitoring and adaptive management system to better ascertain restoration project compliance and measurable ecological benefits.	Support for comprehensive and systematic evaluation of fish / habitat response / interactions to restoration.	Legislature, state agencies	ESRP program supports monitoring and adaptive management but receives opportunistic funding below levels needed for this recommendation.
1j	Support funding for completion of Chinook recovery plan updates for 14 of 16 remaining Puget Sound watersheds.		Legislature, state agencies	The Governor's 2019-21 operating budget provided $977,000 to PSP to update Chinook Recovery plans in Puget Sound. The enacted budget only provided $500,000 for this effort.
	Recommendation 2: Immediately fund acquisition and restoration of nearshore habitat to increase the abundance of forage fish for salmon sustenance.			
2a	Provide funding for the immediate implementation of nearshore habitat restoration projects.	Fully fund PSAR, Washington Coast Restoration Initiative, SRFB, and ESRP	Legislature, state agencies	Copied from above for grant programs focused on nearshore marine habitats: – $49.5M for PSAR – $10M ESRP – $12.0M Coastal Restoration Grants – PSNERP federal funding **Ecology**: – Based on immediate Executive Order actions, Ecology has identified criteria for existing grant programs to prioritize projects that benefit Southern Resident orcas.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				– Several of Ecology's ongoing grant programs directly address this recommendation and are included in the budget (See Rec.31)
	Recommendation 3: Apply and enforce laws that protect habitat.			
3a	WDFW, Washington Department of National Resources (DNR) and ECY must strongly apply and enforce existing habitat protection and water quality regulations. Provide WDFW, DNR and ECY with the capacity for implementation and enforcement of violations.	The number of WDFW and Ecology staff should be increased to improve implementation, compliance and civil enforcement.	Legislature, state agencies	**Ecology**: Additional staff to support enforcement of the: – Clean Water Act (Approx. 5 FTEs) – Shoreline Management Act (2 FTEs) – Instream-flow ($4.7M, FTEs and other work) – Ecology will devote one FTE to collaborate with WDFW in reviewing compliance with armoring priorities identified by the PSP. This position has been filled, effective November 2019. – Ecology will also provide one FTE for specialized geotechnical review of shoreline armoring proposals and conducting training for geotechnical consultants and local governments to ensure adequate demonstration of need when shoreline-armoring projects are approved. This position is in the recruitment process as of November 2019. **WDFW**: The Legislature did not fund the administrative compliance positions that were requested to implement the recommendation. WDFW is requesting funding for the positions in the 2020 supplemental legislative session. The Legislature did fund two new Fish and Wildlife Officer

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				positions to focus on habitat-related criminal enforcement.
3b	Direct DNR, WDFW and ECY 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.		Washington State Department of Natural Resources, WDFW, Ecology	The three agencies did not produce the report by July 2019. Ideally, this report would identify existing authorities among the agencies that (if fully enforced) would contribute to salmon recovery/restoration. This report would also help identify gaps where the agencies' authorities are constrained, resources are inadequate, or rules require clarification. **WDFW**: The Legislature did not direct or fund WDFW with capacity to develop the report.
3c	Coordinate state and local enforcement efforts.	WDFW and Ecology should work with the Attorney General's Office and local prosecutors to increase compliance with habitat protection and water quality regulations.	WDFW, Ecology	Unclear if coordination with the Attorney General's office is occurring. **WDFW**: No new action is planned because the Legislature did not direct or fund WDFW to implement this recommendation. However, the Enforcement Program recently did extensive outreach and education to local prosecutors on Fish and Wildlife related crimes.
3d	Develop and adopt rules to implement and enforce the Fishway, Flow and Screening statute.	WDFW - rules for RCW 77.57, Fishway, Flow, and Screening.	WDFW	**WDFW**: Funding was appropriated to complete this work. The department will need to develop new rules for implementation. The Fish Passage Division has been ramping up around the rulemaking process. A consultation with the Attorney General's Office is being set up to consult on the

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				process. A staff person will soon be hired to oversee this rulemaking process.
3e	Enhance penalties and WDFW's enforcement of the state Hydraulic Code and fish passage regulations.	Amend RCW 77.55.29 to give WDFW enforcement tools	Legislature, state agencies	**WDFW**: The Hydraulic Project Approval bill [HB 1579 (Bill Chapter 290, Laws of 2019)] was enacted to provide enforcement tools for the HPA. WDFW will need to develop rules to implement the new statute and increase WDFW Officer staffing for implementation. The HPA bill increased WDFW's civil enforcement authority and removed key exemptions. Increased fines are still undetermined. Governor Inslee requested WDFW to establish a $10K fine per violation via rulemaking. The agency is going through the rulemaking process to implement 2SHB1579 and anticipates that the Fish and Wildlife Commission will adopt the rule changes in March 2020.
3f	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.	WDFW and Ecology to work with Attorney General on increasing compliance.	WDFW, Ecology	Unclear if coordination with Attorney General's office is occurring. In addition, only Ecology got increased staff to increase prosecution of habitat violations. **WDFW**: The Legislature did not direct or fund WDFW with capacity to implement this recommendation. However, WDFW engages the Attorney General's Environmental Protection Unit when appropriate. In addition, the Enforcement Program recently did extensive outreach and education to local prosecutors on Fish and Wildlife related crimes.

Recommendation	Notes	Implementor(s)	Progress as of Nov. 2019
Recommendation 4: Immediately strengthen protection of Chinook and forage fish habitat through legislation that amends existing statutes, agency rule making and/or agency policy.			
4a	Strengthen legislation, agency rules, or agency internal policies, where appropriate, for ECY and WDFW to better protect Chinook and forage fish.	Meet regularly with the goal of developing a habitat protection/regulatory reform legislature packages for 2019 and subsequent legislative sessions and rulemaking.	Governor's Office, legislators, tribes, DNR, WDFW, Ecology, salmon recovery regional reps, and other partners	A lot of progress was made this year, but a part of this effort (regularly convening a group to constantly be developing priorities and identifying policy challenges to advancing salmon restoration) does not appear to be occurring yet. **Ecology:** Under current law, Ecology is completing a 15-year long effort to overhaul all local Shoreline Master Programs across the state to ensure no net loss of ecological functions, which includes stringent protections for Chinook and forage fish habitat. Ecology assumes that no new statutory authorizations will be needed to the Shoreline Management Act to meet the objectives to strengthen protection of Chinook and forage fish. **WDWF**: See 4b
4b	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	Add cumulative impacts and remove single-family exemption	Legislature, WDFW	**WDFW** is going through the rulemaking process to implement 2SHB1579. We anticipate the Fish and Wildlife Commission will adopt the rule changes in March 2020. WDFW authority was amended, but unclear if agencies plan to "develop a plan with local governments for analyzing cumulative impacts " as requested. The HPA bill was amended so that cumulative impacts did not have to be included.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	Hydraulic Project Approval authority.			**WDFW**: HB 1579 (Chapter 290, Laws of 2019), requested by the Governor was enacted and removed the single-family bulkhead exemption. The department will need to develop rules to implement the new statute and increase staffing for implementation. The first step is to amend the rules to reflect the statutory changes and then the department can file for expedited or standard rulemaking. The Legislature did not direct or fund WDFW to develop the plan around cumulative impacts with local governments. Currently, WDFW does not have statutory authority to require compensatory mitigation for cumulative impacts.
4c	Provide agencies with clear authority to prohibit or mitigate certain actions.		Governor's Office/Legislature, state agencies	**WDFW**: The Legislature did rescind RCW 77.55.141. This allows WDFW to require compensatory mitigation for the construction of single-family bulkheads.
	Recommendation 5: Develop incentives to encourage voluntary actions to protect habitat.			
5a	State agencies should identify and implement incentives for landowners to voluntarily protect shorelines and habitats to benefit salmon and Southern Resident orcas.		WDFW	The existing Shore Friendly Program is an example of an incentives program that has led to several thousands of feet of armoring removed and a program that local governments support. There may be options to codify and expand this program.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
5b	Increase funding for existing and seek to develop additional cooperative conservation programs.	Develop a 10-year funding proposal for incentives by June 2020" and funding for programs like Floodplains by Design, Shore Friendly Program, Forest Riparian Easement Program, Rivers Habitat Open Space Program, and Conservation Reserve and Enhancement Program.	Legislature, federal agencies, state agencies	Funding was decreased for several incentive programs, nor did the legislature discus funding needs/plans over a 10-year period as was requested. **Washington State Conservation Commission**: Funding for the Conservation Reserve Enhancement Program supports incentive-based riparian restoration and enhancement projects supporting Chinook riparian habitat. The 2019-21 capital budget significantly reduced available funding for this program, risking the ability to increase needed riparian habitat. WSCC will consider whether to pursue a supplemental budget request to increase support for CREP. **WDFW**: Three habitat staff are participating in the Puget Sound Task Force Multi-Agency Review Team. The purpose of the MART is to streamline the federal permitting process for soft-shore protection projects. WDFW-ESRP Shore Friendly Program was only partially funded due to below-request ESRP appropriation. EPA federal funding has provided a 1-time support for Shore Friendly for this biennium. A future funding gap exists for Shore Friendly for capital and non-capital funding at current ESRP appropriation levels.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			
6a	Authorize/provide funding for WDFW 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 Endangered Species Act (ESA). Decisions on hatchery production are made by WDFW and tribal co-managers, with ESA consultation from the NOAA and the U.S. Fish and Wildlife Service where appropriate. The Washington Fish and Wildlife Commission adopted a policy statement in 2018		Governor's Office/Legislature, WDFW	**WDFW**: – An additional $13.5 million was provided to WDFW and tribal co-managers for increasing hatchery production in Puget Sound, Washington Coast and the Columbia River. – WDFW is working with National Oceanic and Atmospheric Administration Fisheries and United States Fish and Wildlife Service on implementing new production in FY20 and FY21. – Ongoing work to implement increased production was funded in FY19. – Releases of increased production began in May/June of 2019.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			
6b	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.	Pilots should aim to (1) increase marine survival, (2) adjust return timing and locations, (3) increase size and age of returns, and (4) reduce competition with wild fish. Effectiveness would be assessed with five-year review of hatchery increases	WDFW, co-managers, NOAA, and Long Live the Kings	**WDFW**: Coordination with Puget Sound tribes and LLTK on size and age of returns and increasing smolt to adult survival. Legislative funding was provided for this action. Approximately 7.5 million additional fish were released in spring of 2019. Quarterly meetings are being held to coordinate the hatchery pilot studies. 2019 brood year production proposals for WDFW, Co-manager and Douglas Public Utility District total 26.8 million. Continuing to work with NOAA and USFWS on consultation for increased production.
6c	Manage the increase in hatchery production consistent with available and improved habitat to enable survival of both hatchery and wild fish stocks.		WDFW, co-managers	The Prey Working Group expressed that it is unclear if the increases in hatchery production are being coordinated with investment in habitat restoration or are occurring in areas where the habitat can accept/support additional fish. Without additional restoration resources this is unlikely to be successful.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
6d	Provide increased funding to cover the operational, infrastructure, management and monitoring costs associated with increased hatchery production.		Governor's Office, Legislature, WDFW	Funds for monitoring and management costs associated with increased production were not yet provided to WDFW.
6e	Conduct ongoing adaptive management, five-year comprehensive reviews and the science needed to support a sustained increase in hatchery production.	Reviews should consider stray rates, juvenile rearing carrying capacity, density dependence, smolt-to-adult ratios, genetic fitness"	WDFW, co-managers	No funding has yet been obtained for this purpose.
	**Recommendation 7**: Prepare an implementation strategy to reestablish salmon runs above existing dams, increasing prey availability for Southern Resident orcas.			
7a	Provide funding to WDFW 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		WDFW, regional salmon recovery orgs, tribes, local governments, NOAA	**WDFW**: The legislature provided $524,000 to WDFW for enhanced engagement on this issue. WDFW staff have been coordinating with the Upper Columbia United Tribes to develop a strategy to amend existing Hatchery Genetic Management Plans in the upper Columbia. The HGMPs are attached to multiple tribes, public utility districts and WDFW. Amending these permits requires extensive coordination amongst managers and the utilities and coordination and approval with NOAA. The HGMPs dictate to the fishery

