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# Free Willy: A Breach to Rejuvenate the Southern Resident Killer Whale

*Luke McDonough*<sup>†</sup>

## I. INTRODUCTION

The killer whale has long been an iconic, magnificent creature of the Pacific Northwest. Killer whales, or “orcas,” are found in all oceans, but the Pacific Northwest is home and most well-known for an individual ecotype: the Southern Resident Killer Whale (“Southern Resident” or “SRKW”).<sup>1</sup> The Southern Resident Killer Whale can be clearly identified by its distinctive black-and-white color pattern.<sup>2</sup> Each individual whale can be classified through their unique dorsal fin, carrying a certain scarring and shape and accompanied by a patch of white or black color behind it, known as a “saddle” patch.<sup>3</sup>

Researchers and scientists determined that the SRKWs population consists of three separate families, known as “pods” – J, K, and L pod, respectively.<sup>4</sup> As of December 31, 2020, J pod has 24 whales and is commonly seen in and around the San Juan Islands and Puget Sound; K pod has 17 whales and often spends time off the Washington coast during the winter; and L pod has 33 whales that travel throughout the Salish Sea (Puget Sound, San Juan Islands, and Georgia Strait).<sup>5</sup> Scientists estimate that the minimum historical population of the SRKWs was at least 140

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<sup>†</sup> Luke McDonough is a student at Seattle University School of Law and graduates with his Juris Doctorate in May 2021. Mr. McDonough has always felt strongly about issues of conservation and the protection of natural habitats. He would like to acknowledge the work the SJTEIL editors and staff committed to supporting this article, as well as the support he has received from friends and family throughout law school.

<sup>1</sup>*Killer Whale*, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION (NOAA) FISHERIES (Sept. 20, 2019), [https://archive.fisheries.noaa.gov/wcr/protected\\_species/marine\\_mammals/killer\\_whale/index.html](https://archive.fisheries.noaa.gov/wcr/protected_species/marine_mammals/killer_whale/index.html) [https://perma.cc/V9Q8-E38X].

<sup>2</sup>*Recovery Plan for Southern Resident Killer Whales (Orcinus Orca)*, NATIONAL MARINE FISHERIES SERVICE II-3 (Jan. 17, 2008), [https://archive.fisheries.noaa.gov/wcr/publications/protected\\_species/marine\\_mammals/killer\\_whales/esa\\_status/srkw-recov-plan.pdf](https://archive.fisheries.noaa.gov/wcr/publications/protected_species/marine_mammals/killer_whales/esa_status/srkw-recov-plan.pdf) [https://perma.cc/2D82-TU68] [hereinafter “Recovery Plan”].

<sup>3</sup> *Id.*

<sup>4</sup> *Southern Resident Killer Whale Population*, CENTER FOR WHALE RESEARCH (Feb. 14, 2021), <https://www.whaleresearch.com/orca-population> [https://perma.cc/F98Y-TM97].

<sup>5</sup> *Id.*

whales.<sup>6</sup> Researchers and scientists did not formally record the SRKW population until noting a steep, immediate decline resulting from the live-capture of orcas for marine parks in the late-1960s.<sup>7</sup> Between 1962-1976, over 270 killer whales were captured in the Pacific Northwest, with more than 50 whales trapped for display and at least 12 dying during capture.<sup>8</sup> Since the ban on commercial capture in Washington state in 1976, scientists have seen a fluctuation in the SRKWs' population, demonstrating a growth period spiking to 98 animals in 1995, before undergoing another steady decline reaching 80 animals in 2001.<sup>9</sup>

The entire Pacific Northwest region became acutely aware of the seriousness of the problems facing the Southern Residents' population when a mother orca, Tahlequah, carried her stillborn calf for 17 days in the summer of 2018, popping in and out of view from above the water, following her calf's death.<sup>10</sup> This display of emotion captured SRKWs in a light previously unseen and was carried across nightly news, captivating the country's attention.<sup>11</sup> With newfound civic engagement on the issue, there is hope that adequate systems are being organized to respond to the issues that this animal has been facing for decades.<sup>12</sup>

Government and commercial actors agree that the three major threats to SRKWs' viability are prey availability, vessel traffic and noise, and toxic contaminants.<sup>13</sup> While SRKWs have nearly always faced these issues, there is a growing concern about the amount being done to the entire ecological system they live in due to major increases in human activity and overutilization of resources.<sup>14</sup>

State and federal government entities have performed meaningful action to regulate and protect the SRKWs' population. However, this species is still confronted with unprecedented population levels, frequent loss

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<sup>6</sup> *Southern Resident Killer Whales: 10 Years of Research & Conservation*, NOAA FISHERIES 5 (June 2014), [https://www.nwfsc.noaa.gov/news/features/killer\\_whale\\_report/pdfs/bigreport62514.pdf](https://www.nwfsc.noaa.gov/news/features/killer_whale_report/pdfs/bigreport62514.pdf) [<https://perma.cc/V792-MAJL>].

<sup>7</sup> *Id.*

<sup>8</sup> Lynda V. Mapes, *The Orca and the Orca Catcher: How a Generation of Killer Whales was Taken from Puget Sound*, THE SEATTLE TIMES, Dec. 13, 2018, <https://www.seattletimes.com/seattle-news/environment/the-orca-and-the-orca-catcher-how-a-generation-of-killer-whales-was-taken-from-puget-sound/> [<https://perma.cc/XF32-TG23>].

<sup>9</sup> *Id.*

<sup>10</sup> Avi Selk, *Update: Orca abandons body of her dead calf after a heartbreaking, weeks-long journey*, WASHINGTON POST, Aug. 12, 2018, <https://www.washingtonpost.com/news/animalia/wp/2018/08/10/the-stunning-devastating-weeks-long-journey-of-an-orca-and-her-dead-calf/> [<https://perma.cc/D2MZ-PRTY>].

<sup>11</sup> *Id.*

<sup>12</sup> Inslee, EO 18-02, *Southern Resident Killer Whale Recovery and Task Force*, [https://www.governor.wa.gov/sites/default/files/exe\\_order/eo\\_18-02\\_1.pdf](https://www.governor.wa.gov/sites/default/files/exe_order/eo_18-02_1.pdf) [<https://perma.cc/NZB7-PXWC>].

<sup>13</sup> *Saving the Southern Residents: Turning the Tide for the West Coast's Beloved Killer Whales*, NOAA, <https://noaa.maps.arcgis.com/apps/Cascade/index.html?appid=3405e6637bf74e998d4ebe992c54f613> [<https://perma.cc/Y282-YKAE>]; Recovery Plan, *supra* note 2, at iv-v; Southern Resident Killer Whales, *supra* note 6, at 7.

<sup>14</sup> Recovery Plan, *supra* note 2 at II-72-II-74.

of newborn calves, and the dwindling of reproductively active members.<sup>15</sup> While government plans have laid forth numerous detailed analyses of variables and factors affecting the Southern Resident population and other talking points, these animals need concrete, material solutions to protect their future and ensure their viability for generations to come.<sup>16</sup>

Consensus reveals prey availability as the largest concern to the long-term recovery and conservation of the SRKWs' population.<sup>17</sup> Salmon, particularly Chinook salmon, make up the overwhelming majority of the Southern Residents' diet as they travel the Salish Sea in the late summer and early fall each year.<sup>18</sup> To ensure the availability of salmon in these waters, the Washington State legislature must address the ecological damage caused by dams, particularly on the Columbia River and Lower Snake River Basin. Dams require an extensive system of alternate structures to allow for passage and return of native fish and disrupt what would otherwise be free-flowing rivers.<sup>19</sup> Legal challenges to existing dam operating structure have made some progress in the development and utilization of resources going towards environmental protection.<sup>20</sup> For decades, the incremental progress achieved has not kept up with amount of variability and change to the overall ecosystem. Nonetheless, these legal challenges have revealed a way to move forward against the dams' current operating structure.

Despite incremental progress, the three branches of the Washington state government must act boldly to further protections for the SRKWs. The executive branch should issue orders directing funds to areas in support of SRKWs and mandate additional critical habitat. The legislative branch should pass additional statutes and regulations sanctioning interference with SRKWs as well as propose new environmental and ecological measures to support the SRKWs. Lastly, the judicial branch must be utilized, with or without broad public support, through progressive courts to encourage the federal legislature to breach the Lower Snake River dams. These combined efforts of government action will help revitalize the endangered salmon populations, restore the natural ecosystem, and provide an abundance of natural, healthy, wild-born prey for SRKWs.

