Nos. 23-35322, 23-35323, 23-35324, 23-35354

IN THE UNITED STATES COURT OF APPEALS
FOR THE NINTH CIRCUIT

WILD FISH CONSERVANCY,
Plaintiff-Appellee/Cross Appellant,
v.
JENNIFER QUAN, in her official capacity as the Regional Administrator for the National Marine Fisheries Service, et al.,
Defendants-Appellants/Cross Appellees,
and
STATE OF ALASKA and ALASKA TROLLERS ASSOCIATION,
Intervenor-Defendants-Appellants/Cross-Appellees.

On Appeal from the United States District Court for
the Western District of Washington,
Case No. 2:20-cv-00417-RAJ-MLP

AMICI CURIAE BRIEF OF RAINCOAST CONSERVATION FOUNDATION, SKEENAWILD CONSERVATION TRUST, WATERSHED WATCH SALMON SOCIETY, DAVID SUZUKI FOUNDATION, GEORGIA STRAIT ALLIANCE, PENDER OCEAN DEFENDERS, AND SATURNA ISLAND MARINE RESEARCH AND EDUCATION SOCIETY IN SUPPORT OF PLAINTIFFS-APPELLANTS/CROSS-APPELLEES

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CORPORATE DISCLOSURE STATEMENT

Pursuant to Federal Rule of Appellate Procedure 26.1(a), Raincoast Conservation Foundation, SkeenaWild Conservation Trust, Watershed Watch Salmon Society, David Suzuki Foundation, Georgia Strait Alliance, Pender Ocean Defenders, and Saturna Island Marine Research and Education Society have no parent company, no subsidiary or subordinate company, and no affiliate company. No publicly held company owns 10% or more of Raincoast Conservation Foundation, SkeenaWild Conservation Trust, Watershed Watch Salmon Society, David Suzuki Foundation, Georgia Strait Alliance, Pender Ocean Defenders, or Saturna Island Marine Research and Education Society, or any lesser portion of Raincoast Conservation Foundation, SkeenaWild Conservation Trust, Watershed Watch Salmon Society, David Suzuki Foundation, Georgia Strait Alliance, Pender Ocean Defenders, and Saturna Island Marine Research and Education Society.

AUTHORSHIP AND PREPARATION OF BRIEF

No party's counsel authored this brief in whole or in part; no party, party's counsel, or person other than *amici curiae* contributed money to the brief's preparation or submission.

STATEMENT OF INTEREST OF *AMICI CURIAE*

The *amici* are Canadian conservation organizations with extensive experience in efforts to recover Southern Resident killer whales (SRKW) and their prey.

The **Raincoast Conservation Foundation** ("Raincoast") is a Canadian charity incorporated in British Columbia in 1996. Raincoast team members are empowered by their research to protect the lands, waters and wildlife of coastal British Columbia. They use and produce rigorous, peer-reviewed science and community engagement to further their conservation objectives. One of Raincoast's flagship projects is its ongoing research and efforts to protect cetaceans, particularly whales. This work has included extensive cetacean surveys from 2004-2008 in British Columbia's coastal waters, and current photogrammetry work on Resident killer whales that uses aerial photos of individual killer whales to accurately measure body condition, growth rates, and pregnancy status. These measurements, provide a direct indication of the whales' nutritional status and allow the team to draw reliable inferences about their overall health. This research has become invaluable in

identifying links between Chinook salmon abundance and the whales' reproduction and survival.

Raincoast has been active in the recovery of Southern Resident killer whales (SRKW) and the protection of their critical habitat since they were first listed as Endangered under Canada's Species at Risk Act (SARA) in 2002. They have been a litigant before Canadian and American courts in cases concerning the application of SARA to the Southern Residents, including the legal protection of critical habitat. Raincoast scientists sit as members of the federally led Indigenous and Multi-stakeholder Advisory Group (IMAG) on Southern Resident killer whales that oversees the implementation of threat reduction and recovery measures in Canada. Raincoast scientists also sit as members of four federally led SRKW Technical Working Groups (TWG) that address specific threats to SRKWs. The Prey TWG addresses the impact of Chinook fisheries, the ECHO Technical working group addresses underwater noise of shipping vessels entering the Salish Sea, the Sanctuary TWG addresses small vessels and no-go zones, and the Contaminant TWG addresses exposure and accumulation of chemical toxins in SRKWs. Since 2015, Raincoast has also worked with an international team of scientists to examine

effective recovery measures for Southern Resident killer whales. This modelling[1] shows that increased abundance of prey can improve survival of Southern Residents to the point of either stabilizing or slowly growing their population. Recovery scenarios are even more powerful when combined with other measures to reduce vessel noise and disturbance.