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			managers the number of hatchery origin salmon and steelhead that can be released into the upper Columbia River and tributaries. Reintroduction of salmon and steelhead above Chief Joseph and Grand Coulee Dams will require a substantial increase in the number of smolts released into the upper Columbia and tributaries. The current HGMP's do not consider the impacts of these increased stocking events. With these increased stocking numbers, these HGMPs will have to be renegotiated with NOAA to ensure that programs are within the bounds of ESA impacts to existing wild salmon and steelhead populations. WDFW's Hatchery Evaluation and Assessment Team will take the lead in working with the multiple parties involved to amend these permits. WDFW and UCUT will work with NOAA over the coming 2 years to scope out the increases in smolt release programs and how these will fit into the existing HGMPs to be protective of wild salmon and steelhead while allowing the release of adequate numbers of smolts to effectively test reintroduction efforts above Chief Joseph and Grand Coulee Dams. WDFW has also been working with UCUT staff on outreach and communication to decision-makers regarding reintroduction. In August, WDFW helped staff a tour of sites relevant to reintroduction by the Northwest Power and Conservation Council's (NPCC) Independent Scientific Advisory Board (ISAB), as part of the ISAB's review of the UCUT's Phase I report to the NPCC on reintroduction. The Phase I report,

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				with which WDFW assisted UCUT, looks at habitat potential, disease risk, and stock selection issues. Once approved by the NPCC, Phase II will begin, which will be focused on using modelled and real-world testing to assess the best locations and technologies for reintroduction. WDFW recently submitted comments reinforcing the value of this phased process and encouraged the NPCC to move forward with it as it amends its Fish and Wildlife Program. Finally, WDFW staff attended one of the Colville Tribe's "cultural releases" of small numbers of trucked salmon into Lake Roosevelt in August. These releases mark the first time that the waters above Chief Joseph and Grand Coulee dams have seen salmon since the construction of those dams.
	**Recommendation 8**: Increase spill to benefit Chinook for Southern Residents by adjusting total dissolved gas allowances at the Snake and Columbia River dams.			
8a	Direct the ECY 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		Ecology	Ecology started the rule process in the summer of 2019. A draft rule was out for public review and the agency is currently reviewing all comments. A final rule is expected by the end of December 2019.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	salmonids for Southern Residents.			
8b	Coordinate with the Oregon Department of Environmental Quality to align standards across the two states.		Ecology	Ecology has stayed in constant communication and connection with our counterparts at the Department of Environmental Quality in Oregon. We are working on making sure the two standards are similar across both states.
8c	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.		Ecology	As part of the rule that Ecology proposed there is a requirement for biological monitoring to track spill impacts on aquatic species.
8d	Work with tribes, salmon recovery regions, ECY and WDFW to minimize revenue losses and impacts to other fish and wildlife program funds.		WDFW, NPCC	NPCC is amending its current Fish and Wildlife Program through the use of an addendum. Comments period closed on Oct 18, 2019. Washington state is working on a long-term funding agreement for fish and wildlife programs with Bonneville Power Administration.
	**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.			
9a	In conjunction with the states of Idaho and Oregon, Washington should act quickly to hire a neutral third party		Governor's Office	$750,000 ($375,000 per fiscal year) was appropriated in the 2019-21 biennial operating budget to the Governor's office for a neutral third-party contractor.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			A consultant was hired in July 2019. Interviews with stakeholders, tribes and impacted states are underway. Draft report is to be released in December 2019. Public meetings are to be held in Vancouver, Clarkston and Tri-Cities in early January 2020. The report is scheduled to be completed by early March 2020.
	**Recommendation 10**: Support full implementation and funding of the 2019–28 Pacific Salmon Treaty.			
10a	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.		Governor's Office, WDFW	This work is ongoing. While several Prey Work Group members expressed disappointment that the orcas are not considered a 'user group' in the treaty negotiations, that was not indicated in the task force recommendation. The recommendation was solely to express support for implementation of Pacific Salmon Treaty. **Pacific Salmon Commission**: – Met with Congressional staff and federal agency representatives in Washington, D.C., November 2018. Received a generally positive response accompanied by a request for supplementary information. – A summary document for each component of one-time and annual funding request was developed and shared in conjunction with 26 follow-up visits in Washington D.C. that included west coast congressional members and/or their staff, key staff associated with
10b	The treaty and its appropriations will result in harvest reductions, reduced bycatch, increased hatchery production and investments in habitat restoration,			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	which are crucial to reducing harvest thereby increasing Chinook for the benefit of Southern Resident orcas.			appropriations, and NOAA DC staff in March 2019. – Several letters of support have been sent to key congressional members including one from Phil Anderson that included 25 individuals or organizations signing on in support, one from the PSP, and one from the WFWC. **WDFW**: – Congress is continuing work on FFY 20 appropriations. – Senate committee reports and House appropriations are encouraging but less than the full request. – Senate includes an additional $23.7M; House an additional $30M. – US section is now preparing to seek remainder of funding request in FFY 21.
	Recommendation 11: Reduce Chinook bycatch in west coast commercial fisheries.			
11a	WDFW 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.	Via Pacific Fishery Management Council and North Pacific Fishery Management Council (NPFMC)	WDFW	**WDFW**: Ongoing efforts to avoid and minimize Chinook bycatch through the Pacific and NPFMC. National Marine Fisheries Service West Coast Region has informed the Pacific Fishery Management Council that they are reinitiating consultation under the ESA for 2019 ocean salmon fisheries. PFMC will work with NMFS through the re-consultation and Biological Opinion process.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				The NPFMC meets five times annually and is updated on current levels of chinook bycatch at each meeting. The NPFMC receives annual updates from Groundfish industry on their efforts to minimize chinook bycatch. The PFMC also meets five times annually, and chinook bycatch is monitored year-round. All catch, including bycatch, is tracked and provided as an in-season report at each meeting. NMFS also provides an annual report on all catch, including chinook salmon bycatch, in the groundfish fisheries every March. WDFW will continue to work within the councils to seek further reductions when and where possible, as new technology and research becomes available.
	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.			
12a	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		WDFW, NOAA, Tribes	**WDFW**: – The Governor requested $1.2 million in the 2019-21 operating budget to conduct research on the impact of pinnipeds in Puget Sound. WDFW did not receive funding for this work from the legislature in 2019. – WDFW coordinated with Canada and our partners on a science workshop in May 2019 at the University of British Columbia to work towards a shared understanding of the latest

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	reducing Chinook smolt predation.			information available among scientists closest to the topic. – WDFW and tribal co-managers are working to complete processing and analysis of harbor seal and sea lion diet in Puget Sound from 2017 and 2018 within existing resources as possible. – WDFW and several tribal co-managers collaborated to conduct pinniped surveys of the Salish Sea in August 2019. The surveys were done in coordination with Canada to allow for a cross-border assessment of pinniped populations. – WDFW and tribal co-managers are meeting in early November 2019 to further discuss the state of the science around pinnipeds and salmonid predation. WDFW and Fisheries and Oceans Canada, with tribes, first nations, and other partners are conducting additional transboundary workshop on pinnipeds in late November 2019. – WDFW is requesting additional funding in the supplemental 2020 legislative session to further the work outlined in the recommendation. **PSP (12d):** Convening of a management panel should wait until the science work group has compiled its comprehensive report. In the meantime, the Partnership worked with the Northwest Indian Fisheries Commission to host a panel discussion
12b	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.		Gov, Legislature, and NOAA	

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
12c	Engage NOAA to determine the optimal sustainable populations of harbor seal stocks in Puget Sound.		WDFW, NOAA, Tribes	on pinniped management options with Congressman Derek Kilmer on October 8, 2019.
12d	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.		PSP, NOAA	
12e	Provide funding for the science, research, coordination, decision making and, if deemed necessary, removal.		Gov, Leg	

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	Recommendation 13: Support authorization and other actions to more effectively manage pinniped predation of salmon in the Columbia River.			
13a	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.		Governor's Office, WDFW	**WDFW**: – In December 2018, President Trump signed into law S. 3119 – the Endangered Salmon Predation Prevention Act – which gives state and tribal resource managers more flexibility to manage sea lion predation in the Columbia River. – S. 3119 allows NMFS to approve permits for Washington, Oregon, Idaho, and several area tribes that will streamline the removal process of a designated number of sea lions from a portion of the Columbia River and adjacent tributaries each year.
13b	Support Marine Mammal Protection Act (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.		Governor's Office, WDFW	**WDFW**: The states and eligible treaty tribes have initiated the process to obtain a joint permit for removal of California and Steller sea lions in the Columbia River's mainstem between River Mile 112 and the McNary Dam, and Washington tributaries. WDFW, Idaho Fish and Game, Oregon Department of Fish and Wildlife, and Columbia River Inter-tribal Fish Commission submitted an application in May 2019 under the new MMPA Section 120(f) to increase removals of Steller and California sea lions in the Columbia River and tributaries. NMFS has determined that the co-managers' application was sufficient and is accepting public comment on the application through the end of October 2019. WDFW has nominated a staff person to represent agency on