This paper will address the past, present, and future viability of the SRKW population. Section II examines the current protections enacted

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<sup>15</sup> *Id.* at IV-8.

<sup>16</sup> Saving the Southern Residents, *supra* note 13.

<sup>17</sup> *Id.*

<sup>18</sup> Recovery Plan, *supra* note 2, at II-17.

<sup>19</sup> *Fish Passage at Dams*, NORTHWEST POWER AND CONSERVATION COUNCIL (Feb. 16, 2021), <https://www.nwccouncil.org/reports/columbia-river-history/fishpassage> [<https://perma.cc/EAV7-CDR5>].

<sup>20</sup> Renee Cho, *Removing Dams and Restoring Rivers*, COLUMBIA UNIVERSITY: EARTH INSTITUTE (Aug. 29, 2011), <https://blogs.ei.columbia.edu/2011/08/29/removing-dams-and-restoring-rivers/> [<https://perma.cc/V8WL-H78L>].

by the federal government and the state of Washington to protect SRKWs, their waters, and their resources. Section III then examines the most dangerous threats facing the SRKW population today as well as other potential deadly harms. Lastly, Section IV proposes solutions to contain and reverse the most pressing threats SRKWs face.

## II. CURRENT PROTECTIONS

Since the round-up and capture of killer whales for commercial usage in marine parks and public recognition of their population decline, the government began to research the animal more broadly using field studies and annual reports.<sup>21</sup> SRKWs can likely attribute their lack of protections in the early years of the environmental movement to the fact that little recorded evidence of their lives or habits existed, and that most public interaction with the creatures was through parks such as SeaWorld.

### A. Federal Protections

The two primary pieces of federal legislation invoked to protect SRKW are the Marine Mammal Protection Act of 1972 and Endangered Species Act.

The Marine Mammal Protection Act of 1972 (MMPA) was the first federal legislation that delegated an ecosystem wide approach to the protection and conservation of marine resources.<sup>22</sup> However, the legislation did not apply with full force to SRKWs until 2003, when the National Marine Fisheries Service (NMFS) listed SRKWs as “depleted” under the MMPA, according them greater protections and entitling the species to a conservation plan to reverse the decline in population.<sup>23</sup> Under the MMPA in 2011, the National Oceanic and Atmospheric Agency (NOAA), Department of Commerce (DOC), and NMFS promulgated a rule prohibiting vessels from approaching killer whales within 200 yards and from positioning in the path of whales when in the inland waters of Washington state.<sup>24</sup> The MMPA, however, may grant an exception or permit for the government and other authorized actors to protect the animals from excessive vessel noise and traffic.<sup>25</sup>

The Endangered Species Act (ESA) provides even more critical protections for SRKWs. The purpose of the ESA is to ensure that the actions or authorizations of federal agencies are not likely to “jeopardize the

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<sup>21</sup> Southern Resident Killer Whales, *supra* note 6.

<sup>22</sup> *Marine Mammal Protection Act*, MARINE MAMMAL COMMISSION, <https://www.mmc.gov/about-the-commission/our-mission/marine-mammal-protection-act/> [<https://perma.cc/42PL-JJ4C>].

<sup>23</sup> 68 Fed. Reg. 31980 (June 30, 2003). 50 CFR 216, available at <https://www.federalregister.gov/documents/2003/05/29/03-13421/regulations-governing-the-taking-and-importing-of-marine-mammals-eastern-north-pacific-southern>

<sup>24</sup> 76 FR 20870 (2011). [govinfo.gov/app/details/FR-2011-04-14/2011-9034](http://govinfo.gov/app/details/FR-2011-04-14/2011-9034)

<sup>25</sup> 76 FR 20870 (2011).

continued existence of any listed species or result in the destruction or adverse modification of designated critical habitat of such species.”<sup>26</sup> Initially, it was determined that recognition under the ESA was “not warranted” because SRKWs did not fit under the required “distinct population segment” criteria.<sup>27</sup> This decision was challenged in 2003 in a U.S. District Court in Seattle and remanded for consideration.<sup>28</sup> While that challenge progressed for reconsideration, SRKWs were recognized as a “depleted” species under the ESA in 2003.<sup>29</sup> Ultimately, SKRWs were listed as “endangered” in late 2005, where the species remains categorized.<sup>30</sup> As part of SRKWs’ “endangered” designation, NOAA, DOC, and NMFS promulgated a rule designating the following area as “critical habitat” under ESA §4: (1) the Summer Core Area in Haro Strait and waters around the San Juan Islands; (2) Puget Sound; and (3) the Strait of Juan de Fuca (in total approximately 2,560 square miles (6,630 square kilometers) of marine habitat).<sup>31</sup> Section 7(a)(2) of the ESA requires that after a critical habitat has been designated, every federal agency involved must “ensure that any action it authorizes, funds, or carries out is not likely to result in the destruction or adverse modification of critical habitat.”<sup>32</sup> In addition, the Secretary of the Interior is required to review all “endangered” species to determine whether they be downgraded to “threatened” or removed from the ESA’s protections entirely.<sup>33</sup>

Even with these federal protections, the SRKW population shrunk from 88 animals in 2005 to the low-to-mid 70s in the late 2010s.<sup>34</sup> In response, federal agencies have worked collectively to analyze the issues and evaluate possible solutions to set the SRKWs on a path to recovery and conservation. Some of the government’s most important work in this regard is its Columbia River System Biological Opinion reviews. These Biological Opinions (BiOps) assess the impact throughout the Columbia River System (CRS) ecological system on any significant proposed action that could affect the area’s endangered wildlife and are conducted by NOAA, under direction from the DOC pursuant to Section 7 of the ESA, in cooperation with three other federal agencies that have oversight over the CRS, the Bonneville Power Administration (BPA), the U.S. Army

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<sup>26</sup> *Summary of the Endangered Species Act*, ENVIRONMENTAL PROTECTION AGENCY, <https://www.epa.gov/laws-regulations/summary-endangered-species-act> [<https://perma.cc/C9XJ-TYV4>].

<sup>27</sup> Recovery Plan, *supra* note 2, at II-67.

<sup>28</sup> *Id.* (environmental groups challenged the decision that SRKW did not fit the ESA criteria according to National Marine Fisheries Service assessments and the court held that a re-evaluation had to be conducted, including new information).

<sup>29</sup> 68 FR 31980 (2003) available at <https://www.govinfo.gov/app/details/FR-2003-05-29/03-13421>.

<sup>30</sup> 70 FR 69903 (2005) available at <https://www.govinfo.gov/app/details/FR-2005-11-18/05-22859>.

<sup>31</sup> 71 FR 69054 (2006) available at <https://www.govinfo.gov/app/details/FR-2006-11-29/06-9453>.

<sup>32</sup> *Id.*

<sup>33</sup> 16 U.S.C. §1533(c)(2)(A) (1973).

<sup>34</sup> Sothern Resident Killer Whale Population, *supra* note 4.

Corps of Engineers (the “Corps”), and the Bureau of Reclamation (BOR).<sup>35</sup>

### B. Washington State Protections

Washington state has a direct interest in ensuring SRKW safety and protection. In 1976, Washington filed suit against SeaWorld to challenge the park’s capture activities in Budd Inlet, eventually reaching a settlement where no killer whales would be captured in Washington waters ever again.<sup>36</sup> This ultimately made the Budd Inlet raid the last killer whale raid in any United States jurisdiction.<sup>37</sup> Since Washington banned outright orca capture, the state has sought to advance the animal’s long-term viability in other significant ways, including coordinating with federal agencies to designate protected waters and limiting whale-to-vessel contact.<sup>38</sup>

Following a loss of 18 whales between 1996 and 2001, and in conjunction with a greater understanding of the comprehensive threats jeopardizing these animals’ long-term viability, Washington state adopted the position of its Department of Fish and Wildlife (WDFW) agency, determining that the SRKW should be designated an endangered species.<sup>39</sup> The state’s “endangered” designation directs special management attention and priority to recover the species in Washington and directs the WDFW to work with other state and federal agencies on conservation strategies for killer whales.<sup>40</sup>

Under this designation, there were greater penalties for attempting to harass the species;<sup>41</sup> however, in 2008, the state legislature passed a statute based solely for the protection of SRKW, noting their importance to the state, their designation as the state’s official marine mammal, and the realities of their serious population decline.<sup>42</sup> This protection expanded from its initial measure of protecting SRKW from immediate vessel noise

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<sup>35</sup> *Endangered Species Act Section 7(a)(2) Biological Opinion*, NATIONAL MARINE FISHERIES SERVICE (Mar. 29, 2019), [https://archive.fisheries.noaa.gov/wcr/publications/hydropower/fcrps/master\\_2019\\_crs\\_biological\\_opinion\\_\\_1\\_.pdf](https://archive.fisheries.noaa.gov/wcr/publications/hydropower/fcrps/master_2019_crs_biological_opinion__1_.pdf) [<https://perma.cc/9ST2-WFCD>] [hereinafter “CRS BiOp”].