The **David Suzuki Foundation** (DSF) is a Canadian charity incorporated in British Columbia in 1990 for the purpose of exploring, understanding and finding solutions to our most pressing environmental problems. The David Suzuki Foundation works to find ways for society to live and act with the understanding that we are all part of nature and uses science and education to promote solutions that conserve nature and help achieve environmental sustainability and justice. It monitors the implementation of Canada's *Species at Risk Act*, S.C. 2002, c. 29 ("SARA"), and sits on the Species at Risk Advisory Committee, a 22 member committee appointed by Canada's Minister of Environment to advise on SARA implementation. The David Suzuki Foundation promotes the recovery and survival of various aquatic species including Southern Resident killer whales, listed under SARA, and which are affected by National Marine Fisheries Service ("NMFS")

[1] *See* R.C. Lacy *et al.*, Evaluating anthropogenic threats to endangered killer whales to inform effective recovery plans, Sci Rep 7, No. 14119 (2017). Available at https://doi.org/10.1038/s41598-017-14471-0.

decision-making. DSF is a member of the federally led Indigenous and Multi-stakeholder Advisory Group (IMAG) on Southern Resident killer whales that oversees the implementation of threat reduction and recovery measures in Canada. DSF is also a member of federally led Prey Technical Working Group that addresses the impact of Chinook fisheries on Southern Resident killer whales. DSF has been involved in legal action to protect critical habitat of Southern Resident killer whales under Canada's Species at Risk Act (SARA) since 2008.

The **Georgia Strait Alliance** ("GSA") is a Canadian charity incorporated in British Columbia in 1990. GSA is comprised of ten thousand supporters around the province. Grounded in environmental justice, GSA mobilizes and supports collective action to protect the Salish Sea region. This includes work to ensure that species at risk and their habitats are protected through proper enforcement and monitoring of existing laws, as well as the development of stronger environmental regulation. In its work, GSA promotes the conservation of species at risk, including the transboundary Southern Resident Killer Whales, by focusing on threats to habitat. GSA is a member of the federally led Indigenous and Multi-stakeholder Advisory Group (IMAG) that oversees the implementation of threat reduction and recovery measures for Southern Resident killer whales in Canada. GSA is also a member of the federal Contaminant Technical Working Group that addresses exposure and accumulation of chemical pollutants in Southern Resident killer whale. GSA has

been involved in legal action to protect critical habitat of Southern Resident killer whales under the Species at Risk Act since 2008.

Watershed Watch Salmon Society (Watershed Watch) is a science based Canadian charity incorporated in British Columbia in 1998 working to defend and rebuild B.C.'s wild salmon and their habitats. Watershed Watch provides scientific expertise to policy makers, and highlights the large scale issues affecting salmon and their habitat, including unsustainable fisheries. This work includes advancing effective catch monitoring and enforcement that meets international best practices and exposing irresponsible management decisions and fishing practices. Watershed Watch works with First Nations to support highly sustainable known-stock (versus mixed stock) fisheries. Importantly, Watershed Watch represents the public interest in salmon conservation at federal salmon fishery planning tables like Canada's Integrated Harvest Planning Committee as a core member of the Pacific Marine Conservation Caucus.

SkeenaWild Conservation Trust (SkeenaWild) is a science based Canadian charity incorporated in British Columbia in 2007 to carry out science and research initiatives, habitat protection projects, community engagement and education programs. SkeenaWild works with governments, Indigenous Nations, communities and individuals to sustain the long-term health and resilience of the wild salmon ecosystems and local communities in the Skeena River Watershed. These goals are

achieved through the effective use of science, laws and convening to empower communities to protect and strengthen salmon populations, improve management decisions and deepen people's connection with wild salmon. SkeenaWild represents the public interest in salmon conservation at federal salmon fishery planning tables on BC's north coast. This includes processes like Canada's Integrated Harvest Planning Committee and the Northern Panel of the Pacific Salmon Commission.

Saturna Island Marine Research and Education Society (SIMRES) is a Canadian registered charity incorporated in 2013. SIMRES undertakes marine research and education in the Southern Gulf Islands of British Columbia's Salish Sea. In addition to a live stream hydrophone, and whale focused research, SIMRES hosts the Southern Gulf Islands Whale Sighting Network, a citizen led initiative that monitors and gathers field data on whale movements around Saturna, Pender and Mayne Islands. This data is used to better understand the use and travel patterns of Southern Resident killer whales and other cetaceans. The sighters observe, record, and identify all cetaceans from land through direct observation and data collection, including visual reports, photos, distances verified with range finders, and professional quality hydrophone recordings. We identify the pods and individuals when we have adequate information. This data[2] is collected and

[2] Southern Gulf Islands Sightings Network data is presented and stored at https://spyhopper.ca/.

published in an annual report that is shared with various governmental organizations who make decisions about human activity in the Salish Sea. It is noteworthy that the southern part of Saturna Island is a federally designated vessel exclusion zone (Interim Sanctuary Zone) that is designed to restrict vessel traffic from May through November to enable Southern Residents to travel and feed. Recognizing the importance of this area to protect the SRKW, SIMRES works closely with Canadian federal agencies to monitor vessel traffic, fishing and marine mammal violations in the sanctuary zones off Saturna and Pender. SIMRES also sponsored "Critical Distance" at the International Marine Protected Areas Conference (IMPAC 5) in Vancouver, B.C. This is an interactive holographic experience where the viewer sees and hears the effect of ship noise on SRKW communication. Plans are underway to share Critical Distance more widely with Canadian audiences.