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				the pinniped task force. WDFW submitted a 2020 supplemental operating budget request for $924K in September to the Governor's Office for consideration in the 2020 legislative session.
13c	Monitor Chinook survival and pinniped distribution in the Columbia River estuary to guide current and future management actions.		WDFW	Some Prey Working Group members expressed that they were unclear if monitoring protocols are in place to assess the impact of lethally removing pinnipeds and if this action contributes to salmon recovery (and if it is an efficient use of limited resources). **WDFW**: WDFW did not receive additional funding for this work from the legislature in 2019.
13d	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.		WDFW	Some Prey Working Group members expressed that it was unclear if this is being explored, which is unfortunate because it is an important non-lethal piece of this recommendation. **WDFW**: WDFW did not receive additional funding for this work from the legislature in 2019.
	Recommendation 14: Reduce populations of nonnative predatory fish species that prey upon or compete with Chinook.			
14a	Adjust game fish regulations and remove catch and size limits on		WDFW	**WDFW**:

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	nonnative predatory fish — including, but not limited to, walleye, bass and channel catfish — to encourage removal of these predatory fish, where appropriate.			2SHB 1579 (Chapter 290, Laws of 2019) included direction to liberalize bag limits for non-native predatory fish in all anadromous waters of the state (i.e., consider expanding rules that currently apply to the Columbia River to other anadromous systems, as appropriate). WDFW is conducting rulemaking to implement section 2 of 2SHB 1579. Section 2 states "The commission shall adopt rules to liberalize bag limits for bass, walleye, and channel catfish in all anadromous waters of the state in order to reduce the predation risk to salmon smolts." Department staff held five public meeting throughout the state and collected public comment via an online commenting tool through October 17th. Staff presented the proposed rule changes to the WFWC on October 19th and the Commission held a public hearing on that date. Department staff will be analyzing the public comment received and will be providing options for WFWC decision making at the December 2019 meeting. Any rule changes will take effect 31 days after filing with the Office of the Code Reviser. Some of the funding is also being used in Eastern Washington to fill some short-term needs around northern pike removal. Removal efforts will begin in February of 2020. WDFW will be hiring a crew of temporary technicians and using gill nets for removal efforts for three months to reduce the overall abundance of northern pike in Lake Roosevelt. The intent is to prevent Northern Pike from progressing further

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				downriver into the anadromous portions of the Columbia River.
14b	Evaluate predatory fish reduction options in McNary reservoir as the basis for further action to protect juvenile salmon.	Gov's budget should include "funding for the next three years" to support student of reservoir elevation management at McNary Dam	WDFW	**WDFW:** Continuing McNary assessment to determine solutions- to look at bass and walleye reduction through reservoir management
	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.			
15a	Complete Puget Sound-wide surveys of herring, smelt, and sand lance to map spawning habitat and determine abundance of these food sources for Chinook.		DNR, WDFW	**WDFW**: WDFW received funding in the biennial budget ($743K) to support this Recommendation. A new forage fish Washington Conservation Corps crew (funded by DNR) has been recruited, and they will be trained for and begin smelt and sand lance habitat surveys and mapping in October. Herring surveys will resume in January 2020. Habitat surveys will provide updates of spawning distribution and timing for all 3 species, and spawning biomass estimates for herring.
15b	Surveys should be conducted in conjunction with restoration and protection of forage fish spawning habitat.		DNR, WDFW	Unclear if sampling will be done in conjunction with habitat restoration efforts. This should be a priority as it will help agencies assess the impact of these restoration projects on target species of forage fish.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				WDFW: WDFW has met with North West Straits Initiative staff and County Marine Resource Committee volunteers who are involved in shoreline restoration projects. We have identified restoration projects that these groups will be monitoring, and WDFW and the forage fish Washington Conservation Corps crew (funded by DNR) will be assisting these groups by analyzing and providing quality control and quality assurance review of the beach spawning forage fish samples collected at these project sites.
15c	Inventory existing and planned forage fish harvest levels to determine potential impact of forage fish harvest on Chinook.		WDFW	**WDFW**: 2SHB 1579 (Chapter 290, Laws of 2019) includes a license requirement for smelt fishing in marine waters. WDFW has developed outreach materials to inform anglers of the new license requirement for smelt. We've learned that genetic analysis needed to assess the stock structure of herring encountered in the commercial fishery will not be completed in time for use in this project. We are proceeding with studies to assess smelt and herring harvest in areas where high fishing effort is reported. WDFW has begun staff recruitment and training, as well as gear testing and exploratory surveys in preparation for studies of surf smelt and herring fisheries. Surveys are planned to begin in 2020. These first phase studies will assess exploitation of herring and smelt in areas where fishing efforts are currently concentrated.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
15d	Provide funding to conduct these surveys and inventories.		Governor's Office, Leg, WDFW	**WDFW**: WDFW received funding in the biennial budget ($743K) to support this recommendation. Funding for this was received, but unclear if it's adequate for long-term monitoring. In addition to $743K, WDFW is leveraging WDFW, DNR, and Federal resources to address this recommendation. Funding beyond the current biennium will be required to continue progress.
	Recommendation 16: Support the Puget Sound zooplankton sampling program as a Chinook and forage fish management tool.			
16a	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.		DNR, WDFW	**DNR:** DNR received funding in the biennial budget and $500K was moved to DFW to support zooplankton monitoring (original request was $720k). **WDFW**: The Zooplankton Monitoring Program Steering Committee had its first meeting to discuss priorities. There is strong support for the program from the sampling partners, and all indicated that they would endeavor to continue sampling despite the budget shortfall, however, some groups indicated that they would not be able to afford to sample as frequently or as many areas as they had previously. The Steering Committee identified minimizing data gaps and maintaining sampling capacity near 2018 levels as a top priority. Sampling has continued while WDFW is working with DNR, University of Washington and the sampling partners to finalize contracts.

Recommendation	Notes	Implementor(s)	Progress as of Nov. 2019
Goal 2: Decrease disturbance of and risk to Southern Resident orcas from vessels and noise, and increase their access to prey.			
	**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.		
17a	Enact legislation in 2019 creating a half-mile "go-slow" zone, defined as speeds of seven knots over ground or less.	WDFW	**WDFW:** SSB 5577 (Chapter 291, Laws of 2019), which includes this action, was passed by the legislature and then signed by Governor Inslee. Funding of $1.36 M was provided to WDFW to implement the new laws. As a result of increased funding to WDFW Enforcement, the following results were achieved: 1.) Three FTE's were funded and staffed by new or existing Enforcement Officers in the North Puget Sound area. One additional FTE will be funded in January 2020. 2.) At least 105 SRKW patrols were conducted. (Number is lower than projected due to a protracted absence of SRKW's in U.S. waters during the 2019 season) 3.) The associated costs of vessel maintenance and operations are funded through state and federal SRKW appropriations. WDFW, along with our partners in Be Whale Wise and others have ramped up outreach and education around the new regulations.
17b	Provide for discretion in enforcement and public outreach and education as needed.		
17c	Encourage coordination among Washington state, federal and Canadian authorities to align regulations.		

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			
18a	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.		WDFW	**WDFW:** SSB 5577 (Chapter 291, Laws of 2019), which includes this action, was passed by the legislature and then signed by Governor Inslee on 5/8/2019. Funding was provided to WDFW to implement the new laws. WDFW must adopt rules for the commercial whale watching license system by January 1, 2021--based on best available science. WDFW hired a staff person to manage the rulemaking process directed via SSB 5577. An application/nomination period for members of an advisory committee closed on 10/25/19. The advisory committee will meet through spring 2020 to initiate development of the commercial whale watching licensing program. A co-manager/partner group will meet in parallel to discuss implementation details, and an independent science panel will examine the body of research to produce a summary of agreed-upon best available science. Proposed rules will be reviewed in fall 2020 for prospective adoption by January 1, 2021.
18b	WDFW should develop the permit system in consultation with the Pacific Whale Watch Association, orca conservation organizations and other stakeholders.			
18c	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			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			
18d	Consider implementing a buy-back program.			
18e	Require the use of the Automatic Identification System to enable effective monitoring and compliance.			
18f	Coordinate with Canadian authorities to			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	develop and implement the permit system across boundaries.			
18g	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").			
	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.			
19a	Create a $10 statewide Orca Protection endorsement with an opt-out option for all registered recreational vessels.		Washington State Parks and Recreation Commission	Not included in Governors policy or budget priorities for legislative session. In 2019, vessels working group and task force urged shift in emphasis to: – Close the education loophole for visiting (charter and rental users) and Canadian boaters who are not required to get a Boating Education card because they are here less than 90 days. – Make more use of Be Whale Wise platform and mass media tools (like videos that kayak companies use).
19b	Provide education on Be Whale Wise guidelines, voluntary and regulatory measures and other information at the time the marine			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	endorsement is purchased, so every boater has this basic information.			**State Parks:** State Parks is updating marine law enforcement training manuals to reflect new laws. State Parks IT worked with Washington State Patrol to code new laws for citations for ticketing and collect data. Recreational Boater Safety questions around the new laws have been created and are in the queue to be added to the online Mandatory Boater Education Card exam. State Parks' Communications Consultant is engaging with WDFW to reproduce the Be Whale Wise stickers and handouts reflecting new laws.
19c	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. Make more use of Be Whale Wise platform and mass media tools (like videos that kayak companies use).			
19d	Work with trade associations and ports and through existing government programs and channels to provide additional education to commercial and recreational boaters.			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	Recommendation 20: Increase enforcement capacity and fully enforce regulations on small vessels to provide protection to Southern Residents.			
20a	Create a WDFW Marine Enforcement Division with four additional officer positions at WDFW focused on protection and enforcement in Puget Sound.		WDFW	Funding for SSB 5577 (Chapter 291, Laws of 2019) was provided to WDFW to implement the new laws and will result in increased officer presence/number of patrols. As a result of increased funding to WDFW Enforcement, the following results were achieved: 1.) Three FTE's were funded and staffed by new or existing Enforcement Officers in the North Puget Sound area. One additional FTE will be funded in January 2020. 2.) At least 105 SRKW patrols were conducted. (Number is lower than projected due to a protracted absence of SRKW's in U.S. waters during the 2019 season) 3.) The associated costs of vessel maintenance and operations are funded through state and federal SRKW appropriations.
	Recommendation 21: Discourage the use of echo sounders and underwater transducers within one kilometer of orcas.			
21a	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	– Continue coordination with Canada – Keep message simple – Consider “Notice to Mariners” from USCG – Blend the messaging: balance need for safety while discouraging use	PSP	– Puget Sound Harbor Safety Committee adopted a voluntary Standard of Care for Puget Sound in June. Canada adopted a similar interim voluntary standard in their waters in June. – PSP, WDFW and Transport Canada are working with Be Whale Wise to help unify standard in US and Canadian waters and

