TESTIMONY OF
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NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

ON

H.R. 7332 (REP. MATSUI) – WHALE CHARTS ACT OF 2026
AND
H.R. 9621 (REP. BAUMGARTNER) – NORTHWEST ENDANGERED SALMON PREDATION PREVENTION ACT OF 2026

BEFORE THE

SUBCOMMITTEE ON WATER, WILDLIFE AND FISHERIES
COMMITTEE ON NATURAL RESOURCES
U.S. HOUSE OF REPRESENTATIVES

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Good morning, Chairman Hageman, Ranking Member Huffman and Members of the Committee. Thank you for the opportunity to testify today on the Whale Charts Act of 2026 and the Northwest Endangered Salmon Predation Prevention Act of 2026.

My name is Richard Merrick. I have twin Masters degrees in Marine Resource Management and in Biological Oceanography, and a PhD in Fishery Science. I was a NOAA Fisheries employee for 30+ years, starting as a Fishery Observer in 1983 and retiring as Chief Science Advisor and Director of Scientific Programs in 2017. I remain active in the field as a scientific advisor to NOAA (through the Atlantic Scientific Review Group and Atlantic Large Whale Take Reduction Team), the New England Fishery Management Council, the Gulf of Maine Research Institute, the North Pacific Research Board, and the National Academy of Science, Engineering and Mathematics.

Most of my career with NOAA focused on provision of scientific advice to managers and constituents on the conservation of marine mammal and fish species

at risk. The earliest part of my NOAA career was on West Coast pinniped – fishery interactions. I was part of the team working in the mid-1980s to deter California sea lion predation on endangered steelhead at Ballard Locks in Seattle and understand the difficulties in deterring seals and sea lions from predating on an available food source. I continued work with Steller sea lions though my time at NOAA AFSC and as part of this work, I was responsible for collecting Steller sea lions, by shooting, to ascertain their health and exposure. As such, I understand the difficulties of using lethal means to remove pinnipeds.

I transferred from NOAA Alaska Fisheries Science Center to the Northeast Center in 1997 to develop NOAA's protected species program for the Northeast US. My immediate mission there was to develop a program to find free-ranging endangered North Atlantic right whales to support a variety of scientific activities, most notably estimation of population abundance and the provision to managers and mariners of the locations of these whales in something close to real time. This program significantly reduced vessel strike mortalities for right whales and similar work continues today at NOAA Fisheries Northeast and Southeast Fisheries Science Centers.

Today I will provide my observations on two Acts under consideration based on my 30 years of experience.

Whale Charts Act of 2026

Based on NOAA's conservation accomplishments from its North Atlantic right whale (NARW) survey and sighting advisory system, it makes perfect sense to advance this effort and expand it to other large cetaceans! NOAA has been running a comparable program on the East Coast for NARW since ca. 1998 and the benefits to the conservation of NARW have been manifold. A brief discussion of that program and its accomplishments to date will convey some of the conservation gains that can be made through near-real time monitoring and distribution mapping of cetaceans.

We started the North Atlantic right whale aerial survey program (ca.1998) to locate and identify right whales year around. These surveys and data from past surveys helped us define areas with a long history of seasonal occupation leading to the current Seasonal Management Areas in New England waters. This aerial survey program continues to the present through partnerships with the States, NGOs and Research Institutions (like Woods Hole Oceanographic Institute (WHOI), New England Aquarium, Provincetown Center for Coastal Studies Clearwater Aquarium, and the Riverhead Foundation/NY DMF).

Right whales are always on the move, migrating through NE waters twice a year between southern calving grounds and summer foraging areas in the NE and Canada, and our aerial surveys were insufficient to capture these movement patterns. We initiated the first passive acoustic listening program for large whales so that we could locate whales in close to real time along the migratory path in NE waters. The initial short-term deployment of two buoys on Georges Bank in coordination with Cornell University was a proof of concept to determine whether we could reliably find right whales. The success of this exercise led to the year around deployment of ten bottom mounted autonomous recording units (ARUs) on Stellwagen Bank NMS (proving that large whales were on the Bank year around), Then we added ten surface tending buoys in the Boston Traffic Separation scheme which provided mariners real time alerts of whale presence all along the shipping lanes.

We remained concerned that these deployments were all very site specific. We needed something more wide ranging, which led to our development with WHOI (and funded by the Office of Naval Research) of free-ranging Slocum gliders that could effectively patrol coastal waters for right whales year around 24/7.

