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IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF OREGON
PORTLAND DIVISION

NORTHWEST ENVIRONMENTAL DEFENSE CENTER, **WILDEARTH GUARDIANS**, and **NATIVE FISH SOCIETY**,

Plaintiffs,

v.

U.S. ARMY CORPS OF ENGINEERS and **NATIONAL MARINE FISHERIES SERVICE**,

Defendants,

and

CITY OF SALEM and **MARION COUNTY**,

Defendant-Intervenors,

Case No. 3:18-cv-00437-JR

MOTION FOR PRELIMINARY INJUNCTION AND MEMORANDUM IN SUPPORT

Oral Argument Requested

MOTION FOR PRELIMINARY INJUNCTION

Pursuant to Federal Rule of Civil Procedure 65, Plaintiffs Northwest Environmental Defense Center, WildEarth Guardians, and Native Fish Society hereby move to obtain an order from this Court requiring the U.S. Army Corps of Engineers ("the Corps") to take immediate actions to reduce mortality of and injury to Upper Willamette River ("UWR") Chinook salmon and Upper Willamette River steelhead from its ongoing operation of the Willamette River Basin Flood Control Project ("Willamette Project"). The Corps is violating the Endangered Species Act ("ESA") by continuing to operate the Willamette Project in ways that cause significant and irreversible harm to these species and their habitat before completing a new ESA consultation over operation of the Project.

In light of the continued decline of these highly imperiled species, the ongoing adverse effects of the Willamette Project, and the length of time the Corps estimates is needed to complete a new consultation, Plaintiffs request an injunction that would alter operations of the Willamette Project to improve conditions for salmon and steelhead pending completion of consultation. As described more fully in the accompanying memorandum, Plaintiffs' requests focus on operational changes to improve water quality, water flows, and fish passage past dams to meet the needs of UWR Chinook salmon and steelhead.

In light of the important public interest nature of this litigation and the nonprofit status of the litigants, Plaintiffs request that this Court waive any injunction bond under Federal Rule of Civil Procedure 65(c).

MEMORANDUM IN SUPPORT OF MOTION FOR PRELIMINARY INJUNCTION

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INTRODUCTION

The plight of salmon in the Pacific Northwest is dire, with many species on the brink of extinction. Because salmon must swim tens or even hundreds of miles from their natal streams to the ocean and then back again to reproduce, dams are one of the biggest impediments to these species' survival. Numerous agencies, Tribes, and other parties have worked for years to improve fish migration past dams in the Columbia River. Significant changes to operation of those dams has occurred over the years, but often only through court intervention. Although many of the dams in the Upper Willamette River basin were built prior to the Columbia River dams, and cause similar problems for salmon and steelhead, no significant changes have occurred to operation of the Willamette dams to benefit fish. In fact, the situation is similar to that described about management of the Columbia River dams by this Court in 1994:

> [T]he process is seriously, "significantly," flawed because it is too heavily geared toward a status quo that has allowed all forms of river activity to proceed in a deficit situation—that is, relatively small steps, minor improvements and adjustments—when the situation literally cries out for a major overhaul. Instead of looking for what *can* be done to protect the species from jeopardy, . . . the action agencies have narrowly focused their attention on what the establishment is capable of handling with minimal disruption.

Idaho Dep't of Fish & Game v. Nat'l Marine Fisheries Serv., 850 F. Supp. 886, 900 (D. Or. 1994). Nearly twenty-five years later, that description equally applies to the Willamette Project.

The plight of UWR Chinook salmon and steelhead depends in large part on significant changes to operation and maintenance of the Willamette Project that will allow for access to historic upstream spawning habitat and improve downstream habitat conditions. The National Marine Fisheries Service ("NMFS") told the Corps ten years ago about numerous changes that needed to occur to the Project to avoid jeopardizing the survival and recovery of the two fish species. The Corps, however, has failed to implement crucial changes within the required

timeframe, particularly measures to improve downstream migration of juvenile fish past the dams—actions that are feasible to implement quickly.

Shortly after Plaintiffs filed this lawsuit, the Corps agreed to conduct a new ESA consultation with NMFS to establish a new management regime for the Willamette Project, again with the aim to recover UWR Chinook salmon and steelhead. Pending completion of this consultation—which the Corps estimates will take until 2023—operation and maintenance of Willamette Project dams will continue to cause significant harm to UWR salmon and steelhead. Further declines of these species in recent years calls for immediate actions to reduce this harm. Plaintiffs therefore seek an injunction to require the Corps to make immediate operational changes that will improve water quality, water flows, and fish migration through reservoirs and past dams pending completion of the new ESA consultation.

STATEMENT OF FACTS

I. Upper Willamette River Chinook Salmon and Steelhead.

The only species of anadromous salmonids to historically inhabit the Upper Willamette River basin—which includes habitat above Willamette Falls in Oregon City—are UWR Chinook salmon and steelhead. These species adapted migration timing to match high spring flows in the Willamette—the only period fish could get upstream past the falls. Pl. Ex. 1 at 2-3, 2-8. UWR Chinook are one of the most genetically distinct groups of Chinook salmon in the Columbia River Basin due to this geographic isolation and unique early run timing compared to other Chinook populations. *Id.* at 2-3; Pl. Ex. 2 at 3-10. With changes to river flows caused by the Willamette Project dams, these fish now ascend the falls via a fish ladder. Pl. Ex. 1 at 2-4.

UWR salmon and steelhead have similar life histories: they are born in freshwater streams, migrate downriver to the ocean and live there for several years, and then return to their

natal streams to reproduce. In general, adult UWR Chinook leave the ocean and enter the Willamette River in late winter, ascend the falls in spring, hold in tributaries for several months and spawn in fall. *Id.* After emerging from eggs in late winter or spring, some juveniles emigrate downriver shortly after they are born while others wait for several months or up to a year before emigrating. *Id.* at 2-5 to 2-6. These varying life histories create important diversity within the species. Declaration of Kirk Schroeder ¶¶ 31, 40. UWR steelhead, which are considered winter steelhead, return to the Willamette River and ascend the falls slightly earlier than UWR Chinook, and spawn in tributaries much earlier—from March through June. Pl. Ex. 1 at 2-8; Schroeder Decl. ¶ 11. Juveniles rear in the tributaries for one to four years before migrating downriver to the ocean, usually in spring or early summer. Pl. Ex. 1 at 2-8. There are seven genetically distinct populations of UWR Chinook salmon, and four distinct populations of UWR steelhead. *Id.* at 2-10, 2-11; Schroeder Decl. ¶¶ 12-13.

Due to significant declines of these species, each is listed as a threatened species under the ESA. Pl. Ex. 2 at 3-8. In addition, ESA critical habitat has been designated for UWR Chinook salmon and steelhead, including the mainstem Willamette River as well as tributaries within each of the population areas. *Id.* at 3-47 to 3-64. The 2011 Recovery Plan for the two species identified the risk of extinction for each population based on viability parameters of abundance, productivity, spatial distribution, and diversity. Pl. Ex. 1 at 3-1. Five of the seven Chinook populations were rated as very high risk of extinction, one was moderate risk, and one was low risk. *Id.* at 6-3. For UWR steelhead, three populations were rated as low risk of extinction and one was rated as moderate risk. *Id.* In order to achieve recovery, all Chinook populations and three steelhead populations needed to improve their risk rating. *Id.* at 6-2, 6-3.

Five years after issuance of the Recovery Plan, NMFS's 2016 status review of UWR

Chinook salmon and steelhead concluded that there was likely a further decrease in the viability status of UWR Chinook salmon; and the decline of the McKenzie population in particular was concerning as that population was previously seen as a stronghold. Pl. Ex. 3 at 15, 42; Schroeder Decl. ¶¶ 33, 35. For UWR steelhead, the status review noted a decline in abundance since 2010, and although the magnitude of those declines was relatively modest, continued declines "would be a cause for concern." Pl. Ex. 3 at 42. The status review recommended that both species retain their threatened status under the ESA. *Id.* at 45. Data from the last two years shows that UWR steelhead have continued to decline. Schroeder Decl. ¶¶ 36, 38.

When added to the detrimental effects of the Willamette Project, cumulative effects such as climate change, sea lion predation, and poor ocean conditions have increased the risk of extinction for UWR salmon and steelhead. Schroeder Decl. ¶ 44. Higher water temperatures and changes to water flows due to climate change are increasingly having an adverse effect on salmon and steelhead, which, when added to the effects of the dams, put the species at greater risk. *Id.* ¶¶ 39, 41, 44; Declaration of Richard Domingue ¶¶ 10; Pl. Ex. 3 at 42.

II. 2008 ESA Consultation Over the Willamette Project.

The Willamette Project consists of thirteen dams on tributaries of the Willamette River, 42 miles of revetments armoring the banks of the Willamette River and its tributaries, and fish hatcheries and other facilities meant to mitigate for the impacts of the dams. Pl. Ex. 2 at 2-9, 2-10 (map), 2-13. Various Flood Control Acts authorized different components of the Project for flood control, navigation, and "other purposes." Pub. L. No. 74-738, § 5, 49 Stat. 1570, 1572, 1591 (1936); Pub. L. No. 75-761, § 4, 52 Stat. 1215, 1216, 1222 (1938); Pub. L. No. 81-516, § 204, 64 Stat. 163, 177-79 (1950); Pub. L. No. 86-645, § 203, 74 Stat. 480, 488, 499 (1960).