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	provide exceptions for safe navigation.	– Future evaluation could explore strategies for discouraging use of other transducer types like "chirp" units that emit pulses over a broader frequency range. – Working Group strongly encouraged near-immediate development and implementation of a communications campaign/roll out – to maximize potential effectiveness in 2019 season.		disseminate consistent, simple communications materials.
21b	Conduct education and outreach.			
21c	Consider phasing in mandatory equipment requirements and regulations.			
	Recommendation 22: Implement shipping noise-reduction initiatives and monitoring programs, coordinating with Canadian and U.S. authorities.			
22a	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.	– Group has met three times – appetite for coordination – early in process so too early to tell – Important to look at emerging technologies and provide funding to support this	Northwest Seaport Alliance, Port of Seattle, Port of Tacoma, PSP	The Ports of Seattle and Tacoma, as well as the Northwest Seaport Alliance (with support WSF, NOAA, ECHO and PSP) convened a stakeholder and tribal meeting with more than 50 participants in October 2019. PSP, Port of Seattle, Port of Tacoma and the Northwest Seaport Alliance plan to lead the next phase of the Planning Committee and coordinate potential future development of a pilot program starting with dialogue at a Partnership/Tribal Co-Management Council meeting in December. The pending USCG Authorization Act in Congress could

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
22b	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.	– Quiet Seas award program – Data gaps that need to be filled – acoustic monitoring; speed by ship type; mix of ships and profiling them by sector and by vessel – coordination needed b/c this is ECHOs work – Need to find problem statement – categorizing waterway is a good first step – Assumes that we know what initiatives are – need to fill gaps – Needs tribal engagement – invites are out – Measure noise levels in habitat of orcas – need to measure the source levels of a particular vessel versus the received level at particular locations – Need coordination with Navy – Which vessel types is this going to apply to? Important to think about this. Mix of		promote and potentially expand Federal involvement.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
		traffic is important to think about. Application of any initiative can have different impacts based on type of traffic. – Need to include navigational strategies and best practices for when SRKW are present – ECHO includes this. – Are decreased noise levels helpful to SRKW – we need to know this. – Work Group wants report-outs about how it is going.		
	**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.			
23a	Conduct a ferry fleet noise baseline study as the basis for establishing noise reduction goals and developing plans.	– Funding received doesn't include shoreside infrastructure to support this, don't have funding for shoreside charges – Technology still needs to be developed	Washington State Ferries	**WSF:** Legislature funded a new electric hybrid ferry and retrofit of an existing ferry to an electric hybrid. Legislature also provided funding for WSF's fleetwide noise baseline study, which will have its fieldwork complete by the time of this final report (including testing of a Kitsap Transit fast ferry) and will have the study complete most likely by the end of the year. The Whale Report Alert System developed in Canada has
23b	Based on the results of the baseline study, institute engineered or			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	operational strategies to safely reduce noise from ferries when Southern Residents are present.	around the charging mechanism – Emissions reduction effort – great- but may not be a noise reduction effort – don't have data that cavitation is main source from ferry side – this is coupled with study to determine impact of cavitation – Noise Control Engineering under contract and will start this study starting July – all noise emanating from ferries is focus of study – Funding for one vessel retrofit and one new vessel (language says up to two) – Potential opportunity to collaborate around study – Want more funding to support long-range plan – the funding is drop in bucket – acceleration element important – Will learn something from first one and then will apply to others		expanded and is being used in Puget Sound by WSF and other maritime operators.
23c	Provide capital funding to accelerate the transition to quieter and more fuel-efficient ferry fleet.			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
		– Whale Report Alert System needs to be implemented beyond the ferry system – Work Group would like to get updates but do not need to roll up sleeves.		
	Recommendation 24: Reduce the threat of oil spills in Puget Sound to the survival of Southern Residents.			
24a	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.	– Not all elements from original bill made it into law – (1) ECY rulemaking for emergency response towing vessels – additional legislation would be needed to authorize them to conduct rulemaking – this still important piece – A lot more to do outside of ESHB 1578 around oil spills recognizing that ESHB 1578 is important piece of legislation – Potential additional noise – needs to be direction/funding to	Washington Board of Pilotage Commissioners, Ecology	**Ecology:** In March 2018, the governor signed Exec. Order 18-02 directing state agencies to take several immediate actions to benefit SRKWs. Ecology was directed to create a curriculum to improve and increase the number of trainings for vessels in the whale watching industry to assist in the event of an oil spill. Ecology requires funding to implement the Curriculum Plan for a Killer Whale Deterrence Program Report published in April 2018. – Ecology will work with WDFW to develop and deploy a whale deterrence program within the waters of the Salish Sea, Strait of Juan de Fuca, and Puget Sound. – Ecology will assist the Board of Pilotage Commissioners with adopting rules for tug requirements for oil tankers and safety measures when dealing with oil tankers in Washington waters (similar to the approach in 2SHB 1611 in the 2017 session).
24b	Enact legislation disallowing any shoreline or seafloor infrastructure that would support offshore oil and gas development off the Washington coast.			
24c	Update oil spill prevention and cleanup standards to address new types of oil and			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	increased use of articulated tug-barges.	help monitor this change/impacts – before and after before rule goes into place.		– Standards for articulated tug barges will be covered under the Rules for Tug Escorts item also noted under this recommendation. – ESHB 1578 (Chapter 289, Laws of 2019), passed by the 2019 Legislature and signed by Governor Inslee, requires smaller oil vessels that can carry up to 7 million gallons of oil to have tug escorts in the busy shipping lanes of Rosario Strait and waters to the east by Sept. 1, 2020. The new law brings the smaller oil vessels in line with the long-standing escort requirements for the large, loaded oil tankers traversing the Salish Sea. (recruiting for risk modeling team) (identifying zones then modeling) (shipping synopsis) (Host Salish Sea Forums) – 5-year effort. Agency is funded for the 2019-21 biennium at $1.37 M for implementation. – Per ESHB 1578 (Chapter 289, Laws of 2019), the Board of Pilotage Commissioners will initiate rulemaking in December 2019 to work with us to adopt rules for tug escorts in all of Puget Sound for the smaller oil vessels by 2025. It requires us to work with the U.S. Coast Guard, tribes, and stakeholders to develop and maintain an internal computer modeling capability that uses data to predict vessel risk to inform the rulemaking. – Ecology must assess by September 2023 if an emergency response towing vessel stationed in the San Juan Islands — similar to the emergency response towing vessel currently stationed at Neah Bay — would reduce oil spill risks. This will be a topic of discussion at the 2019 Salish Sea Shared
24d	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.			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
				Waters Forum to be held Nov. 14, 2019, in Bellingham.
	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.			
25a	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.	• Interest in maintaining and restoring institutional knowledge within the Navy on this topic • For detailed information and to comment on proposed future Navy testing and training activities in the northwest, use the portal provided in the Draft Supplemental EIS/OEIS • The spatial scale and effectiveness of current SRKW deterrence strategies in the event of an spill in the Northwest Area Contingency plan are limited; there was broad interest in exploring the unconventional idea of whether/how deployment of Navy mid frequency sonar during an oil spill response could be applied, among other alternatives. • Vessels Work Group involvement likely needed as part of follow up to the	PSP	The US Navy joined the vessels working group in 2019 and at least five experts participated. The Navy also participated in the ECHO South meeting in September 2019 (Recommendation 22). The Navy met with WRAS in September to discuss potential use of Whale Report Alert System. Many organizations from the Task Force submitted public comment on the Navy's Draft Supplemental EIS/OEIS in June 2019. NMFS has proposed expanding SRKW critical habitat beyond Puget Sound to the outer coast of Washington. The comment deadline is in mid-December 2019. The State of Washington and other organizations plan to submit comments and note concerns with the geographic exemption for military activities off the north coast which overlaps with the distribution of the Southern Resident orcas.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
		updated SRKW hazing plan outlined in the Governor's Executive Order in 2018.		
	**Recommendation 26**: Revise chapter 77.15.740 RCW to increase the buffer to 400 yards behind the orcas.			
26a	The guidelines of the Pacific Whale Watch Association include this voluntary standard.		WDFW	SSB 5577 (Chapter 291, Laws of 2019), which includes this action, was passed by the legislature and then signed by Governor Inslee. Funding was provided to WDFW to implement the new laws. **WDFW:** As a result of increased funding to WDFW Enforcement, the following results were achieved: 1.) Three FTE's were funded and staffed by new or existing Enforcement Officers in the North Puget Sound area. One additional FTE will be funded in January 2020. 2.) At least 105 SRKW patrols were conducted. (Number is lower than projected due to a protracted absence of SRKW's in U.S. waters during the 2019 season) 3.) The associated costs of vessel maintenance and operations are funded through state and federal SRKW appropriations. WDFW, along with our partners in Be Whale Wise and others have ramped up outreach and education around the new regulations.
26b	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.			
26c	Encourage coordination among Washington state, federal and Canadian authorities to align regulations, which will foster clear communication and increase compliance.			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			
27a	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.	– Need more direction from Governor's Office – agencies are waiting for Governor's Office for Regulatory Innovation and Assistance to schedule a meeting- needs to be agency meetings to figure out what to do together. – No discussions between permitting world at state level – Loophole is new use to existing facilities – Loophole – high-speed ferries (what regulations are they working under – do they have to abide by same laws/regulations as other operators, ferries, etc.)	DNR, Ecology	As requested by ORIA, members of the Vessels Working Group developed clearer statement of the key two problems this recommendation sought to address. Accordingly, the next steps are: (1) for the next phase of the Vessels Working Group to develop additional technical resources that can be consulted by coastal planners and environmental staff to identify and suggest mitigation options for potential impacts of increased vessel traffic and associated with facilities; and (2) for Ecology to update the State Environmental Protection Act checklist to include a vessel traffic question and specifically require that potential impacts to SRKW be addressed. Because this by itself does not seem to warrant legislative attention, Ecology is inclined to make such modifications to the SEPA checklist whenever they next conduct rulemaking on SEPA for other purposes (i.e., rather than as a standalone effort). Before potentially updating the state JARPA (Joint Aquatic Resources Permit Application), the willingness and timeline for DNR, WDFW and Ecology to provide expertise on interpreting data and impacts must be determined.
27b	Coordinate with local governments and tribes and increase transboundary coordination with Canada.			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	Recommendation 28: Suspend viewing of Southern Resident orcas.			
28a	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 rulemaking to define Washington whale watching in coordination with the commercial whale watching industry, kayak industry, local governments and interested nongovernment organizations.			This component was removed from the Governor's request legislation. – Task Force and Working Group viewpoints strongly split on this recommendation – If a suspension were to be required, there would need to be much greater funding and capacity provided for enforcement to be effective – In contrast to Washington, commercial whale watchers in Canada agreed to not watch the Southern Resident orcas for the upcoming year – A new ballot initiative in San Juan County seeks to restrict vessels from watching the Southern Resident orcas within 650 yards in San Juan County waters; an oppositional lawsuit from commercial operators has been filed against the proponent and the County. – San Juan County is advancing a marine spatial planning process which will more definitively identify the Southern Resident orcas foraging hotspots and patterns in commercial and recreational fishing use.
28b	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.