<sup>36</sup> Mapes, *supra* note 8.

<sup>37</sup> *Id.* (An aide to then Governor Evans was on a sailing trip in those waters witnessed a crew pursuing orcas for capture using techniques such as lighting explosives above and under water, chasing the orcas in speed boats, and trapping the escaping whales in nets, all resulting in high shrieks from the animals and a calamitous scene; when the issue was brought to Governor Evans, he instituted immediate legal action to halt all further orca trapping).

<sup>38</sup> WASH. REV. CODE § 77.15.740 [2008 c 225 §1] (1998).

<sup>39</sup> Gary J. Whiles, *Washington State Status Report for the Killer Whale*, WASH. DEP’T OF FISH AND WILDLIFE PROGRAM (Nov. 2003), at 83, <https://wdfw.wa.gov/sites/default/files/publications/00381/wdfw00381.pdf> [<https://perma.cc/B5YW-EX7K>].

<sup>40</sup> *Killer Whale (Orca) Conservation and Management*, WASH. DEP’T OF FISH AND WILDLIFE, <https://wdfw.wa.gov/species-habitats/at-risk/species-recovery/orca> [<https://perma.cc/8QA3-SV2C>].

<sup>41</sup> WASH. REV. CODE § 77.15.120 (1998).

<sup>42</sup> *Id.* § 77.15.740 [2008 c 225 §1] (1998).

and educating the public on the issue to continually expanding the range of protected and critical area to further the safety of the SRKW.<sup>43</sup>

Governors have also acted through executive powers when there may be a lack of public support or interest in a certain area to protect SRKWs. Former Governor Dan Evans, with the encouragement of then-Secretary of State Ralph Munro, led the charge against SeaWorld to obtain a temporary restraining order and, ultimately, a permanent injunction against orca capture in Washington waters.<sup>44</sup> In March 2018, Governor Jay Inslee convened a “Southern Resident Killer Whale Task Force” to work with state agencies and the legislature to address the recovery and conservation of the Pacific Northwest’s symbolic creature.<sup>45</sup> The task force was set out to study, address, and file a report on the three major threats—contaminants, vessel noise, and prey availability—facing SRKW and to “identify, prioritize, and support the implementation of a longer term action plan needed for the recovery of Southern Residents and necessary to secure a healthy and sustained population for the future.”<sup>46</sup> The task force’s latest report defined near-term criteria for recovery that includes evidence of consistently well-nourished whales, more live births and the survival of several thriving young orcas, with the ultimate goal of “10 more whales in 10 years.”<sup>47</sup>

### III. ON-GOING AND FUTURE THREATS

#### A. *Three Major Threats*

The three major threats SRKWs currently face are prey availability, vessel traffic and noise, and contaminants—all of which are commonly acknowledged by industry, tribal nations, and governments.<sup>48</sup> These threats have been conceded since the government first recognized the SRKW as a threatened species, yet the dangers have lingered.<sup>49</sup>

#### 1. Prey Availability

Prey availability is regarded as the most significant and challenging current and long-term threat to the SRKWs.<sup>50</sup> Through analysis of SRKW fecal matter, scientists discovered that their diet consists of nearly

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<sup>43</sup> *Id.*

<sup>44</sup> Mapes, *supra* note 8.

<sup>45</sup> Inslee, *supra* note 12, at 2-3.

<sup>46</sup> *Id.* at 3.

<sup>47</sup> *DRAFT Year 2 Report and Recommendations*, SOUTHERN RESIDENT ORCA TASK FORCE (Oct. 2019), at 5, [https://www.governor.wa.gov/sites/default/files/YR2Report\\_DRAFT\\_V8.pdf](https://www.governor.wa.gov/sites/default/files/YR2Report_DRAFT_V8.pdf) [<https://perma.cc/X2ZW-FP83>]. [hereinafter “Southern Resident Orca Task Force”].

<sup>48</sup> *Saving the Southern Residents*, *supra* note 13.

<sup>49</sup> *Recovery Plan*, *supra* note 2.

<sup>50</sup> *Recovery Plan*, *supra* note 2, at II-86–87.



98% salmon, with roughly 80% of that salmon being Chinook.<sup>51</sup> SRKW's preference for Chinook salmon over other salmon or potential sources of prey comes from the Chinook's abundance in the Salish Sea during SRKW's migratory period, their large size, and their high fat and energy content.<sup>52</sup> Studies of SRKW's have shown the whales to consume Chinook salmon nearly exclusively, even while the Chinook population decreases and other Salmon species—such as Sockeye and Coho—outperform expected returns.<sup>53</sup> Unfortunately for SRKW's, evidence shows they are picky eaters who do not consume salmon species in proportion to their abundance.<sup>54</sup>

While the underabundance of Chinook salmon may be detrimental to SRKW's, there is progress in addressing some of the root issues. NOAA listed Chinook salmon in the Columbia River Basin a “threatened” and “endangered” species, dependent upon the spawning season of the run of salmon.<sup>55</sup> The federal government estimated that Chinook salmon in the Lower Snake River had an annual return of 408,500 to 536,180 adult fall Chinook salmon in the late 1800s but dropped significantly with the construction of each dam along the Columbia and Snake Rivers.<sup>56</sup> From the 1970s to the 1990s, annual adult fall Chinook salmon returns averaged in the hundreds.<sup>57</sup> In response to these horrific statistics, incredible sums of money were devoted to hatcheries and to modification of dams to increase passage rates, which in turn improved return rates significantly.<sup>58</sup> A decade of estimates from 2005-2014 show that over 50,000 adult Chinook return to the Snake River every year; however, only 6,000 of these Chinook are natural, wild-born salmon.<sup>59</sup> No direct correlation between Chinook salmon stock and SRKW population exists, but the greater the abundance of prey, the greater likelihood the SRKW will be a healthier species.

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<sup>51</sup> Michael Ford, *et al.*, *Estimation of a Killer Whale (*Orcinus orca*) Population's Diet Using Sequencing Analysis of DNA from Feces*, PLOS ONE (2016), <https://doi.org/10.1371/journal.pone.0144956> [<https://perma.cc/LMA8-96UP>].

<sup>52</sup> Whiles, *supra* note 39, at 15.

<sup>53</sup> Ford, *supra* note 51.

<sup>54</sup> *Id.*

<sup>55</sup> *Chinook Salmon – Protected*, NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION, <https://www.fisheries.noaa.gov/species/chinook-salmon-protected#overview> [<https://perma.cc/JZN4-ZG9U>].

<sup>56</sup> *ESA Recovery Plan for Snake River Fall Chinook Salmon (*Oncorhynchus tshawytscha*)*, NATIONAL OCEANIC AND ATMOSPHERIC AGENCY AND NATIONAL MARINE FISHERIES SERVICE (Nov. 2017), at 26, [https://archive.fisheries.noaa.gov/wcr/publications/recovery\\_planning/salmon\\_steelhead/domains/interior\\_columbia/snake/Final%20Snake%20Recovery%20Plan%20Docs/final\\_snake\\_river\\_fall\\_chinook\\_salmon\\_recovery\\_plan.pdf](https://archive.fisheries.noaa.gov/wcr/publications/recovery_planning/salmon_steelhead/domains/interior_columbia/snake/Final%20Snake%20Recovery%20Plan%20Docs/final_snake_river_fall_chinook_salmon_recovery_plan.pdf) [<https://perma.cc/U2D6-ET4Y>] ([hereinafter “ESA Recovery Plan”]).

<sup>57</sup> *Id.* at 72.

<sup>58</sup> *Id.* at 100.

<sup>59</sup> *Id.* at 35.