All this work was led by a team of acousticians at NOAA's Northeast Fisheries Science Center – the first such group in NOAA Fisheries – collaborating with academic scientists. The program has continued to expand over the past two decades. In collaboration with the US Navy, they developed CetSound or Cetacean & Sound Mapping which consists of two mapping tools: CetMap and SoundMap. Both tools assist in evaluating the impacts of man-made noise on cetacean species, which include whales, dolphins, and porpoises. This all fed into the development of NOAA's Ocean Noise Strategy. Today, NARW passive acoustic listening arrays are deployed all along the East Coast of the US largely through Congressionally appropriated NARW funding.

Data from the aerial surveys and passive acoustic devices complement each other. Passive acoustic data provides additional information on whale locations, 24/7, in good weather and bad, but cannot tell us much about the animal's identity, condition or exact location. Aerial survey data is important for animal locations, photo identification of animals, health assessments, and calibration of acoustic devices. Together these two types of surveys feed several whale alert systems that provide mariners with close to real time locations of whales and information to scientists attempting to evaluate whale condition and numbers.

Of course, there is much room for improvement. Only some passive acoustic systems provide information in near-real time, and only some aerial surveys are integrated into dynamic strike avoidance programs for NARWs. And existing

monitoring efforts are limited by their geographic coverage as well as by the availability of the whales to passive acoustic and aerial detection. Effectiveness could be improved through broader spatial coverage, the addition of novel platforms, better integration of existing surveys into a real-time monitoring system, and, potentially, the development of alternative detection technologies. This bill, if enacted and funded, would help with that effort.

Aerial surveys and passive acoustic monitoring have been helpful in supporting the science needed to recover the NARW population. These efforts, along with the conservation policies that followed, are likely to have contributed to the decline of NARW ship-strike mortalities from large commercial vessels in NE waters. Interestingly, the one recent period when strikes from large commercial vessels increased significantly, was when NARW shifted their summer distribution during 2015-2018 from US waters (e.g., southern New England and the Gulf of Maine) to unsurveyed areas in the Gulf of St Lawrence. This contributed to multiple years of high NARW mortalities there, until Canada could modify its approach to conservation to something similar to NOAA's approach.

The units collecting NARW vocalizations collect data on a host of other species, as do the aerial surveys. It would not be a heavy lift to expand these sighting and mapping outputs along the East Coast to other species. As such, expansion of programs like the NARW program under the Whale Charts Act would surely support conservation of all other large whale species.

Please recognize that this program has benefited from the partnership between NOAA scientists/managers and scientists from State, NGO, and academic organizations. Expansion thru the Whale Charts Act would do well to maintain these partnerships, thus ensuring open access to all data and direct application of those data to support conservation actions by Federal and State managers.

Northwest Endangered Salmon Predation Prevention Act of 2026

First a little bit more about my background -- As a graduate student at Oregon State I was involved with research in the early 1980s on the development of in river acoustic deterrents to California sea lion and harbor seal predation on California's Russian River and in the Columbia River with Oregon Department of Fish & Wildlife and Washington Department of Fish & Wildlife. Later as a NOAA employee, I continued to work on pinniped fishery interactions and was part of the first team to remove specific individual California sea lions predating on steelhead runs at Ballard Locks in Seattle. Throughout my tenure at the Alaska Fisheries Science Center, I studied sea lion diets and was probably the last NOAA staff permitted to lethally collect Steller sea lions. Once I had moved to the East

Coast I continued to be involved with research and application of acoustic deterrents to reduce marine mammal predation on gill net fishers. I also had overall leadership for NOAA's Atlantic salmon recovery program,

These experiences have given me insight into the impact of predation on the recovery of listed fish species that are relevant to understanding the efficacy of "adaptive management" measures provided for in the Northwest Endangered Salmon Predation Prevention Act of 2026 (H.R. 9621), as well as a similar bill not under discussion here, Protecting Columbia River Salmon Act of 2026 (H.R. 9637).

First let's define what **Adaptive Management** (AM) is because it is referenced in H.R. 9621 and seems to have been intended as an element of that bill. This is a major element of most conservation actions today and the working definition used by most conservation agencies goes like this:

> *Adaptive management promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process. Adaptive management also recognizes the importance of natural variability in contributing to ecological resilience and productivity (NRC 2004).*[1]

It is important to keep in mind throughout discussion of H.R. 9621 that if the sponsors intend to pursue Adaptive Management, that management actions must be science based and include the monitoring of outcomes. Neither of these appears to be supported to a significant extent by the bill.