Recommendation	Notes	Implementor(s)	Progress as of Nov. 2019
	Recommendation 29: Accelerate the implementation of the ban on polychlorinated biphenyls in state purchased products and make information available online for other purchasers.		
29a	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.	DES does not currently have authority to require disclosure, but should create strong disclosure incentives, and/or work to make low or no PCB purchasing decisions the norm.	Governor's Office, DES	**DES:** DES published the Purchasing Preference Policy, provided a training for DES contracting staff, and is currently adding new language to master contracts as the old versions expire and the new 6-10-year contract is developed.
29b	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.	Scope and assess resource needs to develop legislative request.	DES	DES has completed guidance for state agencies.
	Recommendation 30: Identify, prioritize and take action on chemicals that impact orcas and their prey.		
30a	By March 2019, ECY should develop a prioritized list of chemicals of emerging concern that threaten the health of orcas and their prey and pursue	Identify chemicals most likely to have the largest impact on Southern Resident orcas, directly, or to their prey, or to the	Ecology, Puget Sound Institute with support from PSMP Toxics WG	**Ecology:** Ecology, in collaboration with the PSEMP Toxics work group, is working with regional partners to conduct a risk-based CEC prioritization. This work is currently under-funded, with a small grant from PSP.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	policy and/or budget requests in the 2019 legislative session to prevent the use and release of chemicals of emerging concern into Puget Sound.	ecosystem that supports both.		Ecology is implementing the Safer Product for Washington program (SSB 5135) to address five priority chemical classes and products, including PFAS, phthalates, phenolic compounds, flame retardants and PCBs. Ecology also received funding to accelerate the development and implementation of Chemical Action Plans and conduct product testing to address these chemical classes that impact the heath of orcas and their prey. Ecology is seeking supplemental funding for enhancing the Local Source Control Partnership to address local sources of toxics and support local government efforts for source control.
30b	Direct ECY to convene discussions and develop a plan to address pharmaceuticals, identifying priorities, source control and wastewater treatment methods.	Undertake CAPs for prioritized chemicals. And, update CAP rules to accommodate CECs. The Legislature could ban or give ECY necessary authority to ban or phase-out chemicals. Implement pollution prevention actions around problem chemicals. Implement treatment, management, or cleanup actions around problem chemicals. Reallocate, or allocate new funding, to reduce toxics loading, and exposure. Direct ECY to	Ecology, Legislature	**Ecology:** Ecology has hired part-time staff to convene discussions and access CECs and pharmaceuticals for treatment approaches and source control.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
		convene discussions and develop a plan to address pharmaceuticals, identifying priorities, source control and wastewater treatment methods.		
	Recommendation 31: Reduce stormwater threats and accelerate clean-up of toxics that are harmful to orcas.			
31a	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.	Reallocate, reprioritize, or allocate new funding, to accelerate cleanup and threat reduction.	Legislature	Funding available, comparable with past funding. Not enough. Questions about how 'targeted', or 'prioritized'.
31b	Prioritize and fund clean-up actions likely to have the greatest benefit to Southern Resident orcas.	Fund partners to remove toxic materials	Ecology	**Ecology:** Pilot project ($3.7m). Funding available. Not enough--just pilot funding. Questions about how 'targeted', or 'prioritized'.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
31c	Identify toxic hotspots in the stormwater entering Puget Sound. Prioritize these for retrofits and/or redevelopment to meet current standards.	Provide pass through funding to local entities to identify sources of toxics in known hot spots	Ecology	**ECY:** The Governor's 2019-21 operating budget included $3 million for local source control programs. No funding for local source control programs was provided in the enacted budget. Funding for ECY to identify sources in the Snohomish Basin ($490k).
31d	Increase funding for the Stormwater Financial Assistance Program to incentivize immediate and accelerated retrofits and other source control actions.	Fund and implement stormwater retrofits to reduce threats from stormwater hot spots. Create incentives to redevelop stormwater problem areas to increase treatment and remove toxic materials	Ecology	**Ecology:** Fund and implement stormwater retrofits to reduce threats from stormwater hot spots. 2019-21 Centennial Clean Water ($20m). 2019-21 Stormwater Financial Assistance ($30m). 2019-21 Water Pollution Control Revolving Program ($12m). Funding available. Not enough. Questions about how 'targeted', or 'prioritized'.
31e	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.	Accelerate cleanups in areas where toxic contamination is threatening juvenile salmon and forage	Ecology	**Ecology:** Environmental Resilience - Creosote Piling Removal ($1.89m). Expanded Cleanup Site Capacity ($1.5m). Support Voluntary Cleanups ($800k). Derelict Vessel Removal ($5m). 2019-21 Clean Up Toxic Sites - Puget Sound ($10.5m). Funding available. Not enough. Questions about how 'targeted', or 'prioritized'.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	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.			
32a	Update aquatic life water quality standards focused on pollutants most harmful to Southern Resident orcas and their prey.	Focus on PBDEs, contaminants of emerging concern. Explore setting more protective aquatic life criteria. Report on findings.	Ecology	Contaminants of Emerging Concern (CEC) prioritization will inform this step. Assess results of CEC prioritization.
32b	Direct ECY to consider developing stronger pre-treatment standards for municipal and industrial wastewater discharges under NPDES.	Consider enhanced permits to benefit the Southern Resident orcas.	Ecology; Local Operators	No funding is available to complete work beyond implementing existing standards.
32c	Provide funding for ECY 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.		Legislature; Ecology	At the request of the Governor, $490,000 was provided for point source water pollution Inspection Staff, and $707,000 was provided for water quality specialists to work with landowners and local governments on nonpoint water pollution source issues. ($490k pt. source, $707k non-pt.)

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	Recommendation 33: Increase monitoring of toxic substances in marine waters; create and deploy adaptive management strategies to reduce threats to orcas and their prey.			
33a	Expand and better coordinate existing toxic monitoring programs in Puget Sound focused on chemicals harmful to the Southern Resident orcas.	Monitor air quality. Monitor volatilization of chemicals on water surface	Legislature (Fund)	Not clear on any progress on these recommendations. Some additional funding for PSEMP last session.
33b	Fund the development and implementation of a program to study and monitor the impact of CECs on Southern Resident orcas.	Monitor CECs in PS—via freshwater inputs. Monitor CECs in prey and forage fish. Establish thresholds for CECs that are protective for whales and prey	Legislature (Fund)	Not clear on any progress on these recommendations
Goal 4: Ensure funding, information and accountability mechanisms are in place to support effective implementation.				
	Recommendation 34: Provide sustainable funding for implementation of all recommendations.			
34a	Provide immediate capital and operating funds in the 2019-21 biennium budget to implement near-term high-priority actions.		Governor's Office; Legislature	The enacted 2019-21 operating, and capital budgets included $676 million to implement near-term high-priority actions.

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
34b	Request that the governor and Legislature establish a sustainable, durable funding source to implement these recommendations and meet needs as they arise.			
34c	Include funding to state agencies for staffing, research and ongoing management needed to initiate and implement task force recommendations.			
	Recommendation 35: Conduct research, science and monitoring to inform decision making, adaptive management and implementation of actions to recover Southern Residents.			
35a	Request that NOAA's 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		PSP, WDFW, RCO, Ecology, and other agencies	In the options the Task Force outlined for "Life After the Task Force," the importance of the emphasis in 35d was well recognized. All options seek to complement any future governance body with relevant regional or statewide forums and networks to conduct monitoring and adaptive management (as emphasized in the joint letter from the Puget Sound Partnership's Science Panel and Puget Sound Ecosystem Monitoring Program). Agencies agree that any future governing body should recognize that developing

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	orcas that the recommended actions may produce under a reasonable range of future growth and development scenarios.			a monitoring and adaptive management framework with clear objectives is a necessary next step.
35b	Request that the zooplankton monitoring team engage with the PSEMP and ECY to look at impacts associated with nutrient pollution.			
35c	Request that the Regional Response Team and the Northwest Area Committee assess the connections to and impacts of oil spills on plankton.			
35d	It will be important to use an adaptive management approach to track effectiveness of implemented recommendations, look for unintended consequences, monitor			

Recommendation		Notes	Implementor(s)	Progress as of Nov. 2019
	ongoing ecosystem change and adjust future investments based on our findings.			
	**Recommendation 36**: Monitor progress of implementation and identify needed enhancements.			
36a	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.		Agencies	Completed as of March/June 2019 task force meetings.
36b	The task force will identify changes needed, any new ideas and other actions needed to recover Southern Resident orcas.		Task force	Completed as of Year Two report date (November 8, 2019).

Appendix 3. Task force, working group, steering committee and consulting team members

Task force

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Representative Debra Lekanoff (D)
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Commissioner Steve Johnston
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Appendix 4. Impacts of human sources of nutrients on marine water quality

The following memo was prepared by the Washington State Department of Ecology, Water Quality Program on September 18, 2019:

Introduction

Productivity in Puget Sound is affected by many factors including: the upwelled waters of the Pacific Ocean importing nitrogen and low dissolved oxygen, water temperature, biogeochemical activity in marine sediments and the water column, atmospheric deposition of nitrogen, circulation and exchange of waters between the ocean and watersheds, and nutrient flux from watersheds to marine waters. Healthy nearshore eelgrass and kelp habitats, robust fish communities and diverse macroinvertebrate communities depend on a natural cycle of productivity to create sustainable populations of forage fish, salmonids and orcas.

Climate change is creating warmer temperatures and reduced circulation in Puget Sound degrading water quality and producing conditions that create stress on Puget Sound marine ecology. Deep ocean water entering the Salish Sea is expected to continue to decline in dissolved oxygen levels and increase in the concentration of nitrogen [48, 49]. Excess nutrients from human activities exacerbate the stress on Puget Sound water quality.

When a waterbody has excess nutrients, such as nitrogen and carbon, it can cause excessive plant and algae growth, which ultimately depletes the DO levels in the water. Many parts of Puget Sound have DO levels that fall below the concentrations needed for marine life to thrive and fail to meet our state's water quality standards.

Human sources of nutrients

The Salish Sea Model characterizes human-source inputs as: municipal and industrial wastewater facilities that discharge directly to Puget Sound, and watershed inflows that include both point and nonpoint source nutrient loads. Human sources in watersheds include municipal wastewater, agriculture, forestry and other land use activities that potentially discharge nutrients in diffuse or direct discharges.