Pender Ocean Defenders (POD) is a British Columbia non-government organization formed in 2014. POD's mission is to protect the health of the Salish Sea and the species who live in it and around its shores, from human activity that would cause it harm. An overarching concern for POD is the future viability of the endangered Southern Resident Killer Whales, the J Clan orcas. POD educates through expert speakers, community events, and advocates for quieter critical habitat and less industrial use of the ocean. POD provided written commentary on the Roberts Bank Terminal 2 proposed expansion and in-person feedback to the Port of

Vancouver regarding freighter anchorages in Plumper Sound. POD is based on Pender Island, British Columbia, a Salish Sea island surrounded by the legally designated critical habitat for the Southern Residents. The south, west and north sides of Pender Island are recognized as a priority feeding area for Southern Residents from spring to fall, where restrictions on sport and commercial salmon fishing are in place. The Southwest side of Pender Island hosts a federally designated vessel exclusion zone (called Interim Sanctuary Zone) that allows Southern Residents to travel and feed unimpeded from vessel traffic from late spring to fall. POD members began consultation with officials from Fisheries and Oceans Canada (DFO) in 2019, the first pilot year of the Interim Sanctuary Zones at Pender and Saturna Islands. In 2020, POD joined with members of Saturna Island Marine Research and Education Society (SIMRES) to expand the Southern Gulf Islands Whale Sighting Network to Pender Island. POD sighters monitor both the Interim Sanctuary Zone and other SRKW critical habitat around Pender Island for vessel and fishing infractions, as well as reporting whale presence. POD sighters also have a portal to report to the BC Cetacean Sighting Network.

Members of POD have watched Southern Residents matrilines and families for up to 50 years, and have been reporting to the BC Cetacean Sightings Network since its inception. POD used its observations and data of SRKW presence to effectively argue for expanded temporal operation of the Interim Sanctuary Zones,

now in effect from June to the end of November. As recently as the 1990s, members of POD could observe the wide band of Chinook salmon travelling the western shoreline of Pender Island (now within the Interim Sanctuary Zone) every August, as they headed northwest to the Fraser River. These Chinook would be followed by matrilines of the Southern Residents, feeding and carousing. Members no longer observe Chinook from the surface and the sightings of Southern Residents have also become rare. Another POD member led "Critical Distance,"[3] an interactive holographic experience initially hosted by the Smithsonian Institute, where the viewer sees and hears the effect of ship noise on SRKW communication. Most recently, POD assisted with this presentation to international delegates and Canadian government officials at IMPAC 5 Conference in Vancouver BC.

SUMMARY OF THE ARGUMENT

National Marine Fisheries Service's (NMFS's) violations of the Endangered Species Act (ESA) and National Environmental Policy Act (NEPA) are highly serious and undermine international efforts to save SRKW from extinction. The record shows, and *amici's* research confirms, NMFS cannot legally repeat the same decisions on remand. Specifically, NMFS cannot escape the fact that the southeast Alaska (SEAK) Chinook troll fishery jeopardizes the continued existence of SRKW

[3] Critical Distance was originally hosted at the National Museum of Natural History. *See* https://naturalhistory.si.edu/exhibits/critical-distance.

in violation of the ESA, and increased hatchery releases will aggravate rather than mitigate SRKW's decline due to lack of prey. Because NMFS cannot repeat its decisions on remand, and because the prey increase program would actually harm endangered species, there will be no disruptive consequences of the type that might justify departing from the presumptive Administrative Procedure Act (APA) remedy of vacatur. Furthermore, the economic impacts of partial vacatur (i.e., partial closure of the commercial troll fishery) can be further mitigated by compensating commercial fishers under existing United States statutes, similar to what the Canadian government does as part of its SRKW and salmon conservation efforts.

ARGUMENT

I. Partial Vacatur Is Warranted Here to Prevent Further Environmental Harm.

Vacatur is the presumptive and appropriate remedy in this case. *Env't Def. Ctr. v. Bureau of Ocean Energy Mgmt.*, 36 F.4th 850, 882 (9th Cir. 2022) (vacatur "is the presumptive remedy for agency action that violates the NEPA"); *Cal. Wilderness Coal. v. U.S. Dep't of Energy*, 631 F.3d 1072, 1095 (9th Cir. 2011) (when "an agency's action failed to follow Congress's clear mandate the appropriate remedy is to vacate that action.").