Experts speculate that the majority of recent stillborn orca calves reflects the inadequate diet and malnourishment of the pod.<sup>60</sup>

As with the SRKW, the Chinook salmon's ESA designation requires NOAA and NMFS to conduct a review within every five years of listing and to create a comprehensive recovery strategy plan for the species.<sup>61</sup> While recognizing the level of depletion Chinook salmon have experienced throughout the Columbia River Basin, NOAA concluded that the species was at "low" risk of extinction with multiple paths towards self-sustainability in the Lower Snake River.<sup>62</sup> A major contributing factor for this conclusion was the role that hatcheries play in the overall production and management of the salmon ecosystem.<sup>63</sup> Hatcheries supplement natural, wild-born salmon with large numbers of farmed-fish which are injected into the ecosystem, thus increasing the overall number of Chinook; however, these actions have consequences which have not been fully studied.<sup>64</sup> For instance, an ecological system's reliance on hatchery-raised fish can jeopardize the natural, wild-born fish reproduction rates and diversity through intermingling with a genetically uniform, cultivated, and commonly inbred species.<sup>65</sup> A concern for the SRKWs is that hatchery-raised Chinook tend to be smaller, less fatty, and less intelligent, meaning that though the orcas expend less energy on their hunts to capture hatchery fish, they, in return, receive less nutritional value.<sup>66</sup> Nonetheless, salmon hatcheries must contribute and continue to play a factor in salmon recovery as they have a significant role in our economy, the species' ecosystem, and a proper balance must be maintained to encourage the reproduction of natural, wild-born salmon.

The lifecycle of Chinook salmon is grueling, filled with challenges, predators, and manmade obstacles that have rendered it more difficult and adverse to its natural instincts. Salmon are anadromous fish, meaning they are born in freshwater, spend most of their lifetime in a salt-water sea or ocean, then return to the freshwater in which they were born

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<sup>60</sup> Samuel K. Wasser *et al.*, *Population Growth Is Limited by Nutritional Impacts on Pregnancy Success in Endangered Southern Resident Killer Whales (Orcinus Orca)*, PLOS ONE (June 29, 2017), <https://doi.org/10.1371/journal.pone.0179824> [<https://perma.cc/RM64-9G2R>].

<sup>61</sup> ESA Recovery Plan, *supra* note 56, at 23.

<sup>62</sup> *Id.* at 34-35.

<sup>63</sup> *Id.* at 36.

<sup>64</sup> *Id.*

<sup>65</sup> MR Christie, *et al.*, *Effective Size of a Wild Salmonid Population Is Greatly Reduced by Hatchery Supplementation*, HEREDITY (July 18, 2012), at 1, [http://people.oregonstate.edu/~blouinm/pdf\\_files/Christie%20et%20al\\_%202012\\_%20Heredity\\_OnlineEarly.pdf](http://people.oregonstate.edu/~blouinm/pdf_files/Christie%20et%20al_%202012_%20Heredity_OnlineEarly.pdf) [<https://perma.cc/ZPQ3-N7JB>].

<sup>66</sup> *Report and Recommendations*, SOUTHERN RESIDENT ORCA TASK FORCE (Nov. 16, 2018), at 15, [https://www.governor.wa.gov/sites/default/files/OrcaTaskForce\\_reportandrecommendations\\_11.16.18.pdf](https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_reportandrecommendations_11.16.18.pdf) [<https://perma.cc/Q86H-BGLW>].

to spawn and die.<sup>67</sup> On the Lower Snake River, juvenile migration downstream after birth of a “smolt” (newborn salmon) would take one-to-two weeks before the construction of the dams.<sup>68</sup> After completion of the eight dams in the Columbia River Basin, it now takes upwards of a month.<sup>69</sup> A group responsible for overseeing recovery in the area, the Northwest Power and Conservation Council, has set a goal of achieving a 4% rate of smolt-to-adult returns (SAR), meaning that out of every 100 smolts to leave the Snake River, four would return.<sup>70</sup> However, the current analyzed rate is less than 2%, which was the goal set for required recovery.<sup>71</sup> The Fish Passage Center recorded counts and found from 1994 to 2012, the SAR for spring-summer run Chinook salmon averaged less than 1% and only exceeded 2% twice during all recordings.<sup>72</sup> Snake River fall Chinook primarily spawn in the mainstem between Lower Granite and Hells Canyon Dam with some spawning in large tributaries as well.<sup>73</sup> Due to the construction of reservoir pools and blocked habitat at Hells Canyon Dam, only 20% of historical Lower Snake River spawning habitat is available.<sup>74</sup> These SAR numbers and limited spawning grounds reflect the reality that current practices are not reliable to produce a self-sustainable salmon population.

The overall issue remains that SRKWs are losing their primary prey, largely as a result of manmade ecological impacts caused by dams and their downstream effects. For illustration, the Hells Canyon Complex Dam and five additional upstream Snake River dams restrict access of up to 367 miles in the Middle Snake River.<sup>75</sup> When the dams were initially constructed over 50 years ago, the level of salmon returning to the area decreased dramatically and has still not recovered.<sup>76</sup> Unrestricted, this free-flowing source of water would be invaluable spawning habitat.<sup>77</sup>

There has been some recoument in Lower Snake River Chinook salmon since the early 2000s due to increases in hatchery raised fish, safer passage methods at hydroelectric dams, and other recovery and protection measures. These downstream passage methods include (1) spillways,

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<sup>67</sup> *The Salmon Life Cycle*, NATIONAL PARK SERVICE, <https://www.nps.gov/olym/learn/nature/the-salmon-life-cycle.htm> [<https://perma.cc/PFR9-KT8R>].

<sup>68</sup> Jeremy P. Jacobs, *Time Running Out For Crusading Biologist's War On Dams*, E&E NEWS (Sept. 25, 2019), <https://www.eenews.net/stories/1061166033> [<https://perma.cc/QK2L-F6P8>].

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> *Id.*

<sup>72</sup> *Comparative Survival Study of PIT-tagged Spring/Summer/Fall Chinook, Summer Steelhead, and Sockeye (2014 Annual Report)*, COMPARATIVE SURVIVAL STUDY OVERSIGHT COMMITTEE AND FISH PASSAGE CENTER, (Nov. 2014), at 87, [http://www.fpc.org/documents/CSS/CSS\\_2014\\_Annual\\_Report1a.pdf](http://www.fpc.org/documents/CSS/CSS_2014_Annual_Report1a.pdf) [<https://perma.cc/NPZ5-TGNC>].

<sup>73</sup> ESA Recovery Plan, *supra* note 56, at 24.

<sup>74</sup> *Id.*

<sup>75</sup> *Id.* at 36.

<sup>76</sup> *Id.* at 28.

<sup>77</sup> *Id.*

which are overflows of water the fish can follow over the dam downstream; (2) turbine passages with the assistance of a gatewell (a small, upwards shoot of water within a dam structure) for extra protection; (3) “juvenile bypass systems,” which lift juvenile salmon from upstream, into the dam, then release them onto a conveyer belt across the dammed water source; and (4) “floating surface collectors” that work as nets to streamline the approaching salmon towards dams and distribute them towards safe passage methods through to the other side.<sup>78</sup>

For years, any talk of breaching the dams was considered politically unthinkable.<sup>79</sup> To offset some dam harms, the government has allocated over \$1.3 billion to BPA to implement projects and support alterations to protect salmon and other wildlife.<sup>80</sup> While some incremental improvements have been made, laws should more actively protect the Chinook salmon in the Columbia River Basin and the SRKWs instead of simply affording them a mere right to continued survival. Without any major or structural change, small incremental improvements will only continue to keep these species endangered.

## 2. Vessel Traffic and Noise

The second major threat the SRKWs face is vessel traffic and noise.<sup>81</sup> This includes commercial, private, government, and military ships, as well as low-flying military operations.<sup>82</sup> Vessel noise disrupts killer whales’ ability to use sound to hunt, communicate, and travel in packs.<sup>83</sup> These noise disruptions in turn increase the amount of energy killer whales need to expend in the following activities: communicating with each other using their distinctive clicks, calls, and whistles, echolocating sources of food and navigating, and completing other group activity.<sup>84</sup>

Vessel traffic and noise has increased in recent years due to greater marine commercialization and population rise in the area.<sup>85</sup> Fast ferry and water taxi traffic has increased significantly in recent years and it is estimated that such vessels travel over 300,000 miles (in more than 10,000 hours) annually in Puget Sound.<sup>86</sup> Due to the high speeds of these vessels,

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<sup>78</sup> *Dams on the West Coast*, NOAA FISHERIES, <https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/dams-west-coast> [<https://perma.cc/SS6W-7VDK>] (Sept. 30, 2019).