The 2019 Salish Sea modeling report [50] evaluated the impact of human-sources on Puget Sound water quality and found that the sum of human sources in Puget Sound are causing violations of state water quality criteria for DO because of excess nutrients from human-sources. Ecology is obligated under the federal Clean Water Act and the State Water Pollution Control Act to take action in order to reduce nutrient loading from human sources that cause or contribute to DO water quality impairments.

Figure 7. Two indicators of eutrophication (dinoflagellate and jellyfish blooms) at Butler Cover near Budd Inlet. Aerial image taken September 26, 2016.

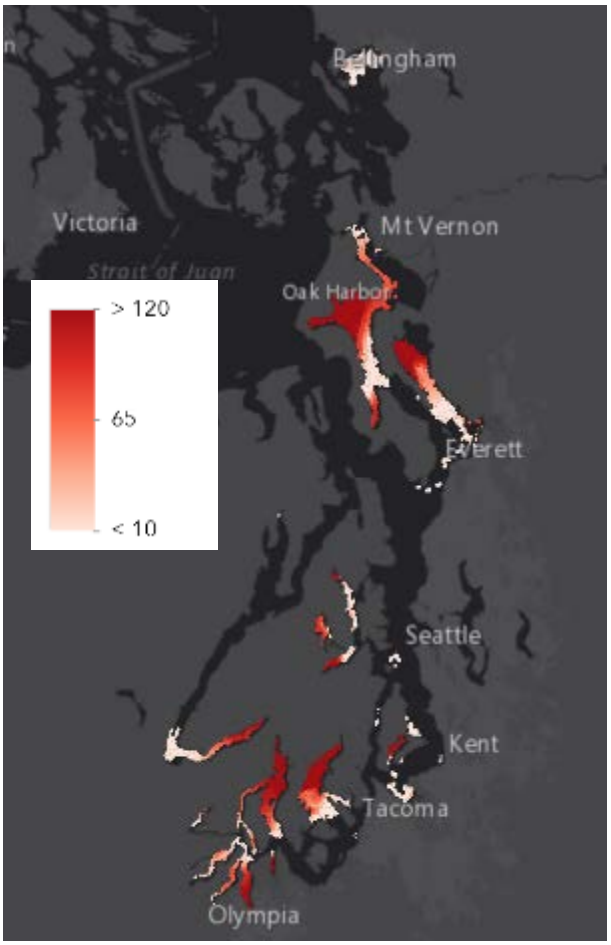
Imbalance of nutrients effects on Southern Residents

In addition to the effect of lowering dissolved oxygen, excess nutrients is also connected to other negative responses in the chemical and biological elements of the marine environment, including:

- Production of carbon dioxide from remineralization of organic carbon, which lowers the pH, contributing to acidification of the water column [51, 52, 53]. As water becomes acidic, less calcium carbonate is available for marine organisms to form shells [54].
- Changes to the benthic (bottom-dwelling) macroinvertebrate community structure and species diversity, habitat compression and shifts to microbial-dominated energy flow, resulting in changes to the food chain [55].
- Changes to micronutrient availability that can lead to increased incidence and duration of harmful algal blooms [56].
- Increased growth and abundance of opportunistic and ephemeral macroalgae, in particular, species of *Ulva* [57].
- Deleterious effects to eelgrass meadows [58, 59]. Declines in eelgrass shoot density with increasing macroalgal abundance have been demonstrated [60, 61].

These ecological effects can reduce the foundations of the marine food web by reducing the habitat and water quality conditions conducive to healthy and robust populations of marine species. Reducing human nutrient inputs to Puget Sound will improve water quality, support diverse nearshore habitats and create a healthy, nutritious marine food web to support forage fish, salmon and orcas. We have the science that confirms human impacts on DO and emerging science points to these other indicators manifesting in Puget Sound.

Figure 8. Duration of days not in compliance with DO criteria caused by human-sources of nutrients.



Ecology's Actions to Reduce Human-sources of Nutrients to Puget Sound

Beginning in 2018, the Department of Ecology initiated the Puget Sound Nutrient Source Reduction Project to use state of the art science and tools to inform policy and regulatory discussions about nutrient management in Puget Sound. We are in a multi-year process meant to inform future decision-making at the local and state levels. Recent Salish Sea modeling results [50] established that human sources of nutrients are causing or contributing to low dissolved oxygen in many sensitive inlets and bays within Puget Sound.

Ecology has been working with federal, state and local partners to develop the tools and data to understand how human sources of nutrients (i.e. wastewater, agriculture, stormwater and others) affects water quality in Puget Sound. We have looked at other U.S. coastal estuaries experiencing similar excess nutrient problems and identified clear lessons from those states, including:

- Engagement and collaboration between stakeholders and regulatory authorities is key to implementing actions to better manage or reduce nutrient discharges to waterbodies.
- General permits are an efficient and effective way to manage changes at wastewater treatment plants that contribute to excess nutrients.
- Nutrient reduction solutions touch on a wide-range of point and nonpoint source human land-use activities.

There has been more than a decade of implementing activities to reduce nutrients in watersheds draining to these other U.S. coastal estuaries. They have had the most success with nutrient reductions from advanced wastewater treatment to reduce nitrogen loads, while also reducing

nonpoint sources in watersheds. Marine water quality has improved in Long Island Sound [62] and Chesapeake Bay [63, 64], and aquatic species that depend on healthy nearshore eelgrass habitats are on the rebound [65] because of those actions. We need to take similar actions to protect and restore Puget Sound water quality and populations of iconic species like Chinook salmon and the Southern Resident orcas.

Ecology is continuing to use the Salish Sea Model to understand the significance of watersheds, potential improvement from advanced wastewater treatment technology, and the combined effect of various nonpoint source reduction strategies to improve Puget Sound DO. Recommended improvements to watershed water quality data collection will further increase our understanding of watershed nutrient loads to Puget Sound and help inform potential next steps for further reductions of human sources of nutrients in watersheds in order to protect Puget Sound.

Over the next several years, Ecology will develop a Puget Sound Nutrient Management Plan that will include the regulatory approaches for point and nonpoint sources of nutrient loading to Puget Sound. In addition to human-source nutrient reductions, the natural function for nitrogen to attenuate in watersheds needs to be restored and protected [66]. Ecology is confident that technology exists to reduce nitrogen from Puget Sound WWTPs and advanced treatment can significantly improve marine water quality. But, the science is also clear that watershed reductions (including point and nonpoint sources) are necessary.

Reducing human nutrients in Puget Sound builds resiliency to Climate Change

Khangaonkar et al (2019) used the Salish Sea Model to evaluate the impacts of climate change over the next 100 years and estimated that water temperatures will increase, DO and pH will decrease, with the area of annually recurring hypoxia could increase 16% relative to Y2000. They also suggest a species shift from diatoms toward dinoflagellates which would further decrease the quality of the marine food web. The predicted response to climate change may be less severe than predicted change to the ocean boundary, and we can create more resiliency to climate change impacts by reducing our burden of nutrients on Puget Sound [67].

As we continue to grow in population, our wastewater infrastructure and land-use activities must adapt to accommodate that growth while further reducing our impact on water quality and ecological resources. Strategically reducing human sources of nutrients now allows more growth without commensurate environmental degradation and is cheaper and more efficient in the long run. As a region, we need to start now on improvements that will take a decade or more to build and implement.

As we reduce human sources of nutrients, we will improve the overall water quality of the Puget Sound affording increased resiliency to the marine environment that will hedge against increased ocean temperatures and climate change.

Recommendations

Given our region's growing population and our current science on excess nutrients in Puget Sound, Ecology believes now is the time to start the process. Infrastructure investments take time and money, and collaboration with communities to plan for these investments.

Through discussions the Marine Water Quality Implementation Strategy working group and the Puget Sound Nutrient Reduction Forum advisory group led by Ecology, three specific recommendations have been identified by Ecology to support this.

Begin addressing human sources of nutrients

Recommendation 39: Develop a National Pollutant Discharge Elimination System permit framework for wastewater treatment in Puget Sound to reduce nutrients in wastewater discharges to Puget Sound by 2022.

- Ecology should explore ways to use its NPDES regulatory authority to address point sources of nutrients. Significant nutrient reductions can be achieved with implementing advanced wastewater technology.

Implementation Details

Ecology is proposing to develop a Puget Sound Nutrients General Permit to control nutrient discharges from domestic wastewater treatment plants (or sewage treatment plants). The Department issued a public notice for a Preliminary Determination to develop a Puget Sound Nutrients General Permit on August 21, 2019. The purpose of this comment period is to obtain feedback about whether or not a general permit is the right NPDES permit framework for this purpose.

The alternative to a general permit is to include nutrient control requirements in each of the WWTP's individual permits, one by one, as they are reissued over the next five to 10 years. Discharges of excess nutrients to Puget Sound from WWTPs represent more than 50% of the human sources of nutrients into Puget Sound and significantly contribute to low oxygen levels. Given this, Ecology must require WWTPs to control nutrients consistent with the Clean Water Act and Washington's Water Pollution Control Act.

More information is available: https://ecology.wa.gov/Water-Shorelines/Water-quality/Water-quality-permits/Water-Quality-general-permits.

Recommendation 40: Better align existing nonpoint programs with nutrient reduction activities and explore new ways to achieve the necessary nonpoint source nutrient reductions.

- Establish minimum requirements for nonpoint BMPs to ensure they meet water quality standards.
- Expand existing state and local nonpoint programs to include nutrient reduction best management practices (BMPs) to begin correcting known land use problems in watersheds.

Implementation Details

There are existing nonpoint programs that can be expanded to address known problems from nutrient runoff from agricultural, suburban/urban, and rural land use activities. Many of these nonpoint implementation actions have multiple benefits for water quality improvement including nutrient reduction.

Ecology is developing minimum performance requirements for agricultural nutrient reduction BMPs that will meet water quality standards. Continuing that process and beginning to explore other ways to achieve meaningful nonpoint nutrient reductions will occur over the next few years as Ecology continues working with stakeholders using state-of-the-art modeling to develop an integrated Puget Sound nutrient management plan for point source and nonpoint source nutrient reductions.

Modernize watershed data collection for nutrients

Recommendation 41: Collect high-quality nutrient data in watersheds to fill key knowledge gaps of baseline conditions.

- Augment key watershed monitoring stations with continuous nutrient monitoring technology to improve our understanding of watershed nutrient loads and establish baseline conditions to measure future change.
- Explore potential tools to quantify human sources in watersheds and evaluate nutrient management actions to meet total watershed nutrient reduction goals.

Implementation Details

Making science-based nutrient management decisions depends on having the right tools and high-quality data. The Salish Sea Model[10] is our best tool for understanding the marine waters of

[10] https://ecology.wa.gov/Research-Data/Data-resources/Models-spreadsheets/Modeling-the-environment/Salish-Sea-modeling

Puget Sound, and evaluating the best suite of nutrient load reductions necessary to achieve water quality standards.