To evaluate a request for remand without vacatur, the Court follows the test from *Allied-Signal, Inc. v. U.S. Nuclear Regulatory Commission*, 988 F.2d 146, 150–

51 (D.C. Cir. 1993). *Pollinator Stewardship Council v. EPA*, 806 F.3d 520, 532 (9th Cir. 2015). Two interdependent prongs cabin the decision: (1) "the seriousness of the agency's errors" and (2) "disruptive consequences of an interim change that may itself be changed." *Pollinator Stewardship Council*, 806 F.3d at 532. The "disruptive consequences of an interim change" factor is only in play when the agency could reaffirm the same decision on remand. *North Carolina v. EPA*, 531 F.3d 896, 929 (D.C. Cir. 2008) ("disruptive consequences cannot save" a decision from vacatur if "fundamental flaws 'foreclose [the agency] from promulgating the same standards on remand'") (cited with approval by *Pollinator Stewardship*, 806 F.3d at 532). This is not such a case.

Furthermore, this Court instructs that unlawful agency actions should be allowed to stand only in "limited circumstances" and "when equity demands." *Pollinator Stewardship*, 806 F.3d at 532. But where, as here, "leaving in place an agency action risks more environmental harm than vacating it," vacatur is appropriate. *Alliance for the Wild Rockies v. U.S. Forest Serv.*, 907 F.3d 1105, 1121–22 (9th Cir. 2018); *see also Pollinator Stewardship*, 806 F.3d at 532 (focusing on whether vacatur would avoid or risk "possible environmental harm").

II. The District Court's Partial Closure of the Commercial Troll Fishery During Remand Is Critical to Saving the SRKW From Extinction.

Amici support the District Court's decision to partially vacate and close a small sector of the SEAK fishery during specific seasons during remand. NMFS's failure to appropriately consider and mitigate the SEAK fishery's contribution to the perilous state of the whales' continued existence are extremely serious errors. Moreover, NMFS cannot paper over these errors on remand to reach the same decision because the fishery is in fact pushing the endangered whales to brink of extinction.

A. Lack of Chinook salmon is endangering SRKW with extinction.

Extensive domestic and international research has established that a key limiting factor preventing recovery of the endangered SRKW population is the reduced abundance and quality of their primary prey, Chinook salmon.[4,5,6] *Wild Fish Conservancy v. Thom*, No. C20-417-RAJ-MLP, 2021 U.S. Dist. LEXIS 195058, at *11 (W.D. Wash. Sep. 27, 2021). Declining quality of Chinook prey includes the decline in both the size and age of chinook salmon. Underwater vessel noise and

[4] John K.B. Ford and G. Ellis. 2006. Selective foraging by fish-eating killer whales *Orcinus orca* in British Columbia. Marine Ecology Progress Series, 316:185–199.
[5] John K. B. Ford *et al.*, Linking killer whale survival and prey abundance: food limitation in the oceans' apex predator? 6 Biology Letters 139-142 (2010).
[6] E. Ward *et al.* Quantifying the effects of prey abundance on killer whale reproduction. 46 J. App. Ecol. 632-640 (2009).

disturbance that contributes to lost foraging opportunities, and the accumulation of pollutants through their salmon diet, have become more intense limiting factors because of the reduced availability of prey. While SRKWs can consume a variety of fish species, up to 90 percent of their spring to fall diet consists of older and larger Chinook salmon[7,8] . Reduced abundance of Chinook prey can be linked to poor body condition and nutritional stress.[9] The best available science indicates that poor body condition and malnutrition in Southern Resident killer whales is associated with premature mortality and reduced fertility (i.e. the deaths of fetuses, calves, and

[7] MB Hanson *et al*. Species and stock identification of prey consumed by endangered Southern Resident killer whales in their summer range, 11Endangered Species Research at 72 (2010).
[8] Ford et al., (2006), supra, at 193.
[9] Joshua D. Stewart *et al*., Survival of the fattest: linking body condition to prey availability and survivorship of killer whales, 12(8) Ecosphere e03660 (2021).

adults) [10,11,12,13] that leads to reduced ability of the population to grow or maintain it numbers.

B. SEAK troll is an inherently unsustainable mixed stock fishery that harvests immature Chinook, preventing recovery of larger, older age classes.