The Willamette Project dams have numerous adverse effects on anadromous fish. *See*

generally Schroeder Decl. ¶¶ 15-45; Domingue Decl. ¶¶ 9-55; Declaration of John Johnson ¶¶ 14-47 (discussing impacts to UWR salmon and steelhead from Willamette Project). The greatest impact is that they block access to historic spawning habitat upstream of the dams. Pl. Ex. 2 at 4.1-7. They also alter river flows by storing water in large reservoirs for flood control and then releasing it gradually later in the year, changing the natural level of the river below the dams and eliminating peak flows needed for channel complexity and good fish habitat. *Id.* at 4.1-8. Storing and releasing water from reservoirs changes downstream water temperatures too, generally causing colder than normal temperatures in spring and early summer and warmer than normal temperatures in late summer and fall, impairing salmon and steelhead migration, spawning, and egg incubation. *Id.* at 4.1-8, 4.1-9. Releases of water over or through the dams also can cause excess levels of dissolved gas in downstream water, which can adversely affect fish. *Id.* at 4.1-11. Dams prevent important fish habitat features such as large woody debris and sediment from being transported downstream. *Id.* at 4.1-3. Finally, hatchery fish meant to mitigate for the dams' effects degrade the genetic integrity of wild salmon and steelhead. *Id.*

The dams at issue in this case occur in four subbasins of the Upper Willamette watershed: the Middle Fork Willamette, McKenzie, North Santiam, and South Santiam subbasins. Within the Middle Fork Willamette subbasin, four dams exist—Dexter, Lookout Point, and Hills Creek dams occur on the Middle Fork itself and Fall Creek dam occurs on Fall Creek, a tributary to the Middle Fork. *Id.* at 4.2-6. No UWR steelhead exist in the Middle Fork Willamette subbasin, but historically the Chinook population there may have been the largest population of these fish above Willamette Falls. *Id.* at 4.2-7. Construction of the Willamette Project dams cut off almost all Chinook spawning habitat in this subbasin, and combined with poor spawning habitat downstream of the dams, means very little natural production of Chinook occurs now; the

population is almost all hatchery fish. *Id.* at 4.2-5, 4.2-13. The lack of natural abundance and productivity creates a very high extinction risk for this population, which NMFS considers to be a "core population" that is "critical to the long-term persistence" of the species. *Id.* at 3-9, 4.2-9.

The McKenzie subbasin is also home to only UWR Chinook, not steelhead, and it contains two Project dams: Cougar dam on the South Fork McKenzie River and Blue River dam on Blue River. *Id.* at 4.3-5. Cougar dam blocks access to spawning habitat in the South Fork McKenzie, historically the most heavily used McKenzie River tributary for Chinook spawning. *Id.* at 4.3-13. This Chinook population is a "core" and "genetic legacy" population. *Id.* at 3-9.

The North and South Santiam subbasins each contain two Project dams: Detroit and Big Cliff in the North Santiam and Green Peter and Foster in the South Santiam. *Id.* at 4.5-6, 4.6-6. These two subbasins contain both URW Chinook salmon and steelhead, yet the dams block access to significant amounts of spawning habitat for each species. *Id.* at 4.5-7, 4.5-9, 4.6-11, 4.6-13. The Chinook North Santiam population is a "core" population and the North and South Santiam steelhead populations are "core" and "genetic legacy" populations. *Id.* at 3-9, 3-20.

In addition to storing water for flood control, many of the Project dams produce power by running water through turbines. *Id.* at 2-20. The taller storage dams—Lookout Point, Detroit, and Green Peter—produce power during peak demand times and thus have large daily fluctuations in downstream water flows. *Id.* These fluctuations are moderated by the shorter downstream "re-regulating" dams—Dexter, Big Cliff, and Foster—which produce a constant but small amount of power. *Id.* Hills Creek and Cougar dams are tall and produce power but do not have downstream reregulating dams. *Id.* The Corps regulates water flow by controlling how much water goes through the turbines, through regulating outlets in the dams, or spills over the

top of the dams based on water management plans and hydrologic conditions. *Id.* at 2-12.[1]

In 1999, when UWR Chinook salmon and steelhead were listed as threatened under the ESA, federal agencies began the ESA consultation process to assess the effects of the Willamette Project on UWR Chinook salmon and steelhead. *Id.* at 1-4. The action agencies for the consultation consisted of the Corps as well as Bonneville Power Administration, which markets the power produced at the Project dams, and the U.S. Bureau of Reclamation, which sells some of the storage water for irrigation. *Id.* at 1-3. Numerous delays in the process occurred and, after a lawsuit was filed, NMFS finally issued a biological opinion in 2008. *Id.* at 1-8.

In the 2008 biological opinion ("2008 BiOp"), NMFS described in detail how the continued operation and maintenance of the Project dams in each subbasin would continue to adversely affect UWR Chinook salmon and steelhead. *Id.* at Ch. 5. For instance, for the Middle Fork Willamette subbasin, the BiOp explained that limited upstream and downstream passage at the dams would continue to severely impair access to and from almost all high-quality spawning habitat in the basin, and habitat downstream of the dams would continue to be degraded by lack of sediment and large wood transport, altered flow regimes, and altered water quality below the dams. *Id.* at 5.2-5 to 5.2-21. These detrimental effects would continue to restrict the natural production of UWR Chinook salmon, preventing improvement in abundance, productivity, spatial distribution, and diversity of this population and keeping it at very high risk of extinction. *Id.* at 5.2-29 to 5.2-31. The BiOp stated that significant improvements to the status of the Middle Fork Willamette Chinook population were necessary to improve the viability of the species as a whole, and it was critically important to re-establish natural production in historical habitats

[1] The accompanying declaration of John Johnson explains the dam facilities and how water and fish get through the dams. Johnson Decl. ¶¶ 22-36.

above the dams to improve the status of this population. *Id.* at 5.2-31.

The BiOp contained similar discussions for the other subbasins, identifying the key limiting factors for each population. For the McKenzie Chinook population, lack of access to and from spawning habitat above Cougar dam, degraded habitat conditions downstream of the dam, and hatchery fish introgression were the primary factors impairing the population. *Id.* at 5.3-5, 5.3-26. Similar problems were identified for the South Santiam and North Santiam Chinook and steelhead populations, noting in particular problems with inadequate water flows, altered water temperatures and high dissolved gas levels below Foster dam in the South Santiam subbasin and altered water temperatures and high dissolved gas levels below Big Cliff dam in the North Santiam subbasin, in addition to the lack of access to and from spawning habitat above the dams. *Id.* at 5.5-5 to 5.6-31. In summarizing the effects of Project operations on the two species, the BiOp again focused on the need for improvement to juvenile downstream passage at reservoirs and dams in all four subbasins, water temperature control measures at dams in the Middle Fork Willamette, South Santiam, and North Santiam subbasins, and measures to reduce dissolved gas levels in the North Santiam subbasin. *Id.* at 7-6 to 7-14.

Based on this effects analysis, NMFS concluded in the BiOp that the Corps' continued operation and maintenance of the Willamette Project was likely to jeopardize the continued existence of UWR Chinook salmon and steelhead and destroy or adversely modify their designated critical habitat. *Id.* at 8-4, 8-5. For UWR Chinook, it stated that numbers of natural-origin spawners are low and productivity trends are negative; and that within the freshwater portion of the species' habitat, the species' viability has been limited by factors associated with the Willamette Project. *Id.* at 8-3, 8-4. Many of the significant adverse effects of the Project that contributed to the species' current high risk of extinction would continue due to lack of needed

measures such as effective passage or adequate temperature control. *Id.* at 8-4. For UWR steelhead, NMFS stated that two of the four populations occupy watersheds where habitat has been significantly degraded by Willamette Project operations, and continued operations would prevent access to important spawning and rearing areas and impair water quality and quantity. *Id.* at 8-4, 8-5. Thus, the Project would not allow for recovery of the species. *Id.* at 8-5.

The 2008 BiOp then set forth a Reasonable and Prudent Alternative ("RPA") action that would allow continued operation of the Willamette Project in a way that would avoid jeopardy to the species and adverse modification of their critical habitat. *Id.* at Ch. 9. The RPA added mitigation measures for fish passage past dams, water quality (primarily water temperature and dissolved gas levels), water flows, irrigation contracts, habitat, and hatcheries, as well as requirements for research and monitoring. *Id.* at 9-5. The BiOp noted that the action agencies have legal authority to carry out the RPA measures because the statutes authorizing the Project included fish and wildlife protection as one of the Project purposes. *Id.* It also stated that avoidance of jeopardy and adverse modification of critical habitat is based on successful completion of the RPA measures. *Id.* The RPA included deadlines for many of the actions, with some to be completed in the short-term and others by 2023, the end of the BiOp term. *Id.* at 9-6.

Fish passage was a critical component of the RPA because "lack of passage is one of the single most significant adverse effects on both the fish and their habitat . . . . Specific passage measures are necessary to address the effects of the Project. Therefore, NMFS includes specific passage measures to be completed and operational by set deadlines." *Id.* at 9-33. For instance, the RPA set forth requirements for interim operational changes to quickly improve downstream juvenile salmon and steelhead migration at numerous reservoirs and dams, and also required major structural changes to improve downstream passage at Cougar, Lookout Point, and Detroit

dams by 2023. *Id.* at 9-42 to 9-56. This RPA component was a high priority meant to ensure that downstream passage would happen at three dams in the next fifteen years. *Id.* at 9-52.