It is also important to recognize what the goals of the bill might be. As, no goal other than to protect salmon from pinniped predation is specified, but one must assume that the Act's authors are primarily concerned about the conservation and recovery of salmon stocks, and I will base my testimony on this.

Will Widespread Reductions in Washington State Pinniped Numbers Promote Salmon Recovery? H.R. 9621, while well intentioned, represents simplistic understandings of how endangered/depleted/overfished species recover, what Washington State pinniped's diets are, and the unintended consequences that result from tampering with ecosystems.

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[1] National Research Council. 2004. Adaptive Management for Water Resources Planning, The National Academies Press. Washington, DC.

- Suggesting the lack of salmon recovery is a result of pinniped predation ignores well-established science on the primary role habitat loss plays in limiting recovery of depleted species/stocks. The implication that predation on adult salmon is inhibiting recovery suggests there is a strong stock recruitment relation between adult fish and subsequent recruits – that is, the more adult salmon there are the more recruits there are. This is true. However, the population of salmon stocks are more likely limited by the amount of habitat available for adult spawning. There is a density-dependent relationship between available habitat and spawning success – the less habitat the lower the room for spawning redds (i.e., the small hollows that salmon clear in streambeds as a place to lay their eggs). Producing significantly more recruits will require much more area for salmon spawning; predation has little impact on recruitment in this situation.

  It is also suggested that predation by seals and sea lions on salmon smolts limits returns. Research in the US and abroad has shown that less than 10% of juvenile salmonids (i.e., parrs or smolts) survive to adulthood. This is because small, juvenile fish are at the base of the aquatic food web as such are prey for a host of predators. For example, Johnson et al.[2] found that at least 66 species of marine predators in Washington and Oregon have a positive relationship with salmon in the saltwater phase, with pinnipeds obviously making a small proportion of those species.

- Limited population level diet data available suggests salmon are not a major part of seal diets. There is little analysis of recent diets of pinnipeds in Washington waters. References from a 2022 Washington Academy of Sciences report[3] are mostly inappropriate as they focus on old collections, areas outside of Washington waters or are of very limited geographic scope. Indeed, some recent studies have found that many prior papers on diet sampling (before 2015) are likely to have significantly overestimated salmon diets, at least in harbor seals, because of over-sampling from estuary areas, the use of additive models,

[2] Johnson, D.H., M. M. Hoover, E. L. Greda, and C.J. Cederholm. (In prep.). Relationships between Pacific Salmon and 605 species of birds, mammals, reptiles, and amphibians in Oregon and Washington. Cited in Cederholm, C. J., D. H. Johnson, R. E. Bilby, L.G. Dominguez, A. M. Garrett, W. H. Graeber, E. L. Greda, M. D. Kunze, B.G. Marcot, J. F. Palmisano, R. W. Plotnikoff, W. G. Pearcy, C. A. Simenstad, and P. C. Trotter. 2000. Pacific Salmon and Wildlife - Ecological Contexts, Relationships, and Implications for Management. Special Edition Technical Report, Wildlife-Habitat Relationships in Oregon and Washington. Washington Department of Fish and Wildlife, Olympia, Washington.

[3] Washington Academy of Sciences. 2022. Pinniped Predation on Salmonids in the Washington Portions of the Salish Sea and Outer Coast. 83 pp.

and other factors.[4] There is only one reference to recent harbor seal diets in the Salish Sea (Thomas et al 2022)[5] that provides a robust analysis of seal diets there and that report suggests salmon make up only a small part of harbor seal diets in the Salish Sea. They developed a DNA-based dataset describing Salish Sea harbor seal diets from 4,625 scats collected at 52 haul-out sites during 2011-2019. This analysis found that the primary prey for harbor seals there was Pacific hake (24% of the diet) followed by Pacific herring (22%). Six species of Pacific salmon were also consumed at much lower percentages (1.6 to 6%), most of which was adult chum or pink salmon.

Similar studies should be conducted for sea lions before conclusions about the consequences of population level consumption of salmonids is discussed.

- Removal of a predator can have unexpected consequences because of the interconnectedness of ecosystem elements. Thomas et al (2022) noted that Pacific hake is the most common prey of harbor seals. Sea lions are also known consumers of hake6. Programs designed to reduce the pinniped population in the Salish Sea would reduce predation on Pacific hake, and the consequence would likely be increasing their predation on salmon smolts.