Declining abundance of large, old Chinook salmon is exacerbated by a decrease in the predominant 'age at maturity' and the 'size at age'; meaning there are not just fewer Chinook, there are disproportionately fewer large, old Chinook. Larger, older Chinook are selectively targeted by SRKWs. Declines in size observed during the last 20 to 30 years[14, 15,16] are often in addition to declines in size and age

[10] Samuel K. Wasser *et al*. Population growth is limited by nutritional impacts on pregnancy success in endangered Southern Resident killer whales, 12:6 PLOS ONE e0179824 (2017). http://doi.org/10.1371/journal.pone.0179824.
[11] Fanny Couture *et al*. Requirements and availability of prey for northeastern Pacific Southern Resident killer whales. 17(6) PLOS ONE e0270523 (2023). https://doi.org/10.1371/journal.pone.0270523.
[12] Canada Department of Fisheries and Oceans, Southern Resident killer whale: A science-based review of recovery actions for three at-risk whale populations (2017), https://publications.gc.ca/collections/collection_2018/mpo-dfo/Fs49-12-2-2017-eng.pdf.
[13] Craig O. Matkin et al., Review of Recent Research on Southern Resident killer whales to Detect Evidence of Poor Body Condition in the Population, Independent Science Panel Report to the SeaDoc Society, DOI 10.1575/1912/8803 (2017).
[14] Jan Ohlberger *et al*., Demographic changes in Chinook salmon across the Northeast Pacific Ocean, 19 Fish & Fisheries 533 (2018).
[15] B. Lewis *et al*. Changes in size and age of Chinook salmon (*Oncorhynchus tshawytscha)* returning to Alaska. PLOS ONE, 10(6), e013018 (2015).
[16] Xu, Y *et al*. Climate effects on size-at-age and growth rate of Chinook Salmon *(Oncorhynchus tshawytscha*) in the Fraser River, Canada. 29 Fish Oceanogr. 381–395 (2020).

documented since the 1970s, 1950s and 1920s.[17,18] In some cases, weights of Chinook observed in the 1970s were up to half the average weights from the 1920s, with dominant age classes dropping as much as two years and a corresponding decline in presence of old females.[19]

The SEAK troll fishery is a mixed stock fishery (primarily on Canadian and lower United States Chinook) that also harvests immature Chinook. A working assumption of fishery managers whose stocks are regulated by the Pacific Salmon Treaty, is that the harvest of immature Chinook (not sub legal, but maturing Chinook large enough to be vulnerable to fishing gear), can comprise up to half of the Pacific Salmon Treaty's Aggregate Abundance Based Management (AABM) fishery catches.[20] While changing climate conditions can play a role in recent size declines of Chinook, harvesting fish before they mature can induce adaptations that shifts the age structure of the population toward younger, faster maturing fish.[21] The harvest

[17] WE Ricker, Causes of the decrease in age and size of chinook salmon *(Oncorhynchus tshawytscha)*, 944 Can. Tech. Rep. Fish. Aquat. Sci. 25 (1980).
[18] WE Ricker, Changes in the average size and average age of Pacific salmon, 38 Can. J. Fish. Aquat. Sci. 1636-1656 (1981).
[19] Ricker (1980), supra, at iv.
[20] *See e.g.* R. Hilborn *et al*., The Effects of Salmon Fisheries on Southern Resident Killer Whales: Final Report of the Independent Science Panel, (2012) at ix. https://www.westcoast.fisheries.noaa.gov/publications/protected_species/marine_mammals/killer_whales/recovery/kw-effects_of_salmon_fisheries_on_srkw-final-rpt.pdf.
[21] Ricker (1980), supra, at 6.

of immature Chinook occurs because, unlike other salmon fisheries, the SEAK Chinook troll fishery occurs on the rearing grounds of immature Chinook, and as a consequence, slower growing and older maturing fish are caught before they reach maturity.[22,23,24]

The younger (and smaller) females that reach the spawning grounds now produce fewer and smaller eggs than did the older females of the past.[25,26] Ohlberger and colleagues documented declines in the female reproductive potential of Yukon River Chinook of 24% -35% since the 1970s that resulted from a shift to younger, smaller females.[27]

International threats to the rebuilding of Canadian Chinook populations includes catch in Alaskan fisheries. AABM fisheries managed under the Pacific Salmon Treaty occur in Alaska and British Columbia. Alaska has exceeded its catch ceilings (by 5% or greater) more than 50% the time since 2010 (range is from 6.48% (2010: ~15,000 fish) to 31.42% (2020: ~64,000 fish). By comparison, BC (combined

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[22] Ricker (1981), supra, at 1638.
[23] DG Hankin *et al.*, Evidence for inheritance of age of maturity in Chinook salmon *(Oncorhynchus tshawytscha*), 50(2) Can. J. Fish. & Aquat. Sci. 347-358 (1993).
[24] Hilborn *et al.*, (2012), supra.
[25] Sue CH Grant *et al.*, State of Canadian Pacific Salmon: Responses to Changing Climate and Habitats. 3332 Can. Tech. Rep. Fish. Aquat. Sci. (2019).
[26] Ohlberger *et al.*, (2018), supra, at 541.
[27] Jan Ohlberger *et al.*, The reproductive value of large females: consequences of shifts in demographic structure for population reproductive potential in Chinook salmon, 77(8) Can. J. Fish & Aquat. Sci.: 1292-1301 (2020).