Another key component of the RPA addressed water quality, particularly water temperatures and total dissolved gas. *Id.* at 9-60 to 9-68. The BiOp stated that water quality problems were one of the major limiting factors in habitat below the dams, and the RPA required operational and structural changes to address water temperature and dissolved gas problems below the dams in the North Santiam, South Santiam, and Middle Fork Willamette subbasins within set timelines. *Id.* It noted that Lookout Point was a priority for operational changes because water temperatures in the fall cause extremely high Chinook egg mortality in the limited spawning habitat below Dexter Dam. *Id.* at 9-63. The RPA also included measures to protect fish during emergency outages and maintenance at the dams. *Id.* at 9-66, 9-88 to 9-90.

The BiOp concluded that full and timely implementation of the RPA was expected to improve abundance, productivity, spatial structure, and diversity of UWR Chinook salmon and steelhead by providing a package of measures that will address the main negative effects of the Project—lack of effective passage to important habitat, degradation of remaining habitat, adverse flows and temperature, and hatchery actions. *Id.* at 9-90, 9-91. The BiOp noted that the Corps' proposed operation of the Project "mainly provided for further studies" of options to address fish passage and water temperature problems, whereas the RPA required the Corps to implement measures to address these problems over the next fifteen years, which would increase the viability and reduce the risk of extinction for both species. *Id.* at 9-91 to 9-92, 9-108 to 9-109.

The last section of the 2008 BiOp was the Incidental Take Statement, where NMFS explained that continued operation of the Willamette Project under the RPA would result in "take"—e.g., harm—of UWR Chinook salmon and steelhead. *Id.* at 11-6. NMFS estimated the

amount or extent of take it expected from implementation of the RPA, and stated that over time, "incidental take in the forms of adult and juvenile passage mortality and due to adverse water quality and quantity conditions is expected to decline." *Id.* The Incidental Take Statement laid out the maximum amount of mortality expected during juvenile salmon and steelhead downstream passage at each dam, and also the geographic and temporal extent of temperature and dissolved gas harm below the dams from RPA implementation. *Id.* at 11-11 to 11-39.

III. Continued Impacts Since the 2008 Willamette Project Biological Opinion.

Since the 2008 BiOp, some changes have certainly occurred to improve conditions for UWR salmon and steelhead, such as habitat restoration projects, improvements to hatchery practices, and better practices for collecting and transporting adult fish above dams to allow access to upstream spawning habitat.[2] However, significant harm to the species continues to occur from two of the biggest problems identified in the BiOp—poor downstream juvenile migration past dams and harmful water quality and water quantity below the dams. Scientists have conducted much research, and the agencies have weighed many proposals addressing these problems, but the Corps has implemented few actions—much to the frustration of NMFS, State, and Tribal biologists. *See e.g.* Pl. Exs. 4-9, Ex. 10 at 2-3.

A. Lack of Juvenile Downstream Fish Passage

As noted in the RPA, the lack of fish passage past dams for access to and from historic spawning habitat "is one of the single most significant adverse effects on both the fish and their habitat." Pl. Ex. 2 at 9-33; *see also* Pl. Ex. 5 at 9 ("Recovery in Willamette cannot be achieved without downstream fish passage in all 4 basins. This is essential to avoiding jeopardy . . . ."),

[2] Despite improved adult collection and transplant practices, significant stress and injury to fish still occurs during these practices, leading to high pre-spawn mortality above the dams. Schroeder Decl. ¶ 19; Domingue Decl. ¶ 13.

Ex. 6 at 2 ("The most important action to support survival and recovery is to provide passage."). The RPA contained numerous measures to improve passage of fish past the dams, including requiring interim operational changes at dams and longer-term structural changes to improve survival of juveniles migrating downstream through the reservoirs and past the dams. Pl. Ex. 2 at 9-42 to 9-56. The RPA required the Corps to implement interim operational measures starting no later than May 2011 (2008 for Fall Creek dam), and to construct the first structural facility, at Cougar dam, by the end of 2014. *Id.* at 9-42, 9-53.

The August 2011 Recovery Plan for UWR salmon and steelhead reaffirmed the importance of these measures, noting that improving downstream fish passage was one of the top two actions needed in the North Santiam, South Santiam, McKenzie and Middle Fork Willamette subbasins. Pl. Ex. 1 at Ex. Sum 18, 20, 24, 26. It listed impaired downstream passage at the dams as the first key threat limiting viability of the populations in the four subbasins and showed flood control/hydropower dams as the largest source of mortality in those subbasins. *Id.* at 5-47, 5-55, 5-68, 5-73, 6-30, 6-32, 6-36, 6-38, 6-42, 6-44. For those reasons, the Recovery Plan identified as the highest priority actions those to address the direct impacts of flood control/hydropower and dam/reservoir operations, with increased juvenile fish survival prioritized as needing *immediate* action. *Id.* at 7-8, 9-3, 9-4. Although the 2008 BiOp RPA called for operational measures to improve downstream passage to start by May 2011, the August 2011 Recovery Plan noted that implementation of such measures was still needed. *Id.*

The Corps began "initial efforts" to carry out the required interim operational measures for downstream passage in 2011. Pl. Ex. 11 at 1. NMFS commented on the Corps' potential list of measures in May 2011, noting that the Corps had not involved NMFS in the development of this list, and emphasizing that reservoir drawdown operations at Lookout Point dam were the

highest priority for passage measures due to the very high risk of extinction for the Middle Fork population. *Id.* at 1-2. In November 2012, the Corps issued its Operational Measures Evaluation Report ("OMET Report"), where it assessed a variety of interim operational measures for juvenile fish passage and water quality in the four key subbasins. Pl. Ex. 12. These measures looked at different ways of adjusting water storage and flows at each of the dams to improve downstream fish passage, water temperatures, and total dissolved gas levels. *Id.*

With regard to fish passage, the OMET Report considered various operations at each dam to try and improve juvenile migration, especially at the tall "high-head" dams where passage is more difficult. *See id.* at 18, 32-33, 57-88. As explained in detail by Plaintiffs experts, juvenile salmonids face many obstacles when trying to migrate through reservoirs and past dams on their way to the ocean, including difficulty navigating through large reservoirs with little water flow, high rates of predation and infection in reservoirs, difficulty finding turbines or regulating outlets to get through dams, and mortality or injury sustained when going through turbines, regulating outlets, or over the spillway. Schroeder Decl. ¶¶ 18, 20, 23, 25, 26, 29; Domingue Decl. ¶¶ 13-14, 30, 36-37, 42-45, 48-49, 52-53; Johnson Decl. ¶¶ 22-42. Under normal operations for flood control at the high-head dams, the Corps draws down the reservoir to a low level (called the minimum conservation pool) in the fall to provide space to capture high runoff from winter rain events, which is released once the flood threat has passed. Pl. Ex. 12 at 15, 16. In spring, the Corps stores much of the inflow to fill the reservoir, and then keeps it full until drawdown the next fall. *Id.* Reservoirs are generally at minimum conservation pool in December and January, and at maximum level from May through August. *Id.*

The interim operational measures for passage looked at altering those normal operations, such as deeper drawdowns of reservoirs to allow fish better access to regulating outlets rather

than going through turbines (which is generally more harmful), altering the timing of drawdown and/or refill of the reservoir to better match the natural migration timing of the fish, delaying refill of the reservoirs to allow fish more time to access the regulating outlets, or increasing spill over the dams in spring to increase passage. *Id.* at 32-33, 57-88. Drawing down reservoirs also decreases the amount of time it takes juvenile fish to migrate through them to the dam, reducing the likelihood of predation and infection. *See* Schroeder Decl. ¶ 47; Domingue Decl. ¶¶ 59-60; Johnson Decl. ¶¶ 49-51 (discussing benefits of deep drawdowns). The Corps' evaluation considered benefits to the fish as well as whether the operations would reduce power generation, recreation use, or irrigation and municipal water supply. Pl. Ex. 12 at 51-56. NFMS objected to this cost-benefit analysis because "protecting ESA-listed species and their critical habitats, as prescribed by the RPA, is not subject to cost-benefit tests." Pl. Ex. 13 at 4.

Despite assessing multiple operational passage measures for each of the high-head dams, the Corps has implemented few since the OMET report. The 2016 NMFS Status Review of UWR Chinook salmon and steelhead described the continued lack of access to historic spawning habitat as a significant threat impairing the viability of UWR salmon and steelhead in the four key subbasins. Pl. Ex. 3 at 14-17. Implementing effective passage programs and revision of reservoir operations that would promote access to historical spawning and rearing areas above the dams in those four subbasins was still one of the top recommended *future* actions. *Id.* at 19, 47. When listing the RPA actions related to passage that had been implemented so far, the only measure for downstream juvenile passage listed in the 2016 status review was the Fall Creek winter drawdown operation that began in 2011. *Id.* at 27. Although other proposals have been considered, they have not been implemented. NMFS has frequently discussed the Corps' failure to implement passage measures and the need for them in order to avoid jeopardy. Pl. Exs. 4-6.

On Fall Creek, a tributary to the Middle Fork Willamette River, the Corps has been implementing a deep drawdown at Fall Creek dam by drawing the reservoir down almost to the original river channel for a two-week period in the winter. Pl. Ex. 14 at 32. This has improved downstream juvenile migration by allowing the fish to find the regulating outlets more easily and pass through them, and flushing predators out of the reservoir to reduce predation on young salmon. *Id.* This operation has been successful, increasing juvenile survival during downstream passage. *Id.* at 33. However, the regulating outlets are closed from March to October and fish are trapped in the reservoir during that time. Pl. Ex. 15 at 1. In 2016, ODFW recommended an additional deep drawdown in spring that coincides more closely with the natural migration timing of salmon, but the Corps has not done so. *Id.*; Ex. 17 at MFW-14.