<sup>79</sup> Jacobs, *supra* note 68.

<sup>80</sup> *Columbia River Basin Fish Accords Extensions*, BONNEVILLE POWER ADMIN., <https://www.bpa.gov/efw/FishWildlife/CBFA/Pages/default.aspx> [<https://perma.cc/MXA5-WCTX>].

<sup>81</sup> Saving the Southern Residents, *supra* note 13.

<sup>82</sup> Recovery Plan, *supra* note 2, at II-113–14.

<sup>83</sup> *Killer Whale*, NOAA Fisheries, <https://www.fisheries.noaa.gov/species/killer-whale> [<https://perma.cc/YCG3-DNZS>].

<sup>84</sup> Recovery Plan, *supra* note 2, at II-113–14.

<sup>85</sup> Report and Recommendations, *supra* note 66, at 27-28.

<sup>86</sup> *Id.*

there is an increased possibility of collisions with orcas, not to mention disruption to the animals' range of travel and migration patterns throughout the Salish Sea region. Ferry usage throughout the Greater Seattle Area and between the San Juan Islands has remained relatively stable in terms of average annual daily traffic from 2007-2016 and is likely to remain that way— if not increase— as the urbanization of Washington continues.<sup>87</sup> Military operations, with an important base on Whidbey Island, could play a key role in future habitat disruption.<sup>88</sup> The U.S. Navy has proposed new underwater training and testing operations off the coast of Cape Flattery in which operations include detonating explosives, increased sonar testing, and the use of other new harmful technologies.<sup>89</sup> The Navy has acknowledged that SRKW territory has already been altered by military testing.<sup>90</sup> The Navy's newest proposed activities are very likely to increase noise and other associated disturbances that adversely affect the Southern Residents, including the potential for death.<sup>91</sup> Since NOAA designated the SRKWs as endangered and defined their critical habitat, it has granted permits and exceptions to government researchers, scientists, and the military for incidental contact and "takings."<sup>92</sup> Over the years, the public has petitioned NOAA to reconsider SRKWs' critical habitat to encompass more of the Pacific Ocean, specifically from the Canadian border to Point Sur, California, in order to create a wider protected area for the SRKWs.<sup>93</sup> Such a petition is currently going through the informal rulemaking process, but various coastal waters are excluded for national security purposes.<sup>94</sup>

### 3. Contaminants

The final major threat that SRKWs face is the danger of toxic contaminants.<sup>95</sup> Contaminants are found in the water, in food sources, and in the fatty tissues of the whales.<sup>96</sup> These contaminants pose the greatest danger when the orcas are malnourished and running off stored fuel in their bodies.<sup>97</sup> Contaminants pose a significant threat because of their constant

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<sup>87</sup> 2016 ANNUAL TRAFFIC REPORT, WASHINGTON STATE DEPARTMENT OF TRANSPORTATION, at 54, [https://www.wsdot.wa.gov/mapsdata/travel/pdf/Annual\\_Traffic\\_Report\\_2016.pdf](https://www.wsdot.wa.gov/mapsdata/travel/pdf/Annual_Traffic_Report_2016.pdf) [<https://perma.cc/2RJ9-BFUL>].

<sup>88</sup> Recovery Plan, *supra* note 2, at II-114.

<sup>89</sup> Mayor Jenny A. Durkan, *2019 Draft Navy Northwest Training and Testing Supplemental Environmental Impact Statement*, <https://durkan.seattle.gov/wp-content/uploads/sites/9/2019/06/06.12.19-Navy-Draft-EIS-Resolution.pdf> [<https://perma.cc/8QF2-FM5R>].

<sup>90</sup> *Id.*

<sup>91</sup> Southern Resident Orca Task Force, *supra* note 47, at 10-11.

<sup>92</sup> 16 U.S.C. § 1539 Exceptions (1988) (The term "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct).

<sup>93</sup> 84 Fed. Reg. 55530 (2019), available at <https://www.govinfo.gov/app/details/FR-2019-10-17/2019-22445> [<https://perma.cc/4GF8-4ECL>].

<sup>94</sup> *Id.*

<sup>95</sup> Saving the Southern Residents, *supra* note 13.

<sup>96</sup> Recovery Plan, *supra* note 2, at II-87-8

<sup>97</sup> *Id.*

presence in SRKWs habitat, the frequent emergence of new contaminants, and the lack of regulatory mechanisms to control the flow of contaminants.<sup>98</sup> Contaminants and pollutants reach the SRKWs through stormwater runoffs, rivers and tributaries, road runoff, and various bad actors.<sup>99</sup> Washington state has sought to lessen the overall runoff of pollution into its ocean waters by retrofitting its stormwater runoff and is currently seeking new methods of wastewater treatment to ensure contaminants are not released into the wild.<sup>100</sup>

One of the most dangerous global environmental contaminants, polychlorinated biphenyls (PCBs), are man-made chemical compounds that can cause disease and other toxic effects when accumulated and are found throughout living organisms.<sup>101</sup> The state of Washington filed the nation's first statewide environmental lawsuit against the agricultural giant Monsanto for allegedly knowing the effects of PCBs, continuing to produce them, and disposing of them in a harmful manner.<sup>102</sup> After three years of litigation, the case was resolved for \$95 million dollars, and included an agreement between Monsanto and Washington state to settle Monsanto's "manufacturing, marketing, and distribution liability related to PCBs" in the state.<sup>103</sup>

Evidence suggests that SRKWs are most likely to come into contact with PCBs and other contaminants through the Puget Sound area water and from their steady consumption of Chinook salmon.<sup>104</sup> While the threat of mortality from PCB-contamination is not known and may not be direct, some evidence links the contaminant in SRKWs to immune system suppression which in turn can increase susceptibility to infectious diseases.<sup>105</sup>

### B. Additional Threats

The government, public, and private entities agree that prey availability, vessel noise, and contamination are the three major threats facing SRKWs and driving the decline of their ailing population.<sup>106</sup> This may be

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<sup>98</sup> *Id.* at II-72-4.

<sup>99</sup> Report and Recommendations, *supra* note 66, at 34-35.

<sup>100</sup> Southern Resident Orca Task Force, *supra* note 47, at 30.

<sup>101</sup> Recovery Plan, *supra* note 2, at II-93.

<sup>102</sup> Press Release, Washington State Office of the Attorney General, *AG Ferguson makes Washington first state to sue Monsanto over PCB damages, cleanup cost* (Dec. 8, 2016), <https://www.atg.wa.gov/news/news-releases/ag-ferguson-makes-washington-first-state-sue-monsanto-over-pcb-damages-cleanup> [<https://perma.cc/VF56-EH6P>].

<sup>103</sup> Press Release, Washington State Office of the Attorney General, *Monsanto To Pay Record \$95 Million to End Ferguson's Lawsuit Over PCBs*, (June 24, 2020), <https://www.atg.wa.gov/news/news-releases/monsanto-pay-record-95-million-end-ferguson-s-lawsuit-over-pcb>s [<https://perma.cc/SGB8-H5LP>].

<sup>104</sup> Recovery Plan, *supra* note 2, at II-96.

<sup>105</sup> *Id.* at II-94.

<sup>106</sup> Saving the Southern Residents, *supra* note 13.

true today, but any number of hazards that remain could ultimately push the species into extinction by killing off the reproductively active members or continuing the pattern of stillborn calves.

### 1. Disease

Disease is a leading cause for concern among killer whales' small, tight-knit population.<sup>107</sup> Disease is also more likely to occur among a species that occasionally inbreeds.<sup>108</sup> SRKWs fit into both these categories.<sup>109</sup> More research needs to be collected to learn whether specific bacteria or viruses are having a substantial effect on the SRKWs, but the high concentration of contaminants, small population size, and collective social structure are all factors that make it an at-risk species of catching and spreading disease quickly.<sup>110</sup>

### 2. Oil Spills

Oil spills can have immediate and devastating effects on the environment. The most notable oil spill, and coincidentally most harmful to SRKWs, was the Exxon Valdez spill of 1989 off the Alaskan waters of Prince William Sound.<sup>111</sup> Eleven million gallons of crude oil leaked out into the water following a tanker crash on a natural reef.<sup>112</sup> Every species in the area was affected and, shortly after the spill, local killer whales were hit by an accumulation of contaminants, toxic food, and intense, searing fumes.<sup>113</sup> Approximately one-third of the resident killer whales disappeared after the spill.<sup>114</sup>

### 3. Climate Change

The uncertainties of accelerating climate change are bound to affect the SRKWs and their habitat. Most climate change occurs unseen, as the oceans absorb vast amounts of carbon dioxide emissions and becomes

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<sup>107</sup> Recovery Plan, *supra* note 2, at II-73.