  Another consequence of the reduction in pinniped abundance in the Salish Sea would be its impact on transient killer whales, also known as Bigg's killer whales. It is likely that the substantial increase in Bigg's killer whale occupation of the Salish Sea, since 2011, is closely related to the increase in harbor seal density there.[7] One study (Shields et al. 2018) estimated that, in 2017, Bigg's accounted for the natural removal of more than 1,000 harbor seals.[8] This killer whale species (whose population is currently growing in

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[4] Tucker, S., Majewski, S., Nordstrom, C.A., *et al*. Do harbour seals in fact target juvenile salmon of conservation concern? Biased diet sampling has provided an illusory perspective of seal impacts. *Can. Journ. Fish & Aq. Sci.* **83**, 1-32 (2026). https://doi.org/10.1139/cjfas-2025-0052. *See also* Clark, C., and Pearson, S., Status and Diet of Harbor Seals in Washington State and Their Impact on Fish Stocks of Concern. 2026. Washington Department of Fish & Wildlife.

[5] Thomas, A.C., Deagle, B., Nordstrom, C. *et al.* Data on the diets of Salish Sea harbour seals from DNA metabarcoding. *Sci Data* **9**, 68 (2022). https://doi.org/10.1038/s41597-022-01152-5

[6] Washington Academy of Sciences. 2022. Pinniped Predation on Salmonids in the Washington Portions of the Salish Sea and Outer Coast. 83 pp.

[7] Shields, M., Hysong-Shimazu, S., Shields, J.C., and Woodruff, J. Increase presence of mammal-eating killer whales in the Salish Sea with implications for predator-prey dynamics. *PeerJ* **6**, e6062 (2018). http://doi.org/10.7717/peerj.6062

[8] *Id.*

Puget Sound) would be negatively impacted by the reduction in available seals for prey, risking their natural population control of pinnipeds.

- Based on my experience and available data/science, it is difficult to believe indiscriminate lethal removals of pinnipeds will promote the recovery of Washington's salmon population. Large-scale removals of a predator as a management strategy have been previously proposed or implemented to reduce predation pressure on various fish and mammal prey. Few have been shown to be particularly effective. Canada's Department of Fisheries and Oceans mounted a major research program to evaluate the impact of harp and grey seal predation on Atlantic cod. The scientific consensus, including several independent peer reviews that I participated in, was that seals were not limiting cod recovery.

  Another example is the Albertan wolf cull that has been ongoing since 2005 in an effort to protect the threatened woodland caribou. It was never demonstrated with scientific evidence that wolves were the cause of the decline in the caribou populations. Ultimately, it was decided the decline was primarily due to habitat loss, so culling the wolves did little to recover the population.

Are Targeted Reductions An Alternative To Widespread Lethal Removals of Washington State Pinnipeds? Localized predator control (rather than widespread pinniped removals) may provide a temporary positive effect on salmonid survival at the population level. But not all seals/sea lions are salmon predators. For example, the vast majority of harbor seals do not even reside in the vicinity of salmon-bearing estuaries and are highly unlikely to forage there.[9] What we found at Ballard Locks and what WDFW/ ODFW have found in the Columbia River is that predation can be temporarily reduced through the removal of specific individual animals at specific high-predation sites. This is where true Adaptive Management is essential, as it must begin with a fairly sophisticated data collection effort to identify and perhaps mark individual problem animals followed by removals and then continued monitoring of the efficacy of the program. But, as we learned at Ballard Locks, removal efforts may have no more than short-term effects, as new sea lions will eventually replace the ones removed.

In many cases, it may be more effective to remove hydrodynamic bottlenecks that cause salmon to queue up at high-predation sites, develop barriers separating pinnipeds from salmonids, or develop innovative new sound deterrents such as Targeted Acoustic Startle Technology (TAST), which has shown promise

[9] Tucker et al., *supra*.

in various deployments in Washington State and elsewhere.[10] All of this, however, requires sound science to develop, test, and then monitor the effectiveness of control methods.

Ultimately, without access to historical habitat and a return of ocean conditions to historical norms these efforts to reduce predation may do little more than prolong the slow decline of Washington salmonid populations.

Is There Another Approach to Population Recovery? If this bill's intention is to promote the recovery of salmon in Washington waters, increasing available habitat may be far more effective than attempting to reduce predation. Some examples of this include the removal of dams on the Elwha, Penobscot and Klamath Rivers.