For Lookout Point dam, the Corps has refused to conduct interim operations to assist juvenile migration in the Middle Fork Willamette River despite continued pressure from NMFS. As noted above, NMFS stated in 2011 that a reservoir drawdown operation at Lookout Point should be given "highest priority." Pl. Ex. 11 at 2. A recent email from a NMFS biologist stated, "NMFS has repeatedly requested the Corps test operations at [Lookout Point] for fish passage for years—some of the evidence is in these letters and memos from 2011, 2012, 2013, and 2014." Pl. Ex. 9; *see also* Ex. 16 at 3 (memo from NMFS noting multiple requests in 2012-2014 for downstream passage operational measures at Lookout Point). In 2015, the Corps finally issued a report initiating an assessment of operational measures for water temperature and fish passage at Lookout Point. Pl. Ex. 18. Meeting notes attached to the report stated that deep drawdown at Lookout Point in winter should improve passage dramatically. *Id.* at 77.

In June 2017, the Corps issued a draft environmental assessment ("EA") evaluating operational alternatives for downstream fish passage at Lookout Point to address the 2008 BiOp

RPA measures. Pl. Ex. 19 at 1, 6, 23-24. The draft EA recognized that numbers of wild UWR Chinook continue to decline, and the Middle Fork Chinook population is still at very high risk of extinction. *Id.* at 21. The Corps considered several operational measures to improve downstream passage, including a deep drawdown in fall. *Id.* at 7-10. The EA explained that a deep drawdown would improve passage through the regulating outlets, which are safer than turbines for passage. *Id.* at 75-76. It also looked at combining a fall deep drawdown with spring spill operations that would assist fish passing over the spillway in spring. *Id.* at 53.

A study proposal of this combined option proposed deep drawdown in Fall 2017 and 2018, and spill operations in Spring 2018 and 2019 at Lookout Point. Pl. Ex. 20. The deep drawdown at Lookout Point was identified as "the highest priority of operations and one that was expected to provide the greatest benefits for juvenile fish passage and the lowest impacts on reservoir refill." Pl. Ex. 21 at 3. In September 2017, NMFS continued to push for a fall deep drawdown, but the Corps refused. Pl. Ex. 22; Ex. 23 at 6. After seven years of considering deep drawdown as a potential operational measure for fish passage at Lookout Point, the Corps abruptly decided in 2018 that it did not have authority to forego power production for a month to improve fish migration. Pl. Ex. 21 at 3. It also could not conduct the spring spill operations in 2018 because water levels were too low in the reservoir. *Id.* at 2. The Corps has not conducted downstream passage measures at the other dams in the Middle Fork subbasin either, stating in its 2018 Fish Operations Plan[3] that "[n]o specific operations are performed at Dexter, Lookout Point, or Hills Creek to support juvenile downstream fish passage." Pl. Ex. 17 at MFW-14.

Similarly, in the McKenzie subbasin, the Corps has implemented minimal downstream passage operational measures at Cougar dam. Under normal operations, downstream passage

[3] The RPA required the Corps to prepare and update a Fish Operations Plan to coordinate and minimize the impact of the operation and maintenance of the Willamette Project facilities.

through Cougar dam is poor, with low survival rates of juvenile fish. Pl. Ex. 24 at 1; Ex. 25 at 1. The Corps tested a deep drawdown operation in December 2012 that lowered the level of the reservoir to the regulating outlets, and survival was better under that operation. Pl. Ex. 26 at 28, 38. The Corps planned to conduct further December deep drawdown operations at Cougar dam, as explained in a November 2013 draft EA assessing operational measures for Cougar, Fall Creek, and Hills Creek dams. Pl. Ex. 27 at 10-11. However, the Corps did not follow through with the drawdowns at Cougar or Hills Creek, issuing a final EA only for Fall Creek. Pl. Ex. 14. In 2016, NMFS recommended the Corps study passage during a planned maintenance operation of delayed refill, *see* Pl. Ex. 28 at 2, but the Corps failed to do so. In 2017, NMFS supported a plan to prioritize use of the regulating outlets over the turbines to facilitate passage, but that plan did not include a deep drawdown that would allow fish easier access to the outlets. Pl. Ex. 29. According to the Corps' 2018 Fish Operations Plan, it "does not currently operate Cougar dam specifically for juvenile fish passage" even though it listed prioritizing flows through a regulating outlet as a measure that could be used. Pl. Ex. 17 at MCK-9.

In the South Santiam subbasin, Green Peter dam is the high-head dam that cuts off access to a "large portion" of spawning habitat in the subbasin. Pl. Ex. 30 at 2. The Corps stopped transporting adult salmon and steelhead above the dam in the 1980's. *Id.* NMFS determined that accessing that habitat is important for both species, and the Corps must conduct studies as a first step to that reintroduction. Pl. Ex. 3 at 16-17; Ex. 10 at 2-3; Ex. 30, Ex. 31. Those studies consist of planting adult hatchery salmon above Green Peter dam and researching spawning success as well as behavior and success of juveniles migrating downstream to evaluate passage at Green Peter. Pl. Ex. 10 at 2-3; Exs. 30-31. The Corps has refused to do the outplanting. *Id.*

Finally, the Corps is also far behind schedule with long-term changes to improve

downstream passage. It did not complete its assessment of options for long-term passage until 2015, three years later than required under the RPA. Pl. Ex. 2 at 9-58; Ex. 32. A structural passage facility is not yet built and operational at Cougar dam despite a 2015 deadline. Pl. Ex. 2 at 9-53; Ex. 33. The Corps decided in 2015 that it would stop planning for a downstream passage facility at Lookout Point dam. Ex. 32 at 4-2. And the current estimate for completing construction of a facility at Detroit dam is 2028. Pl. Ex. 33. Thus, the Corps will not fulfill NMFS's assumption in the RPA that all three facilities would be built by 2023. Pl. Ex. 2 at 9-52.

B. Poor Water Quality and Quantity Below Dams

As recognized by NMFS in the 2008 BiOp, "unacceptable water temperature and TDG [total dissolved gas] downstream of the Project dams" is also a significant problem for UWR Chinook salmon and steelhead. *Id.* at 9-60, 9-61; *see also* Ex. 34 at 7 (Water Quality Report stating that water temperatures below Project dams have been identified as one of the primary limiting factors preventing recovery of UWR Chinook and steelhead). Like for fish passage, the RPA required interim operational measures by 2010/2011 to improve water quality below dams, as well as major long-term changes to at least one dam by 2018, with Detroit dam being top priority. Pl. Ex. 2 at 9-61 to 9-65. The BiOp found alteration of natural water flows are a significant effect of the dams and included numerous measures in the RPA to address that, such as downstream flow objectives and flow management requirements. *Id.* at 9-10 to 9-25.

The Corps assessed operational measures to address water quality in the 2012 OMET Report. Pl. Ex. 12 at 34. The report explained that "construction and operation of the Corps Willamette dams have altered natural flow and water temperature regimes, disrupting the natural cues for migration, spawning, and emergence timing" for UWR salmon and steelhead. *Id.* at 19. Under normal Project operations, the Corps runs water through the turbines to generate power.

Id. When the reservoir is full in summer, water released through the turbines is from deep in the reservoir and thus colder than natural flows. *Id.* at 19-20. In fall and winter, when the reservoir levels drop and warm water closer to the surface of the reservoir is released, temperatures downstream become warmer than normal. *Id.* These changes affect the migration timing of adult salmon and steelhead, spawning success below the dams, and the timing of fry emerging from eggs. *Id.* at 21-25; Ex. 34 at 7-8. Additionally, water falling from the dam to the river below absorbs gases from the air, creating high TDG levels in water downstream of the dams, which is also hazardous for adult and juvenile fish. Pl. Ex. 34 at 8; Ex. 35 at 4-5. *See also* Schroeder Decl. ¶¶ 16-17, 20-21, 23-25, 27, 30; Domingue Decl. ¶¶ 15-31, 38-41, 46-47, 50-51, 54-55 (discussing harm to UWR salmonids from Project impacts on water quality).

The Corps can alter downstream water temperatures and TDG by adjusting how water gets through a dam, i.e. via surface spill near the top of the dam, through turbines, or through regulating outlets that are often the lowest outlets. Pl. Ex. 12 at 21; Ex. 35 at 1. The Corps built a water temperature control structure at Cougar dam in 2005 that blends water from different levels of the reservoir to manage downstream temperatures. Pl. Ex. 12 at 34; Ex. 34 at 44. The Corps also implements operational measures at Detroit dam and Fall Creek dam to help with downstream temperatures and TDG levels. Pl. Ex. 34 at 104; Ex. 36 at 110. The 2012 OMET report considered operational measures at Green Peter and Lookout Point to improve downstream water temperature, but the Corps is not conducting such measures at those dams. Pl. Ex. 12 at 66, 70-72; Ex. 34 at 105; Ex. 36 at 111; Ex. 17 at SS-9, MWF-15. Using the spillway or regulating outlets rather than turbines reduces power generation. Pl. Ex. 12 at 60, 66, 71.