<sup>108</sup> *Id.* at II-123.

<sup>109</sup> *Id.* at II-120–21.

<sup>110</sup> JOSEPH F. GAYDOS ET AL., A REVIEW OF POTENTIAL INFECTIOUS DISEASE THREATS TO SOUTHERN RESIDENT KILLER WHALES (ORNICUS ORCA) 1 (BIOLOGICAL CONSERVATION 2004), <http://www.eurocbc.org/A%20Review%20of%20Potential%20Infectious%20Disease%20Threats%20to%20Southern%20Resident%20Killer%20Whales.pdf> [https://perma.cc/Q94T-XK2F].

<sup>111</sup> Doug Struck, *Twenty Years Later, Impacts of the Exxon Valdez Linger*, YALE ENVIRONMENT 360 (Mar. 24, 2009), [https://e360.yale.edu/features/twenty\\_years\\_later\\_impacts\\_of\\_the\\_exxon\\_valdez\\_linger](https://e360.yale.edu/features/twenty_years_later_impacts_of_the_exxon_valdez_linger) [https://perma.cc/LJJ6-MN2R].

<sup>112</sup> *Id.*

<sup>113</sup> *Id.*

<sup>114</sup> *Id.*

more acidic.<sup>115</sup> This absorption increases temperatures, affects the abilities of shellfish and corals to create their skeletons and shell, and affects fish reproductive patterns, ultimately causing death if water becomes too acidic.<sup>116</sup> The harms of climate change are thus twofold for the SRKWs. First, salmon (their main source of prey) are affected by climate change in the rivers where they spawn and the oceans once they reach maturity, all factors which could stunt their growth and further constrain SRKWs' access to food.<sup>117</sup> Second, ocean acidification may change the migratory habits of our own Southern Residents.<sup>118</sup> Killer whales, as a species, can be found throughout all the world's oceans.<sup>119</sup> Killer whales are most numerous in the cold waters of Antarctica, Norway, and Alaska, but can also be found in tropical and subtropical waters.<sup>120</sup> Resident Killer Whales have been studied from California to Russia; Transient Killer Whales are found mainly in the eastern North Pacific; and Offshore Killer Whales are often found more than nine miles off various coastlands.<sup>121</sup> Climate change is very likely to affect how these distinct population segments interact and, hopefully, adapt in the future.

The Puget Sound and Salish Sea areas are particularly vulnerable to climate change and ocean acidification due to their composition of colder, freshwater tributaries.<sup>122</sup> Climate change is anticipated to increase water temperatures throughout the region which will affect the lifecycle of Chinook salmon in its early freshwater stages and secondary life in the ocean.<sup>123</sup> Higher temperatures may also bring additional predators into the SRKWs territory to compete for food, thus contributing to an even greater scarcity of prey.<sup>124</sup>

While the threats of today loom large, new threats have the potential to be more devastating as any additional variables must be factored into the SRKWs hampered lives. These threats are likely to be more dangerous because of their quick-moving nature and ability to overrun an entire pod.

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<sup>115</sup> *Climate Change Indicators: Ocean Acidity*, U.S. ENV'T PROT. AGENCY, <https://www.epa.gov/climate-indicators/climate-change-indicators-ocean-acidity> [<https://perma.cc/K525-VF8F>] (last updated Aug. 2016).

<sup>116</sup> *Climate Change Indicators: pH Scale*, U.S. ENV'T PROT. AGENCY, <https://www.epa.gov/sites/production/files/styles/large/public/2016-11/acidity-ph-scale-download-2016.png> [<https://perma.cc/VXF8-GJPL>].

<sup>117</sup> Wasser et al., *supra* note 60, at 28.

<sup>118</sup> Recovery Plan, *supra* note 2, at II-84.

<sup>119</sup> *Id.* at II-1-2.

<sup>120</sup> Columbia River Basin Fish Accords Extensions, *supra* note 80.

<sup>121</sup> *Id.*

<sup>122</sup> Southern Resident Orca Task Force, *supra* note 47, at 44.

<sup>123</sup> ESA Recovery Plan, *supra* note 56, at 39.

<sup>124</sup> *Id.* at 39.



## IV. PROPOSED SOLUTIONS

## A. Breaching the Lower Snake River Dams

For years, the idea of breaching the dams along the Columbia River Basin was never taken seriously by legislators with the authority to do so.<sup>125</sup> Now, there is a groundswell of support to look into the matter due to environmental concerns. Governor Jay Inslee's Orca Task Force has proposed establishing a collaborative and stakeholder-involved process to review, discuss, and study the potential breaching and removal of these dams.<sup>126</sup>

Proponents of the dams, including Washington state representatives, claim that they result in an average of nearly 97% of juvenile salmon maneuvering a safe path down to free flowing waters before returning to their rivers of origin to spawn.<sup>127</sup> However, this does not account for the aggregation of repeated dam traversal by juvenile salmon which has increased their migration time by over a month in many cases.<sup>128</sup> This additional time means the young smolts are exposed to predators and other threats before they reach the safety of open water. Fewer naturally occurring salmon will continue to devastate the SRKW's diet and cannot be supplemented with only hatchery fish. Hatchery fish are smaller and are not imbued with the instincts possessed by wild-born fish, making them easier prey for killer whales.<sup>129</sup> This means that by hunting hatchery raised salmon, rather than wild-born salmon, SRKWs are expending less energy hunting and consuming less energy, both harmful effects for a creature that requires a massive caloric intake and expenditure per day.<sup>130</sup> While hatchery fish are part of the solution for Chinook recovery and ensuring an abundance of prey for SRKWs, the Chinook salmon's obstructed, damaged ecosystem is preventing a strong recovery.

Studies consistently show that the SRKW and Chinook salmon populations are not recovering.<sup>131</sup> Government-funded programs have poured over one billion dollars into each species' recovery, respectively,

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<sup>125</sup> Lynda V. Mapes, *Controversy Heats Up Over Removal of Lower Snake River Dams as Orcas Suffer Losses*, THE SEATTLE TIMES (Sept. 22, 2018), <https://www.seattletimes.com/seattle-news/environment/controversy-heats-up-over-removal-of-lower-snake-river-dams-as-orcas-suffer-loses/> [<https://perma.cc/WA4X-S4LM>].

<sup>126</sup> Southern Resident Orca Task Force, *Final Report and Recommendations*, CASCADIA CONSULTING GROUP at 72 (Nov. 2019), [https://www.governor.wa.gov/sites/default/files/OrcaTaskForce\\_FinalReportandRecommendations\\_11.07.19.pdf](https://www.governor.wa.gov/sites/default/files/OrcaTaskForce_FinalReportandRecommendations_11.07.19.pdf) [<https://perma.cc/RDC3-FG8S>].

<sup>127</sup> Press Release, Congresswoman Cathy McMorris Rodgers, McMorris Rodgers, Newhouse, and Herrera Beutler Respond to Seattle Democrats' Opposition to Columbia and Snake River Dams, (Feb. 22, 2018) <https://mcmorris.house.gov/mcmorris-rodgers-newhouse-herrera-beutler-respond-seattle-democrats-opposition-columbia-snake-river-dams/> [<https://perma.cc/7DS5-VCF8>].

<sup>128</sup> Jacobs, *supra* note 68.

<sup>129</sup> Report and Recommendations, *supra* note 66, at 19.

<sup>130</sup> Recovery Plan, *supra* note 2, at II-81.

<sup>131</sup> Saving the Southern Residents, *supra* note 13; ESA Recovery Plan, *supra* note 56, at 157.

to little avail.<sup>132</sup> With the uncertainty of future variables such as climate change and disease, concrete steps must be taken via legislative action to conserve these species' habitat and protect future generations.