To quote NOAA on the results of removing two dams on the Olympic Peninsula's Elwha River:

> *Once one of the Olympic Peninsula's most productive salmon rivers, the dams reduced the Elwha River's salmon abundance to a fraction of its former levels. With the barriers removed, aquatic organisms regained access to the entire river. Anadromous fish such as salmon returned to areas that have been void of such species for a century.*
>
> *This free passage has also prompted a rapid increase in salmon life history diversity. One example is the "re-awakening" of summer steelhead, which is likely originating from up-river resident O. mykiss populations. Species such as Pacific lamprey are also increasing following dam removal.*

Similar results are being seen after removal of 2 dams on the Penobscot River (Maine) and 4 dams on the Klamath River (California).

Unfortunately, habitat restoration may not by itself trigger recovery of salmonids. It is becoming clear that marine survival, as affected by changes in ocean conditions over recent decades, has an outsized effect on stock abundance.

In the NW Atlantic, multiple groundfish (e.g., cod) and pelagic fish species (e.g., herring) are showing no sign of recovery from overfishing despite low harvests. For Atlantic salmon, sea ice extent within the Norwegian and Greenland Seas explained the greatest amount (60%) of variation in smolt-to-adult marine survival rates.

The collapse of the Gulf of Maine Pacific cod stock in 2017 and the Bering Sea snow crab stock in 2018-2019 have both been associated with the occurrence

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[10] *E.g.*, McKeegan, K.A., Clayton, K., Williams, R., *et al.* The effect of a startle-eliciting device on the foraging success of individual harbor seals (*Phoca vitulina*). *Sci Rep* **14**, 3719 (2024).

of anomalously warm ocean waters on areas within the range of Washington salmonid stocks.

Ultimately, we need to consider whether changing ocean conditions represent a new ecosystem base line or carrying capacity for many marine species. West Coast salmon stocks may never be able to rebuild to historic levels, particularly if habitat is not restored. In the face of ongoing loss of habitat and changing ocean conditions, it is unlikely that the culling of seals and sea lions will have little measurable positive effect on recovery of these stocks.

Challenges

There are several challenges under the Whale Charts Act. Further development of methods for sensing the presence/location of whales and in identifying whales to species would be helpful. But more research needs to be done to provide precise locations of animals and in how the information is delivered to mariners. The latter is particularly important.

Several approaches to Whale Alerts have been developed by NOAA and its partners over the years, several of which involve the use of AIS as a conduit to returning information on whale presence to mariners. These can provide the models for expansion of information sharing on other species. More work needs to be done here, and NOAA's partners and stakeholders are essential to providing advice on how to improve sharing of information.

Also, while it is efficient to administer Whale Charts Act funds as grants through NFWF, it is important to maintain the partnership between NOAA scientists/managers and scientists from grantees (e.g., State, NGO, and academic organizations.) Expansion of the charting program would do well to maintain these partnerships, thus ensuring open access to all data and direct application of those data to support conservation actions by Federal and State managers.

The greater resource issue under the Whale Charts Act, may, however, be the lack of staff support in NOAA's Science Centers and Regional Management Offices. Reductions in force over the past 2 years has meant the loss of key personnel necessary to maintain current programs, with entirely new staffing necessary to deploy instruments, conduct surveys, and analyze data, and provide advice to managers and mariners called for under the two Acts.

A major challenge for the Northwest Endangered Salmon Predation Prevention Act is simply the lack of data on the diet of seals and sea lions in Washington waters (especially the Salish Sea). Population assessment for Oregon-Washington require updating as the last abundance estimates are a decade or more old (and are imprecise), such that Potential Biological Removal numbers do not

exist or are out of date for harbor seals or California sea lions. As such, accounting takes against PBR will be difficult if not impossible. This makes science based conservation measures under the MMPA difficult to design and maintain.

Also, care needs to be taken that this program truly follows an Adaptive Management approach to maintaining local salmon populations and does not devolve into a program simply to remove pinnipeds from Washington waters. Any predation-reduction program should focus on specific animals at localized, high-predation sites; should follow an iterative scientific process to obtain data on effectiveness, including on the effectiveness in achieving long-term predation reduction, which has seldom been attained, and on ecosystem effects; and should prefer non-lethal forms of removal, including innovative new acoustic technologies.

More fundamentally, however, Congressional attention and funding should focus on policy more likely to contribute meaningfully to salmon recovery, particularly the restoration of salmon habitat. Dam removal can restore passage to spawning grounds and eliminate or mitigate the chokepoints that attract pinnipeds in the first place. The rapid, positive effects for salmon populations seen in the wake of recent dam removal on the Elwha and Klamath Rivers, and on the Penobscot River on the East Coast, are indicative of what can be achieved.