Water temperatures in the Middle Fork Willamette are a big problem, with temperatures in fall severely impairing salmon spawning and incubation and contributing to adult pre-spawn

mortality. Pl. Ex. 18 at 40-42; Ex. 34 at 63-66, 73-75, 78-79, 105; Ex. 36 at 64-68, 76-78, 82-83, 111; Schroeder Decl. ¶ 29; Domingue Decl. ¶ 54. Temperatures below Dexter are influenced primarily by operation of Lookout Point dam. Pl. Ex. 18 at 30. Yet the Corps conducts no temperature control operations at Lookout Point. Pl. Ex. 17 at MFW-15; Ex. 34 at 109; Ex. 36 at 114. It previously attempted such operations using the spillway and turbines, but concluded they were not very helpful at achieving temperature targets. Pl. Ex. 18 at 30, 60; Ex. 34 at 59. The Corps has not used the regulating outlets to help with temperature control even though reservoir water at the level of those deeper outlets is cooler than at the level of the turbines in summer and early fall, and temperatures below Dexter exceed targets during much of that time. Pl. Ex. 34 at 59, 66, 68; Ex. 36 at 68, 70.

In the North Santiam and South Santiam Rivers, high levels of TDG below Big Cliff and Foster dams often create adverse effects to fish. Pl. Ex. 23 at 7; Ex. 34 at 25-28, 41-42; Ex. 35; Ex. 36 at 27-29, 44; Ex. 37; Ex. 38. Despite operational measures to try and reduce this impact, elevated TDG was a recurring problem in 2015-2017. *Id.* Water temperature also remains a problem in the North Santiam and McKenzie Rivers below the dams even with the Corps' temperature control measures, exceeding temperature targets particularly in fall during salmon spawning and incubation. Pl. Ex. 34 at 1, 21-22, 46-48, 105; Ex. 36 at 1, 22-24, 49, 110; Schroeder Decl. ¶¶ 24, 27. The long-term structural change at Detroit dam to improve downstream temperature is still in the planning phase despite the RPA deadline of 2018 for completion. Pl. Ex. 2 at 9-65; Ex. 36 at 113. Lastly, the Corps conducts no temperature control measures at Green Peter dam in the South Santiam even though temperatures below that dam are frequently outside targets. Pl. Ex. 34 at 31, 33-36, 105-106; Ex. 36 at 35-38, 111.

Aside from the water quality problems of normal dam operations, unplanned events—

such as power outages or mechanical failures—and routine maintenance of the dams cause additional water quality issues. The RPA required the Corps to develop protocols to deal with emergency events and schedules for maintenance to minimize impacts to fish. Pl. Ex. 2 at 9-36 to 9-38, 9-66 to 9-67. The Fish Operations Plan contains maintenance target periods for each of the dams and fish facilities, and protocols for emergency situations. *See e.g.* Pl. Ex. 17 at NS-12-21. The Corps frequently fails to abide by these schedules and protocols, often causing adverse impacts to salmon and steelhead, particularly excessive TDG. Pl. Ex. 34 at 27; Ex. 39.

Finally, altered water flows still impair UWR salmon and steelhead and their habitat below the dams. Schroeder Decl. ¶¶ 16-17; Domingue Decl. ¶¶ 15-21.

Importantly, when assessing operational measures for both fish passage and water quality and quantity, the Corps has given equal or even greater weight to other uses of the Project—such as recreation and power production—over benefits to the threatened fish. *See e.g.* Pl. Ex. 12 at 56, 60-62, 67, 78, 96 (weighing costs and benefits when assessing interim operational measures); Ex. 34 at 8, 10, 20 (weighing impacts to reservoir recreation and power production when implementing temperature control measures); Ex. 21 at 3 (rejecting deep drawdown at Lookout Point because it would reduce power production); Ex. 40 (Corps expected to meet demands for power, irrigation, and other uses but not fish flows in low water year). By failing to prioritize the needs of UWR Chinook salmon and steelhead, the Corps is further contributing to the harm to these species from the operation of the Project. Because of the Corps' ongoing violations of the ESA, an injunction is needed to reduce these harms until NMFS issues a new biological opinion.

ARGUMENT

I. FOR ESA INJUNCTIONS, THE EQUITIES AND PUBLIC INTEREST ALWAYS TIP IN FAVOR OF THE SPECIES.

A plaintiff seeking a preliminary injunction must show "he is likely to succeed on the

merits, that he is likely to suffer irreparable harm in the absence of preliminary relief, that the balance of equities tips in his favor, and that an injunction is in the public interest." *Winter v. Nat. Res. Def. Council, Inc.,* 555 U.S. 7, 20 (2008).

In ESA cases, however, courts may not apply traditional equitable balancing because the "plain intent of Congress in enacting the statute was to halt and reverse the trend toward species extinction, whatever the cost," and thus "the balance has been struck in favor of affording endangered species the highest of priorities . . . ." *Tenn. Valley Auth. v. Hill*, 437 U.S. 153, 184, 194 (1978). The Ninth Circuit recently reaffirmed that in ESA cases, the equities and public interest factors always tip in favor of the protected species. *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 886 F.3d 803, 817 (9th Cir. 2018). Because Plaintiffs are likely to succeed on the merits and likely to suffer imminent irreparable harm, injunctive relief is warranted here.

II. PLAINTIFFS ARE LIKELY TO SUCCEED ON THE MERITS.

A. ESA Standards

The ESA contains substantive and procedural measures to protect threatened and endangered species from extinction. Under ESA Section 7, federal agencies have a duty to ensure that their actions are not likely to jeopardize the continued existence of threatened or endangered species or adversely modify the species' critical habitat.[4] 16 U.S.C. § 1536(a)(2). Jeopardize means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of the species in the wild by reducing the reproduction, numbers, or distribution of the species. 50 C.F.R. § 402.02. The ESA also prohibits "take" of threatened and endangered species, where "take"

[4] Critical habitat is occupied or unoccupied habitat that contains physical or biological features essential to the conservation of the species and which may require special management considerations or protection. 16 U.S.C. §§ 1532(5), 1533(a)(3).

includes harming, wounding, killing, or harassing a listed species, or causing significant habitat degradation that kills or injures wildlife by significantly impairing essential behaviors such as breeding, feeding, and sheltering. 16 U.S.C. §§ 1538, 1532(19); 50 C.F.R. §§ 17.3, 223.203.

To ensure compliance with these substantive duties, the ESA imposes procedures requiring a federal agency to consult with NMFS over any action by the agency that may affect a threatened or endangered marine species, such as salmon or steelhead. 16 U.S.C. § 1536(a)(2). For an action that is likely to adversely affect a listed species or their critical habitat, NMFS prepares a biological opinion to determine if the adverse effects are likely to jeopardize the continued existence of the species or adversely modify its critical habitat. 50 C.F.R. § 402.14(g)(4). If NMFS determines that the action will cause such a result, it shall propose one or more reasonable and prudent alternative actions that could go forward without causing that result. 16 U.S.C. § 1536(b)(3)(A); 50 C.F.R. § 402.14(g)(5), (h)(3). Also, if the action is likely to "take" a threatened or endangered species, NMFS can authorize that take if it is incidental to an otherwise lawful activity and will not jeopardize the species. 16 U.S.C. § 1536(b)(4). Such an authorization occurs through an incidental take statement within a biological opinion. *Id.*

During the consultation process, the action agency must avoid making any irreversible or irretrievable commitment of resources with respect to the agency action which has the effect of foreclosing the formulation or implementation of any reasonable and prudent alternative measures that would avoid jeopardizing the species or adversely modifying critical habitat. 16 U.S.C. § 1536(d). Once consultation is completed, reinitiation of consultation must occur if the amount or extent of taking specified in the incidental take statement is exceeded, new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered, or the identified action is subsequently

modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion. 50 C.F.R. § 402.16.

B. Defendants' Delayed Reinitiation of Consultation Requires a Remedy.

The first claim in Plaintiffs' Complaint concerned the agencies' failure to reinitiate consultation over the Willamette Project when changed circumstances and new information triggered the need to reinitiate under ESA regulation 50 C.F.R. § 402.16; *see* Complaint ¶¶ 82-84, 91-95. Even though the agencies have now formally reinitiated consultation, *see* Pl. Ex. 41 (letter from Corps to NMFS reinitiating consultation), Plaintiffs' claim is not moot because the Court can still grant effective relief in the form of an injunction that would help alleviate harm to the species while the agencies complete the lengthy consultation process. *See Hoopa Valley Tribe v. Nat'l Marine Fisheries Serv.*, 230 F. Supp. 3d 1106, 1131-32 (N.D. Cal. 2017).

In *Hoopa Valley Tribe v. National Marine Fisheries Service,* the court held that it could order injunctive relief to remedy a reinitiation of consultation claim even after the agencies had started a new consultation because their delay in reinitiating was a "substantial procedural violation" of the ESA. *Id.* at 1133-35 (citing *Wash. Toxics Coal. v. EPA,* 413 F.3d 1024, 1034 (9th Cir. 2005); *Pac. Rivers Council v. Thomas,* 30 F.3d 1050, 1056-57 (9th Cir. 1994)). Like here, *Hoopa Valley Tribe* involved impacts to salmon from dams and water diversions. Violations of the incidental take statement triggered the need to reinitiate consultation there, but the agencies failed to do so for more than two years, causing increased harm that could be remedied by an injunction ordering additional protective measures for salmon until consultation was completed. *Id.* at 1131-32, 1134-35, 1146.