The Obama Administration considered breaching the dams along the Columbia and Snake River System as a "contingency of last resort."<sup>133</sup> In 2009, a federal district court judge in Oregon ordered a review of the Federal Columbia River System Biological Opinion (FCRS BiOp) to ensure the report satisfied the requirements under measures such as the ESA and MMPA.<sup>134</sup> The Obama Administration and Army Corps of Engineers undertook a review of the science, determined their findings were sound, and concluded that the dams need not be breached for the salmon recovery efforts.<sup>135</sup> Yet, in a subsequent BiOp, a court found differently.<sup>136</sup> In *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, the plaintiffs challenged the government as acting arbitrarily and capriciously in issuing its 2014 BiOp.<sup>137</sup> The plaintiffs alleged that they did not violate the ESA, and that the BOR and Army Corps of Engineers violated the National Environmental Protection Act by not acting in accordance with their "reasonable and prudent" alternatives.<sup>138</sup> The District Court Judge held in favor of the plaintiffs on both issues, and stated:

[T]he federal action agencies (here, the Corps and BOR) [must] prepare a comprehensive environmental impact statement that evaluates a broad range of alternatives that may finally break the decades-long cycle of court-invalidated biological opinions that identify essentially the same narrow approach to the critical task of saving these dangerously imperiled species.<sup>139</sup>

In doing so, the judge signaled a move away from deference to the agency's stated reasons for carrying out actions and opened a door for environmental groups to challenge the feasibility of the dams and for the legislature to confront the environmental issues the dam system imposes on SRKWs and salmon species.

The court also rejected the 2008 BiOp's new analytical approach.<sup>140</sup> The 2008 BiOp considered whether the species was on a "trend toward recovery" and if agency action affected the critical habitat or

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<sup>132</sup> CRS BiOp, *supra* note 35.

<sup>133</sup> *Lower Snake River Fish Passage Improvement Study: Dam Breaching Update*, US ARMY CORPS OF ENGINEERS at 5, (Mar. 2010), [https://www.nww.usace.army.mil/Portals/28/20100330\\_AMIP\\_NWW.pdf](https://www.nww.usace.army.mil/Portals/28/20100330_AMIP_NWW.pdf) [<https://perma.cc/9SQD-8XC4>] [hereinafter "Snake River Improvement Study"].

<sup>134</sup> *Id.* at 4.

<sup>135</sup> *Id.*

<sup>136</sup> *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 184 F. Supp. 3d 861 (D. Or. 2016).

<sup>137</sup> *Id.*

<sup>138</sup> *Id.* at 868-869.

<sup>139</sup> *Id.* at 871.

<sup>140</sup> *Id.* at 888.

whether the critical habitat retained the ability to be functional.<sup>141</sup> The court held that this new analytical framework deviated from the structure of the National Environmental Protection Act and Endangered Species Act by imposing a newly defined set of standards not imposed by either Act.<sup>142</sup> The 2014 BiOp metrics considered were not related to any population goal, but rather focused directly on the agency-defined “trend toward recovery” standard with variables that were heavily weighted in favor of finding positive correlation.<sup>143</sup> The “trending toward recovery” standard fails to consider the concerns expressed by courts and NOAA Fisheries relating to the dangers of sustained low abundance levels, therefore rendering it arbitrary and capricious.<sup>144</sup> The Court ordered that the government undertake a review and revision of its Columbia River Basin 2014 BiOp, as well as all future BiOps, to act in accordance with the requirements set forth in the National Environmental Protection Act.<sup>145</sup> It also addressed the challenges facing SRKWs but deferred to the government’s evidence showing that any link between Chinook salmon and SRKWs was offset by the use of hatchery fish.<sup>146</sup> Currently, there is no study on the SRKWs’ diet to rebut the government’s evidence showing that their reliance on hatcheries as a sole solution is not justified. However, this judgment lays forth a path to address the loss of salmon habitat and dam breach along the Columbia River Basin.

The Washington State Orca Task Force has implemented a stakeholder process to review the dams on the Lower Snake River in order to determine whether removal or breach is required. This is a definite step in the right direction, considering the idea was brushed off as unattainable or unrealistic for so long by those with power and influence to do so. At the same time, inviting the actors who run the dams and thus maintain in interest in their perpetual operation is akin to inviting the fox into the henhouse, as they have acted arbitrarily and capriciously when issuing decisions and previously disregarded environmental claims of dam removal as extreme.<sup>147</sup> To compound the difficulty of these assessments, the conversions involve gauging individual efforts, species recovery, and overall environmental impacts in terms of dollars spent or saved. Cost-benefit analyses of this nature are imbued with uncertainty, with outcomes largely determined by how much weight is given to certain variables or circumstantial factors. The Army Corps use the National Economic Development (NED) method when evaluating the feasibility of projects, which displays

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<sup>141</sup> *Id.* at 881.

<sup>142</sup> *Id.* at 888.

<sup>143</sup> *Id.*

<sup>144</sup> *Id.* at 892.

<sup>145</sup> *Id.* at 948.

<sup>146</sup> *Id.* at 949.

<sup>147</sup> Report and Recommendations, *supra* note 66, at 60.

results by measuring “[c]hanges in the economic value of the national output of goods and services, and measures economic efficiency at a national level. It does not measure economic gains or losses of a region ... Adverse effects measured are the opportunity costs of resources used in implementing the plan.”<sup>148</sup> This quantitative analysis will invariably lead to a result that ensures the dam system stays in place as part of the federal infrastructure, utility, and commerce arrangement. Studies of this nature are often plagued with conflicts of interest, in this case between those who run the dam and those who believe that breaching the dam is the best chance at restoring the ecosystem. To prevent this issue, additional studies must be conducted to assess the benefits to the regional areas or environments from breaching the dams or any other legal regulations.

NOAA has acknowledged that protection, conservation, and restoration of an ecosystem is the most likely path to provide a species’ recovery.<sup>149</sup> The Endangered Species Act further requires that no agency actions jeopardize the continued existence of any threatened or endangered species or result in modifications to or the destruction of its habitat.<sup>150</sup> In NOAA Fisheries’ 2019 BiOp, it was determined that agency projects involving the breach of levees or dikes in estuaries restored the greater riparian area and improved the overall functioning of the juvenile salmon migration corridor.<sup>151</sup>

There have been multiple examples of successful dam breaches in the Pacific Northwest. The 2011 breaches of the Elwha Dam and the Glines Canyon Dam have led to the return of the Elwha River on the Olympic Peninsula into the Strait of Juan de Fuca.<sup>152</sup> With the dam breaches, the entire ecosystem is slowly regenerating. Salmon have returned unaided to areas above the previous dam-line for the first time in over a century, though not without complications due to a large supply of new sediment from the newly established river flow.<sup>153</sup> Additionally, hatchery released salmon have found a way to flow into an ecosystem that was previously foreign to them, thus contributing to the overall flow of salmon to the region.<sup>154</sup> Another breach that promoted salmon recovery and helped restore the ecological system was the Condit Dam removal along the White

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<sup>148</sup> Snake River Improvement Study, *supra* note 133.

<sup>149</sup> Recovery Plan, *supra* note 2, at IV-6-7.

<sup>150</sup> 16 U.S.C. § 1536(a)(2) (1973).

<sup>151</sup> Endangered Species Act Section 7(a)(2) Biological Opinion, *supra* note 35, at 246.

<sup>152</sup> Kate Schimel, *After Its Dams Came Down, A River Is Reborn*, HIGH COUNTRY NEWS (Sept. 4, 2017), <https://www.hcn.org/issues/49.15/rivers-six-years-after-its-dams-came-down-a-river-is-reborn> [<https://perma.cc/M9ZT-DZT3>].