We can improve our understanding of the timing, and magnitude of nutrient discharges from watersheds with modest enhancements to existing long-term watershed monitoring networks. Monitoring is critical to establish a strong scientific basis to characterize both baseline conditions and to measure progress as nutrient reduction actions are implemented on the landscape. Nutrient management decisions in watersheds depend on quality science and data to understand complex interactions between human sources and freshwater and marine water quality.

Appendix 5. Continuing the mission of Southern Resident orca recovery

As noted in **Chapter 4**, the Southern Resident Orca Task Force will sunset on November 8, 2019. The task force recommends that an oversight group continues this important work, incorporating the following elements:

- Is co-managed by the Governor's Office and tribes.
- Coordinates with federal agencies in both the United States and Canada to stay connected to ongoing policies around species recovery.
- Aligns with governor's priority on diversity, equity and inclusion and environmental justice.
- Maintains some element of the working group structure and provides ongoing support and facilitation of working groups by state agencies.
- Continues engagement from non-profits, businesses and other stakeholders to monitor implementation of existing recommendations, consider new recommendations and recommend course corrections for continued recovery.
- Maintains and enhances public visibility and interest in this crisis and facilitates a robust public engagement process.
- Builds on ongoing monitoring and reporting to maintain accountability to the public.
- Maximizes institutional durability, at least until the population reaches 84 whales by 2028.[11]

The task force recommends the following path forward:

NEW Recommendation 42: Create one or more entities with authority and funding to recover and advocate for Southern Resident orcas by implementing task force recommendations, creating new recommendations as needed and reporting to the public, governor and tribal co-managers on status.

- Requires legislative funding.
- Refer to **Appendix 1** for related actions and implementation details.

The task force proposed the following options for the Governor's Office to consider:

[11] In its 2018 report, the task force set forth the goal of increasing the Southern Resident population to 84 whales by 2028, or "10 more whales in 10 years."

- **Option 1: Expand existing agency capacity.** Expand the capacity and function of the Governor's Salmon Recovery Office to include orca recovery (e.g., Governor's Salmon and Orca Recovery Office). This option leverages existing agency infrastructure and is modeled after the Salmon Recovery Funding Board with policy coordination and administration functions within the proposed Governor's Salmon and Orca Recovery Office and a policy board comprising governor-appointed members and agency heads.
- **Option 2: Create a new executive level team in Governor's Office.** Create an executive-level salmon and orca leadership team in the Governor's Office. This option includes explicit tribal co-manager engagement by the Governor's Office. This option houses the main functions of the policy leadership team within the Governor's Office and maintains an executive-level focus on recovery.
- **Option 3: Create a new orca recovery office.** Create an orca recovery office led by technical experts. This option creates a new office that is staffed to implement actions. This office can be located within the Governor's Office or within an existing agency. The key element of this option is that it is not a stakeholder-led process.

The task force also recommends incorporating PSP's recovery system into any of these options, as appropriate. PSP is well-positioned to contribute to vessels recommendations, coordinate with Canadian representatives and actions, support scientific monitoring, advise on communications and track progress. Likewise, Salmon Recovery Councils on the Columbia River and Washington Coast could be useful partners.

Refer to the sections below for additional detail on the structure, partnerships, implementation details, benefits and barriers of each option described above.

Structure

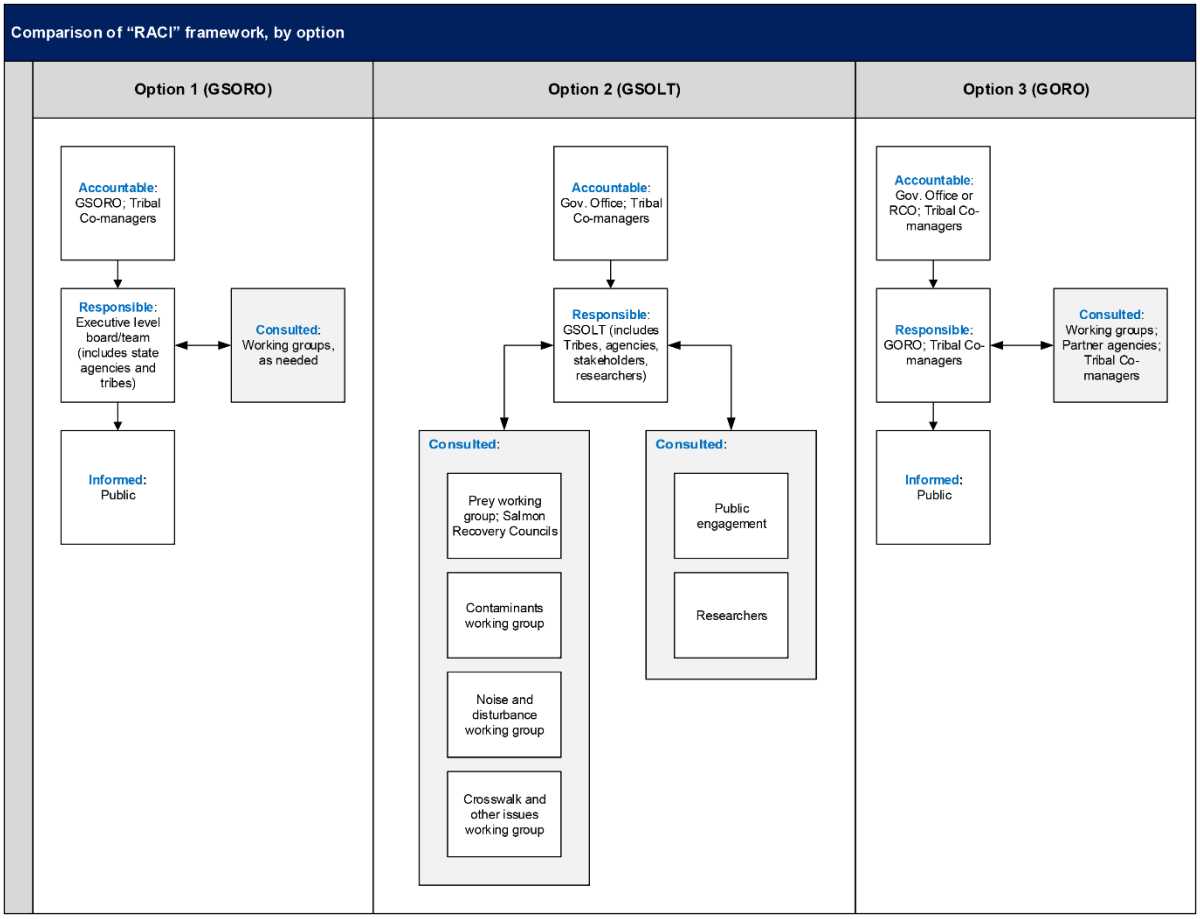
Responsible-Accountable-Consulted-Informed Framework

The terminology used throughout this section draws from the "RACI" framework.[12] The framework is summarized as follows:

- **Responsible**: those who do the work to complete the task. At least one individual must be "responsible," although others can be delegated to assist in the work required.
- **Accountable**: the individual ultimately answerable for the correct and thorough completion of the deliverable or task. The one who ensures the prerequisites of the task are met and who delegates the work to those responsible. The accountable individual must approve work that the responsible individual(s) provides. There must be only one accountable specified for each task or deliverable.

[12] https://web.archive.org/web/20180822181406/https://pmicie.org/images/downloads/raci_r_web3_1.pdf

- **Consulted**: those whose opinions are sought (typically subject matter experts) and with whom there is two-way communication.
- **Informed**: individuals who need to be informed after a decision or action is taken and may be required to take action as a result of the outcome (one-way communication).



Leadership and representation

Option 1: Governor's Salmon and Orca Recovery Office

- Establish executive-level board, or council to oversee orca recovery.
- GSRO provides policy support in coordination with the Governor's Office.
- Executive-level membership to be determined – some appointed by the Governor, some ex-officio state agency representatives.
- Staffed by designated agency representatives.

Option 2: Governor's Salmon and Orca Leadership Team

- Governor's Office leadership as Chief Executive in co-management role with tribes accountable for orca and salmon recovery, drawing from recommendations from the Salmon and Orca Leadership Team. This option depends on the Governor's Office and tribes agreeing to how the co-management roles will cover salmon and orcas.
- Salmon and Orca Leadership Team (similar concept to current task force) responsible for monitoring implementation of existing recommendations, considering new recommendations coming from working groups and recommending course corrections for continued recovery. Representative composition with the same sectors as current Southern Resident Orca Task Force (e.g., tribes, elected officials, state agencies, fishing interests, non-government organizations, business, federal agencies and Canada). Appointed by the governor, balancing the need to be small and nimble yet representative.

Option 3: Governor's Orca Recovery Office

- Executive team chaired or co-chaired by technical experts with experience in recovering marine mammal populations. Leadership should not be a stakeholder group.
- Team size should be lean and nimble to facilitate effective, responsive analysis and decision-making.
- One or two leads for each threat area (prey abundance, contaminants, vessel impacts, climate change and population growth, new/emerging). Could be working group leads.
- Tribal representatives as tribes see fit.
- Stakeholder interests represented in working groups, not at the leadership level.

Reporting structure

Option 1: Governor's Salmon and Orca Recovery Office

- Expand GSRO statutory authority to include orca recovery.

Option 2: Governor's Salmon and Orca Leadership Team

- Salmon and Orca Leadership Team holds twice-yearly public meetings to monitor progress on implementing recommendations, consider new information sourced from expanded working groups, take public input and identify necessary course corrections.
- This group must answer to the public and to the governor and tribes as co-managers, possibly through a Results Washington dashboard/accountability structure, subcabinet, or initiatives similar to Washington Maritime Blue 2050 or U.S.-Canada Maritime Commerce Resilience.
- Biennial comprehensive reviews due beginning November 2021, with brief annual updates.

Option 3: Governor's Orca Recovery Office

- Report to the governor or Washington State Recreation and Conservation Office; analogous to the Salmon Recovery Office. Goal of structure is to provide executive support as well as continuity between administrations.

Key goals and actions

Option 1: Governor's Salmon and Orca Recovery Office

- Maintain momentum and focus on orca recovery.
- Coordinate policy and budget initiatives specific to orca recovery.
- Coordinate the actions, science and progress through individual agencies.

Option 2: Governor's Salmon and Orca Leadership Team

- Maintain executive-level attention on salmon and orca recovery.
- Track progress on Southern Resident Orca Task Force actions, recommend new actions based on information from working groups, identify course corrections and maintain the broad coalition of voices working together toward recovery.