The situation here is similar because the Corps and NMFS should have reinitiated consultation several years ago when it was clear that many of the requirements to improve

downstream juvenile fish passage and water quality had not occurred or would not occur under the timelines prescribed in the 2008 BiOp RPA. The 2008 BiOp explained that two of the most limiting factors for UWR Chinook salmon and steelhead were lack of downstream fish passage, and problems with water quality—particularly water temperatures and dissolved gas levels below the dams. Pl. Ex. 2 at 7-6 to 7-14, 8-4 to 8-5, 9-33 ("for UWR Chinook salmon and UWR steelhead, lack of passage is one of the single most significant adverse effects on both the fish and their habitat"), 9-61 ("Water quality problems are one of the major limiting factors" below dams in the North Santiam, South Santiam, and Middle Fork Willamette subbasins).

To address those key limiting factors, the RPA directed the Corps to begin carrying out interim operational measures to improve downstream passage through reservoirs and dams by May 2011, including conducting a draw down at Fall Creek dam beginning in 2008. *Id.* at 9-42, 9-43. It also required major structural changes at three dams for long-term downstream passage improvement, with changes at Cougar dam to be initiated in 2010 and constructed by December 2014, changes to Lookout Point dam to be initiated in 2012 and constructed by December 2021, and changes to Detroit dam to be initiated in 2015 and constructed by December 2023. *Id.* at 9-53 to 9-55. Similarly, the RPA called for interim operational changes to improve water quality, with simpler measures to be implemented by April 2010 and more complex measures to be implemented by May 2011, noting that Lookout Point and Hills Creek dams were a priority. *Id.* at 9-62, 9-63. A long-term water temperature control structure was required for at least one dam, with Detroit dam the highest priority, to be constructed by December 2018. *Id.* at 9-65.

NMFS's conclusion that the RPA would avoid jeopardy to the species and adverse modification of critical habitat was "based on the benefits attributed to successful completion of these measures." *Id.* at 9-5. The BiOp stated that "[s]pecific passage measures are necessary to

address the effects of the Project. Therefore, NMFS includes specific passage measures to be completed and operational by set deadlines." *Id.* at 9-33. Likewise, the BiOp discussed the importance of quickly implementing interim water quality measures. *Id.* at 9-61. *See also id.* at 9-91, 9-105 to 9-107, 9-108, 9-114 to 9-116 (relying on timely completion of RPA measures, particularly for fish passage, to conclude species' status will improve and Project operations will not cause jeopardy). The BiOp specifically stated that if the Corps determined it was infeasible to complete major elements of the RPA—such as the downstream passage structures—and did not identify other alternatives that could be implemented within the same timelines, reinitiation of consultation would be necessary. *Id.* at 9-58, 9-59. Yet, the agencies did not reinitiate consultation until April 2018 despite knowing years ago that the Corps would not meet the required timelines for the downstream passage and water quality measures in the RPA. *See* Pl. Exs. 4-6 (2013-2015 memos discussing delays in key RPA measures).

Certainly, by the end of 2015, it was clear that the effects of the action were greater, and would continue to be greater, than what the BiOp had considered, triggering the need to reinitiate. At that point, the Cougar juvenile fish passage facility had not yet been built and was at least seven years away, plans for juvenile passage and temperature facilities at Detroit were delayed several years, and the Corps had abandoned plans for Lookout Point adult and juvenile fish passage facilities. *See supra* pp. 17-18. The Corps had also failed to implement operational measures to improve downstream passage and water quality at many of the dams, which were required by 2011. *See supra* pp. 12-20. Due to the greater than expected harm to the fish from the Corps' continuing operation of the Willamette Project, delaying reinitiation until 2018 was a substantial procedural violation of the ESA that warrants injunctive relief. *See Hoopa Valley Tribe,* 230 F. Supp. 3d at 1134-35.

C. The Corps' Continued Operation of the Willamette Project is Violating ESA Sections 7 and 9.

The Corps' ongoing operation and maintenance of the Willamette Project violates its substantive duties under ESA Sections 7 and 9. *See* 16 U.S.C. §§ 1536(a)(2), 1538. While the Corps and NMFS conduct a new consultation, the Corps must ensure that its ongoing actions are not likely to jeopardize or unlawfully "take" the listed species pending completion of a new biological opinion. *Wash. Toxics Coal.,* 413 F.3d at 1034-35; *Def. of Wildlife v. Martin,* 454 F. Supp. 2d 1085, 1095-97 (E.D. Wash. 2006); *Pac. Coast Fed'n of Fishermen's Ass'ns v. Gutierrez,* 606 F. Supp. 2d 1195, 1203 (E.D. Cal. 2008); *see also Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.,* 184 F. Supp. 3d 861, 950 (D. Or. 2016) (retaining jurisdiction during consultation process to ensure Defendants developed mitigation measures to avoid jeopardy). Here, the ongoing operation of the Willamette Project will continue to jeopardize UWR Chinook salmon and steelhead and adversely modify their critical habitat.

When assessing jeopardy, the Court must look at the Project's effects on the species' survival *and* recovery because "a species can often cling to survival even when recovery is far out of reach." *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.,* 524 F.3d 917, 931-32 (9th Cir. 2008); *see also Wild Fish Conservancy v. Salazar,* 628 F.3d 513, 527 (9th Cir. 2010) ("even before a population is extinguished, it may reach a point at which it is no longer recoverable"). As this Court explained: "the longer a species remains at low population levels, the greater the probability of extinction from chance events, inbreeding depression, or additional environmental disturbance." *NWF v. NMFS,* 184 F. Supp. 3d at 891 (citing ESA Consultation Handbook at 4-21). With a species that remains at low abundance, impeding its progress toward recovery reduces its likelihood of survival. *Id; see also Wild Fish Conservancy,* 628 F.3d at 526-29 (action that contributes to the decline of a species already at low abundance impairs its survival).

Where baseline conditions jeopardize a species, an agency may not take actions that deepen that jeopardy by causing additional harm. *NWF v. NMFS,* 524 F.3d at 929-30. Similarly, an agency cannot maintain status quo operations when there is already severely degraded critical habitat that does not allow for recovery of the species, and which will be adversely modified from further operations. *Id.* at 935; *NWF v. NMFS,* 184 F. Supp. 3d at 930. Finally, failing to implement vital RPA measures that are necessary to avoid jeopardy violates the agency's duty under Section 7. *Sierra Club v. Marsh,* 816 F.2d 1376, 1386 (9th Cir. 1987).

NMFS determined in the 2008 BiOp that the Corps' proposed operation of the Willamette Project was likely to cause jeopardy to UWR Chinook salmon and steelhead and adverse modification of their critical habitat, with two of the primary limiting factors for the species' survival and recovery being lack of passage to and from historical spawning habitat and adverse impacts to water quality. *See supra* pp. 7-10. To allow continued operation of the Project, NMFS issued an RPA that concluded avoiding jeopardy and adverse modification of critical habitat is contingent upon on the Corps' successful completion of the RPA measures. *See supra* pp. 9-10. Critical components of the RPA were interim and long-term measures to address downstream fish passage and water quality. *Id.* NMFS and ODFW's Recovery Plan and the Corps' own Water Quality reports reiterated the need to address downstream juvenile migration past the dams and water quality impacts to achieve recovery of the species. *See supra* pp. 12, 18. NMFS and ODFW have explained that full implementation of the RPA, especially measures to improve passage at dams, is needed to avoid jeopardy. Pl. Ex. 5 at 9; Ex. 6 at 2; Ex. 7. The agencies noted the importance of the Middle Fork Willamette population in particular for recovery of UWR Chinook. Pl. Ex. 2 at 4.2-9, 5.2-31; Ex. 23 at 3.

The Corps, however, has failed to implement interim RPA measures for downstream

passage and water quality at many of the dams and is far behind schedule for long-term measures. *See supra* pp. 12-21. NMFS's 2016 Status Review explained that lack of access to spawning habitat is still a significant threat impairing the viability of these species, and operational measures were still needed. *See supra* p. 14. Notably, no fish passage or water quality measures are occurring at the dams on the Middle Fork despite the importance of that Chinook population and its very high risk of extinction. *See supra* pp. 6, 14-16, 19-20; Pl. Ex. 17 at MFW-14,15. No downstream passage measures are occurring at Cougar dam even though the McKenzie Chinook population is a "core" and "genetic legacy" population. *See supra* pp. 6, 16-17. Water temperatures and dissolved gas are still frequent problems below the dams, with temperatures exceeding fall spawning and incubation targets in all four subbasins. *See supra* pp. 19-20. Thus, the Corps' operations continue to impair species that were already in jeopardy and habitat that was already degraded. *See* Schroeder Decl. ¶¶ 30, 41-45, 59-62; Domingue Decl. ¶¶ 9-12, 75; Johnson Decl. ¶¶ 15, 17-21, 43-47, 67 (confirming harm from ongoing operations).