NBC & WCVI) exceeded its catch ceiling once (8.36% in 2016, representing ~13,000 fish). Closure of the Alaskan troll fishery would support Canadian domestic rebuilding of wild Chinook, in addition to its benefits to whales. Halting, and subsequently moving, the Southeast Alaska troll fishery during the summer and winter seasons would enable tens of thousands of Chinook to survive this interception fishery and migrate though Alaska. Many of these migrating Chinook (destined for rivers in British Columbia and the lower United States states) will pass through the feeding grounds of Southern Resident killer whales on their migration to natal rivers. BC's domestic fishing constraints, combined with the catch limits set under the Pacific Salmon Commission, should ensure that the increases in south migrating Chinook liberated from the Alaskan troll fishery will pass through northern BC to reach feeding grounds of SRKW in southern BC.

C. Canadian Fishing Regulations Show the Reasonableness of the District Court's Partial Vacatur Order.

Applying the best available science to threat reduction measures, Canada has taken difficult, yet important steps to address the impacts of declining prey abundance, as well as the impacts from vessel noise and disturbance, in SRKW critical habitat. *See, e.g.,* 2-SER-349, 357–59, 365–74. These efforts include:

- Canadian recreational fishing restrictions on Chinook salmon implemented through time and area closures that support prey rebuilding throughout critical habitat, and

- Seasonal recreational fishing closures to reduce prey competition, noise and disturbance. *Id.*

In addition to these efforts on prey, Canada has also implemented measures to reduce vessel noise and disturbance that interferes with successful foraging and feeding of these endangered whales, including:

- A network of killer whale sanctuaries where Southern Residents can feed without immediate noise and disturbance from vessel traffic,
- Implemented extensive restrictions to whale watching vessels viewing and operating in the vicinity of Southern Residents, and
- Implemented commercial freighter slowdowns on shipping lanes through the priority feeding areas of Southern Residents beginning at the entrance to Juan de Fuca Strait. *Id.*

In addition to efforts to constrain fisheries for killer whales, Chinook fisheries in British Columbia are constrained by the low abundance of domestic populations of threatened and endangered Chinook. Rebuilding efforts for endangered Fraser River Chinook populations include delays to the opening of commercial troll fisheries operating under the Pacific Salmon Treaty, as well as other time and area closures of sport and commercial fisheries to protect at-risk Chinook populations. 2-SER-371.

Finally, the Canadian government is paying to retire Chinook salmon commercial fishing permits. *See* 2-SER-358.

That Canada—the United States' partner in the Pacific Salmon Treaty—imposes several restraints on its own Chinook fisheries and several other commercial activities to conserve killer whales supports the reasonableness of the District Court's decision to impose a partial restriction on a minor component of the SEAK fishery.

III. The Hatchery Program Should Be Vacated

A. NMFS's "prey increase" hatchery program is likely to hinder, not help, Southern Resident killer whales.

NMFS' has stated its position that it can avoid jeopardy to Southern Resident killer whales in the SEAK troll fisheries by mitigating the prey removal with state hatchery programs, particularly WDFW's initiative in Puget Sound. However, there is no evidence that increased production of hatchery Chinook in Puget Sound and elsewhere has aided the recovery of Southern Resident killer whales. Further, a growing body of evidence indicates that production of hatchery Chinook is harmful to the recovery of both ESA-listed and Canadian COSEWIC listed wild Chinook, which consequently hinders the recovery of endangered killer whales.[28]

[28] *See* Hanson *et al.* (2010) supra, at 79 (showing early concern).

As stated earlier, SRKW are highly specialized predators that feed primarily on Chinook salmon. This specialization is further targeted to older and larger age and size classes, preferentially selecting for Chinook four and five years or older with corresponding body sizes greater than 740 mm (29 inches fork length)[29] and body masses greater than 17 pounds.[30] These studies have consistently found that SRKW disproportionately consume 4- and 5-year-old Chinook salmon relative to their abundance.[31] Four- and 5-year-old fish comprise 85% of SRKW diet yet make up only 15% of the Chinook abundance within NOAA's FRAM model. [32]

While it might appear logical that hatchery production would alleviate pressure on wild salmon and assist whales with food supply, this has proven not to be the case. Over the decades that hatcheries have operated, they have failed to restore the abundance, older ages, larger sizes, the broad range of migration times, and diversity of wild Chinook salmon that Southern Residents evolved to rely on. Instead, there is strong evidence that hatcheries are part of the reason wild Chinook have failed to recover. Hatcheries have contributed to overfishing of less productive

[29] Ford and Ellis, (2006), supra.
[30] *Id.*
[31] Hilborn *et al*. (2012), supra, at 17.
[32] E. Ward *et al*., Modeling killer whale prey size selection based upon available data. Northwest Fisheries Science Center, (2010).