<sup>153</sup> *Id.*

<sup>154</sup> *Id.*

Salmon River.<sup>155</sup> Yet in both cases, there were complaints from nearby landowners and interested stakeholders.<sup>156</sup> Some of the adverse effects that landowners and stakeholders complained of included economic harm to property owners, increased fire volatility, and harm from sedimentary damage.<sup>157</sup> Researchers concerns surrounding salmon spawning affected by the sediment overflow of dam breaches have turned out to be overblown; as old spawning grounds are covered, the new, returning salmon have nested on top of the sedimentary floor, creating a future home for their offspring.<sup>158</sup> Ecological systems adapt when there are not manmade obstructions, as demonstrated through these salmon population increases and habitat recovery.<sup>159</sup>

NOAA Fisheries filed its own BiOp in response to the Glines Canyon and Elwha Dam removals. The agency forecasted that possible short-term adverse effects from three-to-five years were likely to occur as a result of sediment degradation and dispersal throughout the river, but that the long-term effects on salmon and other species would be positive as the migratory corridor reopened to native species.<sup>160</sup> However, with the return of a free-flowing river, most sediment was pushed out of the immediate area quickly and native species flocked back.<sup>161</sup> With the return of these species, nutrients which had previously been missing from the river's ecological system were deposited upstream, helping the river and its inhabitants adapt and recover more quickly to the new environment.<sup>162</sup>

Congressional action should be taken at both the state and federal level to address dam removal. Coordinated efforts should be used to revisit the cost-benefit analysis of the current and future operational dam structures in conjunction with new and emerging technologies for renewable energy. The benefit to congressional review of these systems as opposed to the court-mandated review of the Bonneville Power Administration's BiOp is that the auditors would not have a directly invested stake in the outcome. A report prepared for Vulcan, Inc. in 2018 including a cost-benefit analysis of removal of the four Lower Snake River Dams provided a

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<sup>155</sup> Dameon Pesanti, *Condit Dam: Life After the Breach*, COLUMBIAN (2016), <https://www.columbian.com/news/2016/oct/23/condit-dam-life-five-years-after-breach-white-salmon-river/> [<https://perma.cc/AH2L-J2GN>].

<sup>156</sup> *Id.*

<sup>157</sup> *Id.*

<sup>158</sup> *Id.*

<sup>159</sup> *Id.*

<sup>160</sup> Schimel, *supra* note 152.

<sup>161</sup> Tara Lohan, *The Elwha's Living Laboratory: Lessons from the World's Largest Dam-Removal Project*, REVELATOR (Oct. 1, 2018), <https://therevelator.org/elwha-dam-removal/> [<https://perma.cc/VSV5-65DW>].

<sup>162</sup> *Id.*

staggering result.<sup>163</sup> The bottom line of the study determined that the dams should be removed, as their costs exceeded potential benefits by over \$8.5 billion when extrapolating the projections out to 2045.<sup>164</sup> Congress should support bipartisan, fiscally responsible, environmentally friendly legislation in order to solve the environmental problems caused by dams and create jobs in the region for federal workers that would otherwise be harmed from the dam removal.

A legal challenge to the efficiency and cost-benefits of the dams in a friendly court, like the Oregon District Court, could press the controversial issue of breaching the dams further along. Challenges to the Lower Snake River's current operating dam system must continue to push the federal agencies running the dams in order to ensure full mandatory environmental compliance. Federal District Courts have addressed the proposed solutions to revitalizing the endangered SRKWs and Chinook salmon, noting they have failed to meet stated goals for over 20 years.<sup>165</sup>

As things get worse for the SRKWs, their fight with the law may get better. District Courts may find that failed proposals allow the judicial system to order injunctive relief on behalf of environmental concerns. Substantial evidence that shows a convincing link between the Chinook salmon runs and free-flowing rivers will support activists' argument that dams should be breached to rejuvenate the ecosystem. Additional reports evaluating the future cost-benefits of dams, with the concurrent emergence of new technologies, may conclude dams are more costly to maintain and harmful to the environment than non-breach.<sup>166</sup> Though time is running thin for the SRKWs, a court may find the argument of time to be the strongest in favor of breaching the dams.

### B. *Short-term Increase of Salmon Hatchery Production*

While breaching the dams is likely to be the most effective recovery method for the long-term viability of Chinook salmon, incremental progress must also be achieved. Hatchery fish cannot replace natural, wild-born salmon, but they can help supplement the population.<sup>167</sup> As of 2008,

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<sup>163</sup> *Lower Snake River Dams: Economic Tradeoffs of Removal*, ECONORTHWEST (July 29, 2010), [https://srkwcsi.files.wordpress.com/2019/07/lrsd\\_economic\\_tradeoffs\\_report.pdf](https://srkwcsi.files.wordpress.com/2019/07/lrsd_economic_tradeoffs_report.pdf) [<https://perma.cc/WLM5-PQ9F>].

<sup>164</sup> *Id.* at iv-vii.

<sup>165</sup> Snake River Improvement Study, *supra* note 133, at 16.

<sup>166</sup> Lohan, *supra* note 161.

<sup>167</sup> Independent Science Panel, David Marmorek & Alexander Hall, *The Effects of Salmon Fisheries On Southern Resident Killer Whales: Final Report Of The Independent Science Panel*, NOAA FISHERIES at xiii (2012), [https://archive.fisheries.noaa.gov/wcr/publications/protected\\_species/marine\\_mammals/killer\\_whales/recovery/kw-effects\\_of\\_salmon\\_fisheries\\_on\\_srkw-final-rpt.pdf](https://archive.fisheries.noaa.gov/wcr/publications/protected_species/marine_mammals/killer_whales/recovery/kw-effects_of_salmon_fisheries_on_srkw-final-rpt.pdf) [<https://perma.cc/HH59-T58F>].

hatchery raised salmon accounted for 75% of all available Washington state Chinook salmon.<sup>168</sup>

The Washington State Department of Fish and Wildlife should focus its hatchery growth in two specific areas: (1) it must place additional hatcheries in areas around dams to increase the rate of SARs; and (2) designated hatcheries should work to develop older and larger salmon. These two focuses will allow for greater hatchery production rates and will increase the size of hatchery raised salmon. However, any additional funding for the state hatchery program would need to be appropriated by the legislature to implement any improvements or modifications to the state's current program. This money would be used to open new hatcheries and to help sustain ongoing operations, with the eventual goal of increasing production and releasing larger, matured salmon into the wild. Due to the importance of hatchery salmon, and the unlikelihood of improving natural, wild born populations to historical rates within the next few years, the state must continue to supplement Chinook salmon for the overall ecological system, but with the intention of raising larger, healthier salmon.

### C. *Executive Order*

As a leader in environmental activism, Washington state has a key role to play when it comes to protecting and conserving habitat. Governor Jay Inslee should be willing to issue an executive order based on his Orca Task Force's findings and the broader public opinion. Though the Governor does not have authority to approve removal of federally operated dams, his backing on such a key issue would likely move the direction of the argument. The Office of the Governor has more inherent powers to enact change, as the J, K, and L pods continue to swim throughout the Salish Sea, than the commission of a research task force to prepare studies and reports similar to those of the federal government. Therefore, the Governor should issue material relief to these creatures by executive order directing funds and various protections for the SRKWs, such as expanding their critical habitat in the San Juan Islands and mandating reduced marine traffic in areas where orca pods are spotted.

## V. CONCLUSION

The SRKWs are struggling to keep afloat. Their population has dwindled since the early 2000s and has seen an unfortunate trend of still-born calves throughout their pods.<sup>169</sup> Studies and reports point to three consistent factors endangering the species, with the most prominent issue

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<sup>168</sup> Recovery Plan, *supra* note 2, at II-77.

<sup>169</sup> Saving the Southern Residents, *supra* note 13.

being the availability of Chinook salmon.<sup>170</sup> While incremental steps are being taken to address the concerns facing these species, neither the salmon nor SRKWs are returning to numbers reaching self-sustainability, where they could be removed from the ESA protections.<sup>171</sup> Granted, society is far from the days where SRKWs were referred to as “blackfish” and shot at indiscriminately by fisherman and hunters.<sup>172</sup> The current proposed path forward seems to only grant SRKWs a slim chance of survival. Notwithstanding, there are opportunities to assist the species, but without action, we may lose an invaluable cultural and environmental asset before we know it.

As the leading factor of the Southern Residents’ decline, humans must act swiftly and decisively to provide the SRKWs a second chance for a viable, essential future in the Pacific Northwest. Therefore, effective action must be taken – breaching the dams along the Lower Snake River will restore the Chinook salmon and provide the SRKWs an abundance of prey. Dam removal will create a multitude of positive downstream effects as the region reshapes itself into a more sustainable ecological system. These outcomes will provide the greatest opportunity to conserve and protect the SRKWs’ habitat and reinvigorate its essential prey populations, helping to ensure that SRKWs continue to have a home in the future.

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<sup>170</sup> *Id.*

<sup>171</sup> See generally Recovery Plan, *supra* note 2.

<sup>172</sup> Mapes, *supra* note 8.