The declining trend of both species over the last ten years is further evidence that the Corps' operations are continuing to impede progress toward recovery of these species. The Recovery Plan explained that species viability is based on four factors: abundance, productivity, spatial distribution, and diversity. Pl. Ex. 1 at 3-1. For recovery, each of the UWR Chinook populations and three of the four steelhead populations need to lower their risk of extinction. *Id.* at 6-2, 6-3. As discussed in the 2016 Status Review and the declaration of Kirk Schroeder, the viability of these species has decreased due to declines in abundance and continued poor access to and from historic spawning habitat that impairs reproduction, distribution, and diversity of the species. *See supra* pp. 3-4; Schroeder Decl. ¶¶ 31-36, 41-46. The risk of extinction for these species is likely even greater now than in 2008. *See supra* p. 4; Pl. Ex. 31 at 2; Ex. 42 at 3

(noting potential need to uplist species to endangered status). The Corps' promise to continue implementing the RPA, *see* Pl. Ex. 41, is not enough to ensure against jeopardy and adverse modification of critical habitat given the decline of these species, the agency's past failure at implementing key RPA measures, and its lack of plans to conduct future operational downstream passage and water quality measures at many of the dams. [5]

The Corps' ongoing actions will also cause unlawful "take." Violation of the conditions of an Incidental Take Statement abrogates the safe harbor provision of that statement, leaving the agency liable for violating ESA Section 9. *Or. Nat. Res. Council v. Allen,* 476 F.3d 1031, 1039-40 (9th Cir. 2007); *Or. Nat. Desert Ass'n v. Tidwell,* 716 F. Supp. 2d 982, 999, 1005 (D. Or. 2010). NMFS stated in the 2008 BiOp that incidental take would occur as a result of the continued operation of the Willamette Project dams and reservoirs under the RPA. Pl. Ex. 2 at 11-6. NMFS authorized the amount and extent of take that it estimated would result from implementing the RPA and explained that, "[a]s the RPA and Proposed Action are implemented, incidental take in the forms of adult and juvenile passage mortality and due to adverse water quality and quantity conditions is expected to decline." *Id.* at 11-6 to 11-7. The Service concluded that because it had determined that the RPA was not likely to result in jeopardy to the species, the effect of the amount and extent of take authorized in the incidental take statement was already fully considered. *Id.* at 11-10. Importantly, when setting the Terms and Conditions of the Incidental Take Statement, NMFS stated that "[t]hese terms and conditions constitute no more than minor changes because they only provide further elaboration on the more general

[5] Although ESA § 1536(d)'s prohibition on making irreversible and irretrievable commitments of resources during consultation "does not readily apply" when an agency's ongoing actions are the very thing harming the listed species, courts' interpretation of that provision also supports the need for an injunction here where the species are in a perilous state and face further harm from status quo operations. *Hoopa Valley Tribe,* 230 F. Supp. 3d at 1135-36; *Wash. Toxics Coal.,* 413 F.3d at 1034-35; *Pac. Rivers Council v. Thomas,* 936 F. Supp. 738, 745-50 (D. Idaho 1996).

measures in the [Proposed Action] and RPA." *Id.* at 11-40.

NMFS's statements make clear that one of the conditions of the incidental take statement was that the Corps would implement the RPA. Failure to do so would allow for more injury and mortality to UWR salmon and steelhead than was authorized, particularly passage mortality and harm from habitat degradation. *See id.* at 11-6 to 11-7. Because the Corps has failed to implement many crucial aspects of the RPA, it has not fulfilled this condition of the incidental take statement, and thus is liable for "take." As discussed above and recognized by NMFS, the operation of the Project dams and reservoirs results in fish mortality and injury as well as habitat degradation that significantly impairs the species' essential behaviors, in violation of ESA Section 9. *Id.*; 16 U.S.C. § 1538; 50 C.F.R. §§ 17.3.

III. CONTINUED OPERATION OF THE WILLAMETTE PROJECT IS LIKELY TO CAUSE IRREPARABLE HARM.

Ongoing operation of the Willamette Project will cause irreparable harm to UWR Chinook salmon and steelhead while the agencies complete a new consultation. The situation here is even more dire than what salmon and steelhead face in the Columbia River, where this Court has repeatedly issued injunctions, twice affirmed by the Ninth Circuit, to modify dam operations while the Corps and NMFS re-do ESA consultations. *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.,* 2005 WL 1398223 (D. Or. June 10, 2005), *aff'd by* 422 F.3d 782 (9th Cir. 2005); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.,* 839 F. Supp. 2d 1117 (D. Or. 2011); *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.,* 2017 WL 1829588 (D. Or. April 3, 2017), *aff'd by* 886 F.3d 803 (9th Cir. 2018). In 2005, the Ninth Circuit recognized the irreparable harm that would occur from status quo operations at Columbia River dams due to high mortality of juveniles migrating downriver. *NWF v. NMFS,* 422 F.3d at 795. Because those operations would cause irreparable harm to the threatened fish, the Ninth Circuit upheld an

injunction requiring more spill over the dams to reduce harm to juvenile migrants. *Id.* at 797.

In the most recent injunction, the Ninth Circuit noted the highly precarious status of the species, that their continued low abundance made them vulnerable to extinction, and that ample evidence showed continued operation of the dams would cause them further harm. *NWF v. NMFS,* 886 F.3d at 818-22. Therefore, it upheld the District Court's injunction ordering the Corps to spill more water over the dams to assist downstream migration of juvenile salmon and steelhead. *Id.* at 817. Notably, the District Court explained that under the ESA, it does not weigh equities such as "potential implications on the power system or costs to the Federal Defendants" against the benefits to the fish. *NWF v. NMFS,* 2017 WL 1829588, at *6.

Other courts have recently imposed injunctions to remedy ESA violations of failure to reinitiate consultation and unlawful "take" where there would be irreparable harm to listed fish from ongoing operations of dams. *Hoopa Valley Tribe,* 230 F. Supp. 3d at 1137-42, 1144 (requiring certain water flows from Klamath Project to protect listed salmon until consultation completed); *Wishtoyo Found. v. United Water Conservation Dist.,* No. 2:16-cv-3869-DOC-PLA, ECF # 219 (C.D. Cal. Oct. 4, 2018) (imposing injunction to remedy "take" of steelhead from operation of dam and water diversions) (Pl. Ex. 43).

Here, UWR salmon and steelhead are in a highly precarious state and vulnerable to extinction due to their low abundance and recent declines. As discussed in this brief and by Plaintiffs' experts, operation of the Willamette Project continues to cause irreparable harm by impeding access to upstream spawning habitat, causing mortality and injury to adults transported above the dams and juveniles migrating downstream, and degrading water quality below dams that impairs spawning, incubation, and migration. Schroeder Decl. ¶¶ 15-45, 59-63; Domingue Decl. ¶¶ 9-55, 75-76; Johnson Decl. ¶¶ 14-47, 67-68. Irreparable harm to UWR salmon and

steelhead translates to irreparable harm to Plaintiffs. *See* Thomas Decl. ¶¶ 6-15; Derry Decl. ¶¶ 6-16; Dose Decl. ¶¶ 5-11; Gowell Decl. ¶¶ 5-21 (all discussing injury to themselves due to harm to the species).[6] As in the cases discussed above, an injunction is needed here to reduce the harm to these imperiled species until the agencies complete their consultation.

IV. THE CORPS MUST ACT NOW TO IMPROVE DOWNTREAM JUVENILE MIGRATION AND WATER QUALITY PENDING A NEW CONSULTATION.

A. The Corps has Authority to Prioritize Salmon and Steelhead Needs Over Other Uses of the Project.

Plaintiffs are seeking injunctive measures that would prioritize fish needs over other uses of the Willamette Project without adversely affecting flood control or other public safety concerns. The Corps has discretion to operate the Project in such a way.

The Ninth Circuit and this Court have recognized the Corps' discretion to manage dams on the Columbia River for the benefit of threatened fish. *NWF v. NMFS,* 524 F.3d at 928-29; *Nat'l Wildlife Fed'n v Nat'l Marine Fisheries Serv.,* 2005 WL 1278878, at *9-10 (D. Or. May 26, 2005). The Flood Control Act authorizing those dams imposed broad goals but did not dictate how the Corps must fulfill those goals, giving the agency considerable discretion in choosing what specific actions to take. *NWF v. NMFS,* 524 F.3d at 928-29. Because of the Corps' management discretion, it must operate the dams in compliance with the ESA's no-jeopardy mandate regardless of the expense or burden. *Id.* at 929. Thus, these courts have ordered the Corps to conduct operations to benefit fish at the expense of other project purposes like hydropower. *NWF v. NMFS*, 2017 WL 1829588, at *6, *aff'd,* 886 F.3d 803.

The same reasoning applies to the Willamette Project. The Willamette Project was authorized by Flood Control Acts—including the one that applied to the Columbia River dams—

[6] These plus the Declaration of Marlies Wierenga also demonstrate Plaintiffs' standing.

that impose broad goals and do not mandate specific dam operations. *See supra* p. 4; Flood Control Act of 1950, Pub L. No. 81-516, § 204, 64 Stat. 163, 178-79 (1950). Accordingly, the Corps has discretion to alter management of the Willamette dams to benefit ESA-listed species at the expense of other uses—including power production—just as it does with the Columbia dams.

B. The Corps Must Take Actions to Improve Conditions for Fish.

Plaintiffs are seeking interim measures to immediately reduce harm to highly imperiled populations of UWR salmon and steelhead while the agencies complete consultation. Plaintiffs' experts explain that, although not sufficient for recovery, these measures will benefit the fish in the short-term. Schroeder Decl. ¶¶ 46-63; Domingue Decl ¶¶ 56-76; Johnson Decl. ¶¶ 48-68.