wild and endangered populations,[33] the domesticated genes of hatchery-origin fish have mixed with those of wild populations on spawning grounds thereby reducing the reproductive fitness of the population,[34] and an excess of hatchery-origin fish have exacerbated competition with wild fish in food-limited environments.[35] Hatcheries and hatchery-origin salmon ultimately perpetuated the decline of wild Chinook.[36,37,38,39]

Further, the average age of returning hatchery fish in the Columbia River is below the age of four, having declined from 4.13 years in the 1970s to 3.75 years

[33] N.J. Gayeski *et al.*, The failure of wild salmon management: need for a place-based conceptual foundation. 43 Fisheries 7:303-309 (2018).
[34] G.S. Brown *et al.* Pre-COSEWIC review of Southern British Columbia Chinook salmon (*Oncorhynchus tshawytscha*) Conservation Units, Part 1 Background CSAS Research Document 2019/011 at 24, (2019). https://waves-vagues.dfo-mpo.gc.ca/library-bibliotheque/40880321.pdf
[35] Brown *et al.* (2019), supra, at 25.
[36] Gayeski *et al.*, (2018), supra, at 306.
[37] K. Naish *et al.*, An Evaluation of the effects of conservation and fishery enhancement hatcheries on wild populations of salmon, 53 Advances Mar. Biol. 61-194 (2007).
[38] R. Hilborn, Hatcheries and the future of salmon in the Northwest. 17(1) Fisheries 5-8 (1992).
[39] Hatchery Scientific Review Group (HSRG), A. Appleby *et al.*, On the Science of Hatcheries: An updated perspective on the role of hatcheries in salmon and steelhead management in the Pacific Northwest, rev. October 2014, https://www.streamnet.org/app/hsrg/docs/On-the-Science-of-Hatcheries_HSRG_Revised-Oct-2014[1].pdf (2014).

today.[40] In Puget Sound, the average age of a returning hatchery fish is now just under 3 years old with an average length of 623 mm (Figure 1, Table 1). This is a decline from 726 mm in the 1970s. More importantly, in the 1970s, 63% of Chinook from Puget Sound hatcheries were above the selectivity point (740 mm) of Southern Resident killer whales. Today, less than 20% are above 740 mm, meaning that most hatchery Chinook coming out of Puget Sound would not be consumed by Southern Residents (Figure 1). At this lower end of the SRKW selectivity curve for the age and size of Chinook, the average Puget Sound hatchery fish would represent an extremely low percentage of their diet.

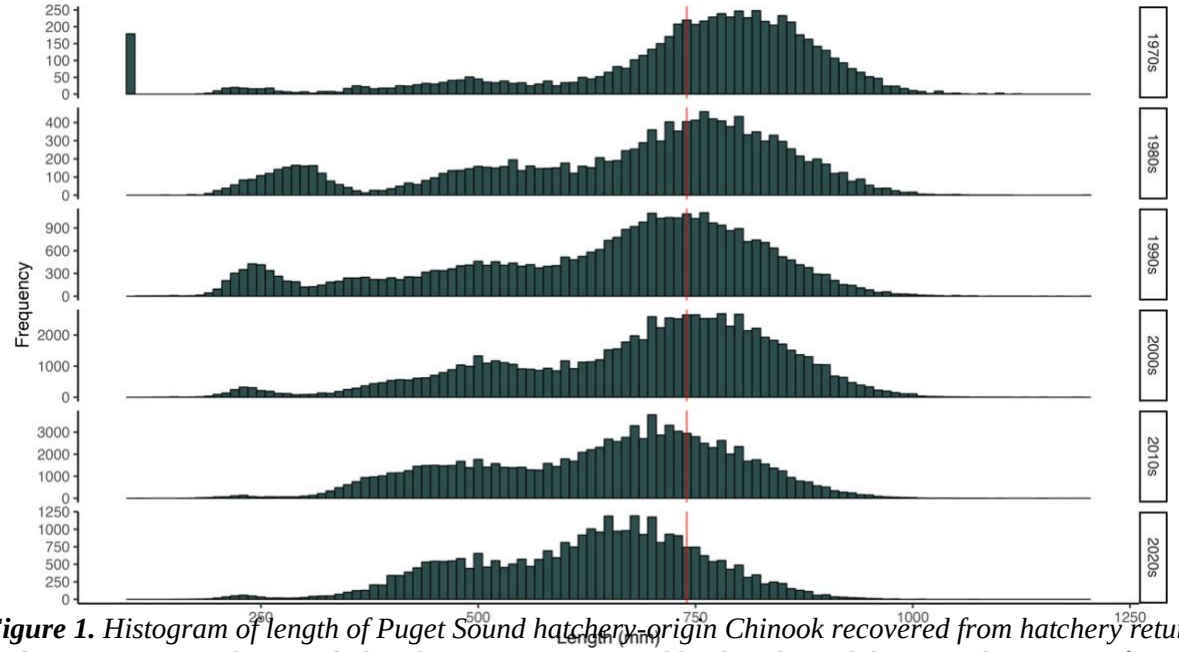

Figure 1. *Histogram of length of Puget Sound hatchery-origin Chinook recovered from hatchery returns and spawning grounds. Length distributions are presented by decade, and the size selectivity preference of Southern Resident Killer Whales (740mm) is indicated by the red vertical lines. N = 273, 970. Data Source: Regional Mark Processing Center, Regional Mark Information System (RMIS), releases from hatcheries in North, Mid, and South Puget Sound, 1973-2022.*