Option 3: Governor's Orca Recovery Office

- Drive and synchronize state actions toward achieving Southern Resident population recovery goals.
- Prioritize existing recommendations and work with governor and Legislature to implement.
- Evaluate, update and add new recommendations in response to population status.
- Identify roles and schedules for implementation of each recommendation, especially where authorities or actions overlap. Recommendations treated like projects to be acted on (or not) with roles, schedules, accountabilities and outcomes clearly defined.
- Measure and track progress towards goals, provide transparency and accountability and a mechanism for public engagement.

Partners and stakeholders

Tribal co-managers

Option 1: Governor's Salmon and Orca Recovery Office

- Tribal treaty rights – tribes will engage on multiple fronts as appropriate, including appointments to the board or council.

Option 2: Governor's Salmon and Orca Leadership Team

- Accountable/approver in co-manager role.
- Responsible for developing Salmon and Orca Leadership Team recommendations with stakeholders, agencies and others.
- Consulted as working group members, clarifying new work needed.

Option 3: Governor's Orca Recovery Office

- Co-managers with seats on council and working groups.
- Additional roles, depending on tribal input.

State, federal and international partner agencies

Option 1: Governor's Salmon and Orca Recovery Office

- Hybrid executive-level and GSRO structure offers a statewide and transboundary perspective.

Option 2: Governor's Salmon and Orca Leadership Team

- Responsible for developing Salmon and Orca Leadership Team recommendations with tribes, stakeholders and others.
- Responsible for facilitating working groups.
- Consult role with transboundary organizations.

Option 3: Governor's Orca Recovery Office

- Serve as collaborators and implementers.

Working groups

Option 1: Governor's Salmon and Orca Recovery Office

- Use existing working groups on as-needed basis to address specific topics as they arise.
- Do not have standing meetings but may hold periodic check ins to keep the teams intact.

- Each working group would continue to be led by staff from the Washington State Department of Ecology, Washington Department of Fish and Wildlife, and Puget Sound Partnership. These three staff leads would be ex-officio members of the Governor's Salmon and Orca Recovery Office.
- One new staff to coordinate with the working groups and organize the logistics and reporting of the board or council, these staff would report to the executive coordinator.

Option 2: Governor's Salmon and Orca Leadership Team

- Existing prey and contaminants working groups continue to source information to the Leadership Team.
- Reframe the vessels working group to "noise and disturbance working group" (not limited to just vessels).
- Use existing structures to the maximum extent with plenty of expertise; these groups are skilled and should not be recreated.
- Add a new working group that addresses crosswalk and "none-of-the-above" issues (i.e., climate change, population growth, synergy across working group silos and gaps in that structure).
- Agency-led technical expertise and facilitation are critical. Detailed quarterly updates on progress. Produce annual course-correction recommendations that are written and reviewed by the working groups and provided to the Leadership Team and the public.

Option 3: Governor's Orca Recovery Office

- Led (or co-led) by members of the Governor's Orca Recovery Office.
- Lead is responsible for the work products and driving the process to answer key scientific questions.
- Working groups should be representative and diverse (tribal/public/private).
- Current members should be included for continuity and efficiency. Others may be added.

Public

Option 1: Governor's Salmon and Orca Recovery Office

- The public will remain engaged through multiple pathways; public engagement brought these issues to the forefront and remains critical.

Option 2: Governor's Salmon and Orca Leadership Team

- Consulted: Public engagement brought these issues to the forefront and remains critical; public pressure reminds elected officials and pushes government structures forward.

Option 3: Governor's Orca Recovery Office

- Provide feedback.

Implementation

Level of effort and funding

Option 1: Governor's Salmon and Orca Recovery Office

- GSRO Staffing (1 FTE).
- Operational costs for the executive level policy board (Approximate = $200,000/biennium).
- Agency staff support for PSP, WDFW, ECY (3 FTE or in-kind).
- Plus additional contracted consulting services if required as start up.

Option 2: Governor's Salmon and Orca Leadership Team

- Results WA-style meetings with the governor, tribes
- Salmon and Orca Leadership Team – Facilitate twice-annual, all-day public meetings. Meeting packets with outputs from working groups. Manage public comment process and compile results.
- Facilitate quarterly or twice-annual meetings for four working groups (the three existing, plus a new one). Half day.
- Manage website communication tools
- Produce more detailed biennial report beginning November 2021, continuing until the population reaches 84 whales by 2028.

Option 3: Governor's Orca Recovery Office

- Office would be 5 to 7 FTEs (Exec director, leads for each area, public engagement/communications and support).
- Quarterly reports on progress towards goals.
- Technology: Dashboard to show status of recommendations and progress towards goals, provide transparency and accountability.
- Communication and public engagement through dashboard, quarterly reports and quarterly public meetings.
- Stipend for working group member travel.

Timeline

Option 1: Governor's Salmon and Orca Recovery Office

- Could be implemented relatively quickly.

Option 2: Governor's Salmon and Orca Leadership Team

- November 2019 – January 2020 – transition plan from Orca Recovery Task Force into an interim structure.
- Winter/spring 2020 – form new oversight and accountability Leadership Team. Secure funding through the Legislature.

Option 3: Governor's Orca Recovery Office

- Executive order to start ASAP, should be in place by end of legislative session or sooner.

Benefits and barriers

Benefits

Option 1: Governor's Salmon and Orca Recovery Office

- The Governor's Salmon and Orca Recovery Office would provide statewide consistency, coordination and accountability for salmon and orca recovery:
- Governor's Office or RCO can coordinate executive engagement with additional resources.
- GSRO can work with RCO to manage associated grants and contracts.
- GSRO could leverage its existing role in coordinating among the tribes, state and federal agencies, regional salmon recovery organizations, local partners and jurisdictions, and federal and state legislative activities.

Option 2: Governor's Salmon and Orca Leadership Team

- Oversight and accountability – Executive-level attention and engagement are crucial to address this crisis, implement the remaining recommendations, develop new recommendations, monitor progress and adjust tactics. Without executive-level leadership, resident orcas and Chinook salmon are doomed to extinction. Salmon and orcas have been listed for 20 and 15 years, respectively, but we did not galvanize this much action without the leaders in our region setting the table and the public applying pressure.
- Power – It took the breadth of the current task force table to compel actions. Tribes, fishing interests and non-governmental organizations make sure government processes do not revert to business as usual, and agencies bring expertise and structure from existing programs.
- Structure – Hybrid executive and working group structure offers a statewide and transboundary perspective and reflects the importance of salmon runs throughout the state and transboundary issues with Canada.

- Efficiency – Agency-led working group processes continue through existing and refined structures.

Option 3: Governor's Orca Recovery Office

- Focus on orcas is championed and maintained. (Orca recovery includes, but is not the same thing as, salmon recovery.)
- Tribal representation as recommended by tribes.
- Gold star and accountable guidance for decision-makers.
- Task force work recommendations are implemented and evolve.
- Continued engagement by diverse stakeholders with deep knowledge and experience.
- Informed think tank to brainstorm, create and evaluate solutions.
- Goal is not to duplicate efforts within agencies, but to synchronize towards orca recovery – identify gaps and priorities.
- Serve as the gold standard for non-biased information about the orcas.

Barriers

Option 1: Governor's Salmon and Orca Recovery Office

- Would require additional funding.
- May require statutory changes.

Option 2: Governor's Salmon and Orca Leadership Team

- Identifying and maintaining durable funding and attention.

Option 3: Governor's Orca Recovery Office

- Funding.
- Time to implement.

Appendix 6. Public comments

Public comments were welcomed throughout 2019 and considered in the final drafting of this report. All public comments received in 2019 are available in the following folder and its sub-folders: https://pspwa.box.com/s/vdg8outmj17ccras2oj70yd43s75rve1

This appendix summarizes input received during the official public comment period (October 14–25, 2019) on the October 2019 draft report. The task force received 953 public comments on this report and its recommendations.

Individual comments

Habitat

The task force received 486 comments related to salmon habitat, with the following key themes:

Themes	Comments	% of total
Human population growth and net ecological gain	478	98%
Restore critical habitat and sensitive ecosystems	71	15%
Funding restoration projects	6	1%

Life After Task Force

The task force received 470 comments related to continuing orca recovery work after the task force sunsets in 2019, with the following key themes:

Themes	Comments	% of total
Support for Option 2	444	95%
Support for continuing long-term orca recovery efforts	24	5%
Include tribes as co-managers	20	4%
Role of stakeholders and the public	5	1%

Hydropower

The task force received 268 comments related to hydropower, with the following key themes:

Themes	Comments	% of total
Breach the lower Snake River dams	217	81%
Breach dams (specific dams not identified)	49	23%
Do not breach the lower Snake River dams	1	<1%
Howard Hanson dam fish passage	1	<1%

Urgent action

The task force received 229 comments urging them to take immediate action to recover Southern Residents.

Vessels

The task force received 131 comments related to vessels, with the following key themes:

Themes	Comments	% of total
Research vessels	111	85%
Impacts of cruise ship, whale watching and general vessel traffic	9	7%
U.S. Navy testing	8	6%
Fast ferries and water taxis	7	5%
Oil spills	6	5%
Maritime Blue	3	2%

Research impacts

The task force received 125 comments with concerns around the impacts of research on Southern Residents. The majority of these comments were based on a form letter containing the following key themes:

- Define and implement a moratorium on research.
- Ban captures and captivity.
- Determine ways to include unbiased, nonaffiliated public review.
- Stop any funding by the aquarium industry such as SeaWorld.
- Enacting Emergency Orders under the Species at Risk Act.

Additional public comments

The following themes received less than 10% each of the total number of public comments:

Themes	Comments
Forage Fish	62
Progress Report	58
Harvest	22
Contaminants	20
Text Edits	16
Climate Change	15
Funding	14
Co-management	9
Public engagement	8

Predation	7
Prey	7
Enforcement & Regulation	6
Hatchery	5

Organization/coalition comments

The task force also received formal comment letters from the agencies, organizations and coalitions listed below. Letters in full are available in the following folder:

https://pspwa.box.com/s/vdg8outmj17ccras2oj70yd43s75rve1

- City of Shoreline
- Friends of the San Juans
- King County Department of Natural Resources and Parks
- Lifeforce Foundation
- National Oceanic and Atmospheric Administration Fisheries West Coast Region and Northwest Fisheries Science Center.
- Northwest Environmental Advocates
- Oceana
- Orca Conservancy
- Orca Network
- Port of Seattle, Port of Tacoma and the Northwest Seaport Alliance
- Roza Irrigation District
- San Juan County Council
- Seattle Aquarium
- Skagit County
- United States Navy
- Washington Environmental Council
- Washington Public Ports Association
- Washington State Association of Counties
- Washington State Ferries
- Washington State Recreation and Conservation Office
- Whale and Dolphin Conservation
- Whale Trail

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