Plaintiffs seek an order from the Court that directs the Corps to prioritize needs of UWR salmon and steelhead over all other authorized purposes of the Willamette Project as long as the actions do not impair flood control or human health and safety.[7] These other purposes include, but are not limited to, power production, recreation, and irrigation. As part of this prioritization, Plaintiffs seek the following specific measures:

- Draw down Detroit reservoir to the regulating outlets (1,370') by November 15 and hold until December 15, and prioritize use of the regulating outlets over turbines for that time.
- Draw down Cougar reservoir to the regulating outlets (1,505') by November 15 and hold until December 15. Maintain Cougar reservoir at minimum conservation pool (1,532') from March 1 to May 1 and prioritize use of regulating outlets over turbines for that time.
- Draw down Lookout Point reservoir to the regulating outlets (750') by November 15 and hold until December 15. Conduct ungated spill at Lookout Point dam for 2-4 weeks in spring.
- Conduct an additional draw down at Fall Creek dam to 685' from April 1 to June 30.
- Re-model OMET alternatives: drawdown of Detroit reservoir from fall through April, run-of-the-river operation at Cougar dam, and run-of-the-river operation at Lookout Point dam without assuming that the Corps must fulfill all authorized purposes of the Project.

[7] The human health and safety exception includes protecting Salem's drinking water supply.

- Outplant adult hatchery Chinook salmon above Green Peter dam to study spawning success and juvenile downstream migration through Green Peter.

- Reduce water temperatures below Lookout Point and Detroit dams in fall-winter by using the lowest regulating outlets to discharge colder water during draw down operations.

- Adopt and strictly follow maintenance schedules and emergency protocols provided by NMFS and ODFW to reduce water quality impacts during such events.

- The Corps must coordinate with NMFS and ODFW on implementation of the above measures, monitoring of the measures, adjustments of measures based on that monitoring, and other interim measures the Corps should take to benefit UWR salmon and steelhead.

- The Corps must keep Plaintiffs and the Court apprised of its actions and the results, and the Court will resolve any disputes that arise over these measures.

More details on these measures are provided in the accompanying Proposed Order. Pl. Ex. 44.

Many of these measures are similar to those NMFS and ODFW supported and the Corps analyzed but failed to execute. *See* Pl. Ex. 12 at 63-64, 76-78, 83-85 (OMET report); Ex. 45 (Detroit); Ex. 27 at 10-11, 46-47 (Cougar); Exs. 19-20; Ex. 21 at 3; Ex. 22 (Lookout Point); Exs. 15, 48 (Fall Creek); Ex. 10 at 2-3; Exs. 30-31 (Green Peter). Plaintiffs' experts support these measures as being beneficial, at least on an interim basis, to UWR salmon and steelhead. Schroeder Decl. ¶¶ 46-63; Domingue Decl ¶¶ 56-76; Johnson Decl. ¶¶ 48-68. Given the dire status of these species, and the lack of any progress toward recovery over the last ten years, immediate injunctive relief is necessary to try and avert extinction until more drastic long-term measures are developed and implemented. UWR salmon and steelhead cannot wait through more agency delay; they will be gone if the Corps does not make significant changes now to its operation of the Willamette Project.

CONCLUSION

For the foregoing reasons, Plaintiffs respectfully request the Court grant their motion for preliminary injunction and order their requested relief.

Dated: November 30, 2018

Respectfully submitted,

/s/Lauren M. Rule

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Exhibits to Plaintiffs' Motion for Preliminary Injunction

The following exhibits are public records from federal or state agencies or their websites.

Exhibit 1	Upper Willamette River Conservation & Recovery Plan for Chinook Salmon & Steelhead (August 2011)
Exhibit 2	Endangered Species Act Section 7(a)(2) Consultation Biological Opinion ("BiOp") on the Willamette River Basin Flood Control Project (July 11, 2008)
Exhibit 3	2016 5-Year Review: Summary & Evaluation of Upper Willamette River Steelhead & Upper Willamette River Chinook
Exhibit 4	National Marine Fisheries Services ("NMFS") Willamette BiOp Memo
Exhibit 5	NMFS Reply to Army Corps' Draft Federal Willamette River Dam System Strategy Paper (May 27, 2014)
Exhibit 6	NMFS Memo re: Briefing on Willamette Project BiOp and RPA Implementation
Exhibit 7	Oregon Department of Fish and Wildlife Letter to NMFS (May 7, 2015)
Exhibit 8	Memo from Michael Karnosh re: WATER Managers Forum September 29, 2017 Meeting
Exhibit 9	Email from Stephanie Burchfield re: Lookout Point proposed operation modifications (July 25, 2017)
Exhibit 10	Memo from Diana Dishman and Stephanie Burchfield re: WATER RM&E/Steering Team Topics for G4 Meeting on March 8, 2017 (March 6, 2017)
Exhibit 11	Letter from NMFS to U.S. Army Corps of Engineers re: Review of Operation's Information Matrix Spreadsheet for Interim Operations at Willamette Project (May 2, 2011)
Exhibit 12	Army Corps of Engineers Willamette River Basin Operational Measures Evaluation Report (November 27, 2012)
Exhibit 13	Letter from NMFS to Army Corps of Engineers re: Review of Willamette River Basin Operational Measures Evaluation Report, 90% Draft, June 2012 (August 10, 2012)
Exhibit 14	Final Environmental Assessment Downstream Fish Enhancement for Juvenile Salmonids at Fall Creek Dam, Lane County, Oregon (November 2014)

Exhibit 15	Letter from Oregon Department of Fish and Wildlife to Army Corps of Engineers re: 16FAL01 Regulating Outlet Repairs (September 23, 2016)
Exhibit 16	Memo from NMFS to Army Corps of Engineers re: Comments on 2013 Downstream Fish Passage and Water Quality Report (November 21, 2014)
Exhibit 17	Willamette Fish Operations Plan: Willamette Valley Project 2018
Exhibit 18	Willamette BiOp Long Term Alternatives Engineering Documentation Report, Middle Fork Willamette Downstream Fish Passage and Water Quality/Temperature Control 60% Engineering (April 2015)
Exhibit 19	Draft Environmental Assessment: Downstream Fish Passage Enhancement for Juvenile Salmonids at Lookout Point Dam, Lane County, Oregon (June 2017)
Exhibit 20	Proposed Study: Behavior, Distribution, and Passage Metrics of Juvenile Salmonids for Lookout Point Dam (June 14, 2017 version)
Exhibit 21	Willamette Action Team for Ecosystem Restoration (WATER) Research, Monitoring, and Evaluation (RM&E) April 26, 2018 Meeting Minutes
Exhibit 22	Lookout Point Dam Fall Deep Drawdown Operation: Overview & History of 2017 Issue (September 29, 2017)
Exhibit 23	WATER Managers Forum Meeting Minutes (September 29, 2017)
Exhibit 24	Cougar Proposed Special Operation to Improve Downstream Passage & Survival
Exhibit 25	Proposed Study: Willamette Project Dam Passage Delayed Mortality (May 18, 2017)
Exhibit 26	Willamette Basin Annual Operations Report: Research, Monitoring, & Evaluation (2012)
Exhibit 27	Draft Environmental Assessment Downstream Fish Enhancement for Juvenile Salmonids at Hills Creek, Fall Creek, and Cougar Dams 2013-2020
Exhibit 28	Memo from NMFS re: Comments on the Corps' Official Coordination Request for Non-Routine Operations and Maintenance – 16FAL01, Regulating Outlet Repairs (September 23, 2016)
Exhibit 29	Email from Stephanie Burchfield to Diana Dishman (December 8, 2017)
Exhibit 30	Proposed Study: Evaluate reintroduction and productivity of UWR Chinook salmon and/or UWR steelhead above Green Peter Dam (May 18, 2017)

Exhibit 31 WATER Issue Elevation Form: Green Peter reintroduction studies (September 29, 2017)

Exhibit 32 Willamette Valley Projects Configuration/Operation Plan ("COP"): Phase II Report (October 2015)

Exhibit 33 Willamette BiOp Construction Schedules – Compiled 3/6/2017

Exhibit 34 Willamette Basin Annual Water Quality Report for 2016

Exhibit 35 WATER Steering Team – Big Cliff TDG Issue Paper (April 20, 2016)

Exhibit 36 Willamette Basin Annual Water Quality Report for 2017

Exhibit 37 WATER Steering Team: July 14th Meeting Memo re: Big Cliff

Exhibit 38 WATER Managers Update – North Santiam TDG (August 29, 2017)

Exhibit 39 Various documents re: outages and maintenance at Willamette Project dams

Exhibit 40 Email from Stephanie Burchfield to Marc Liverman re: Reservoir Refill Conditions – Willamette Valley Project Drought Impacts (May 6, 2015)

Exhibit 41 Letter from Army Corps of Engineers re: Reinitiation of Consultation on Willamette Valley Project (April 9, 2018)

Exhibit 42 WATER Managers Forum Proposed Agenda (March 2, 2018)

Exhibit 43 *Wishtoyo Foundation v. United Water Conservation Dist.*, No. 2:16-cv-03869-DOC-PLA, Amended Judgment and Permanent Injunction (C.D. Cal. Oct. 4, 2018)

Exhibit 44 Plaintiffs' Proposed Order

Exhibit 45 Initial Appraisal re: Detroit Winter Deep Drawdown

Exhibit 46 ODFW Comments on Behavior and Dam Passage of Juvenile Chinook Salmon at Cougar Reservoir and Dam, Oregon (December 20, 2013)

Exhibit 47 NMFS Comments on Draft Environmental Assessment for Downstream Fish Enhancement for Juvenile Salmonids at Hills Creek, Fall Creek, and Cougar Dams (December 3, 2013)

Exhibit 48 Memo from NMFS to Army Corps of Engineers re: NMFS Comments on the Corps' Official Coordination Request for Non-Routine Operations and Maintenance – 16FAL01, Regulating Outlet Repairs (September 23, 2016)