[40] Tipping and Wickersham, The demise of the kings. https://www.joincca.org/demise-of-the-kings/ (2021).

Decade	Mean length (mm) of mature Puget Sound hatchery Chinook	Standard error on length	Proportion of mature Puget Sound hatchery Chinook above 740 mm	Mean age of mature Puget Sound hatchery Chinook	Standard error on age
1970s	726	2.29	0.627	3.24	0.0100
1980s	663	1.61	0.449	2.96	0.00831
1990s	638	0.969	0.358	3.12	0.00496
2000s	685	0.550	0.449	3.23	0.00281
2010s	642	0.463	0.295	3.07	0.00245
2020s	623	0.745	0.197	2.96	0.00409

Table 1. *The average length (n=273,970), standard error of average length, proportion, average age (n=276,048) and standard error of average age, for mature Puget Sound hatchery-origin Chinook, presented by decade. Mature Chinook are recovered from hatchery returns and spawning grounds. Data Source: Regional Mark Processing Center, Regional Mark Information System (RMIS), releases from hatcheries in North, Mid, and South Puget Sound, 1973-2022.*

Most hatchery Chinook are also the life history type that return in the fall. Nutritional stress from limited foraging opportunities in the winter and early spring has been postulated as a reason for the poor body condition observed in Southern Residents before summer.[41]

[41] Stewart *et al.* (2021) supra, at 15.

Recovery of Southern Residents requires restoring not just abundance, but the historic age structure of wild Chinook salmon. This is not the goal of hatcheries, nor fisheries management. Hatcheries are focused on producing fish for the economic and social objectives of fisheries harvest.

B. Hatcheries inhibit the recovery of wild Chinook salmon.

Because fisheries do not harvest all hatchery Chinook they produce, and killer whales are not selectively foraging for them, the numbers of uncaught hatchery Chinook returning to Washington and other areas means these fish stray onto the spawning grounds of wild salmon. This drives down the biological fitness (productivity) of wild populations, further delaying or even preventing, Chinook recovery. Even below the current levels of hatchery production in Washington State, the proportion of hatchery origin Chinook (pHOS; percent hatchery origin spawners) on wild salmon spawning grounds in most Washington rivers exceeds "biologically acceptable" levels recommended by the independent Hatchery Scientific Review Group.[42] This is especially true in Puget Sound. Increasing Chinook hatchery production simply results in further increases in pHOS levels, thereby imposing further harm to the productivity of wild Chinook populations.

Continuing to focus on a conjectural hatchery solution as mitigation that has not proven successful to date, perpetuates the shortcomings of industrial fisheries

[42] HSRG, Appleby et al. (2014), supra.

management and its consequences for both endangered Southern Resident killer whales and endangered wild Chinook salmon. This approach simply continues a model of salmon management that fails to recognize that Chinook diversity and abundance is rooted in their strong attachment to, and evolution in, their spawning rivers of origin.[43] Reliance on industrial hatcheries as a tool to address the ecological issues facing Southern Resident killer whales and wild Chinook will continue to fail both of them.

CONCLUSION

There is inadequate evidence for NMFS's claim that hatchery produced Chinook salmon from Puget Sound and other state hatcheries can mitigate for the reduced passage of salmon through SEAK that is intercepted by the troll fishery. Further, knowledge of killer whale diet and selectivity indicates that most Puget Sound hatchery Chinook are failing to provide Southern Resident killer whales with a functional food source. Solutions to problems of endangered whales, endangered Chinook, and declining size and age of Chinook, do not require closing all Chinook fisheries, they require moving these fisheries. While not without hardship, relocating Chinook fisheries to terminal areas near their rivers of origin is a solution that supports rebuilding and recovery, while still allowing fisheries to occur. Relocating Chinook fisheries from west coast rearing grounds and migration routes would assist

[43] Gayeski *et al.*, (2018) supra, at 303-309.

rebuilding of abundance, as well as size and age of wild Chinook. Recovering abundance, size and age of Chinook, would advance the recovery of endangered Southern Resident killer whales.

Respectfully submitted this 6th day of December 2023.

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CERTIFICATE OF COMPLIANCE

9th Cir. Case Number(s) 23-35322, 23-35323, 23-35324, 23-35354

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