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THE HONORABLE MICHAEL H. SIMON

IN THE UNITED STATES DISTRICT COURT

FOR THE DISTRICT OF OREGON

PORTLAND DIVISION

NATIONAL WILDLIFE FEDERATION, et al.,

Plaintiffs,

and

STATE OF OREGON,

Intervenor-Plaintiff,

v.

NATIONAL MARINE FISHERIES SERVICE, et al.,

Defendants,

and

NORTHWEST RIVERPARTNERS, et al.,

Intervenor-Defendants.

Case No. 3:01-CV-00640-SI

STATE OF OREGON'S REPLY IN SUPPORT OF MOTION FOR SUMMARY JUDGMENT AND OPPOSITION TO DEFENDANTS' MOTIONS FOR SUMMARY JUDGMENT

Oral Argument June 23, 2015

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INTRODUCTION

There is no question that habitat should be restored, including the critical habitat in the Columbia and Snake Rivers that is adversely affected by hydropower operations. In contrast to habitat projects in the tributaries and estuary, which may take decades before the predicted benefits to fish are realized, operational changes would provide certain and immediate benefits for survival and recovery of the species. Importantly, Defendants (hereafter, the Agencies) have not considered the short-term benefits of the operational changes in the context of their duty to adopt a Reasonable and Prudent Alternative that avoids adverse modification of critical habitat in the maintstem, where the operations are the major human-caused limiting factor on the species' rate of survival from smolt to adult.

In their cross-motion for summary judgment, the Agencies argue that they need not understand the magnitude of the adverse effects of the FCRPS operations and reduce or offset those impacts to comply with Section 7 of the ESA; rather the relevant inquiry is how the agency action affects survival and recovery. *See* Fed. MSJ at 26-27 (ECF No. 2001) (rejecting the requirement to reduce or offset as "Oregon's proposed construct"). Oregon agrees that the ESA prohibits actions that appreciably impact survival or recovery. And, to avoid this result, in the 2008 BiOp, NOAA applies the Section 7 standards using an analysis framework that expressly requires the Agencies to "reduce or offset the adverse effects associated with the proposed action" when the proposed action is likely to jeopardize the species or adversely modify its critical habitat. 2008 BiOp at 1-13 (Step 5 of the analysis, reached only after finding of jeopardy or adverse modification). The Reasonable and Prudent Alternative (RPA) must include sufficient reductions and offsets of the adverse effects of the FCRPS operations to reach a rational conclusion that the continuing operations do not jeopardize the species or adversely modify critical habitat.

The Agencies' continued reliance on the RPA in the 2008 BiOp is arbitrary because: 1) existing evidence shows that the adverse effects of the FCRPS operations on rate of survival

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during smolt to adult life stages are the primary, human-caused limiting factor for survival and recovery; 2) the RPA, including actions in tributary habitat important for some populations, cannot offset the adverse effects of the FCRPS; and 3) the survival improvements and an increasing trend in productivity metrics, which the Agencies predicted in 2008 and relied upon to conclude that the RPA satisfies their ESA duties, have not appeared. The Agencies admit that the status of the populations has not materially changed. Fed. MSJ at 18.

At this point, it would have been rational for the Agencies to assess the continuing actions and the human-caused adverse effects to determine what must change to meet the metrics the Agencies relied upon to avoid jeopardy and adverse modification. As Oregon has explained, and discusses further herein, existing data show that the rate of survival between the smolt to adult life stages (SAR), the stage during which these species must twice travel through the mainstem corridor, is too low to allow wild/natural populations to grow or replace themselves. Instead, the Agencies point to circumstances outside their control, such as ocean conditions and density dependence, which were or should have been anticipated and incorporated into the original assessment of whether the RPA could satisfy the ESA. The only notable change in the 2014 BiOp is to change FCRPS operations that will reduce spill and increase transportation.

This Court ordered that the Agencies "reevaluate[] the efficacy of the RPAs in avoiding jeopardy, identif[y] reasonably specific mitigation plans for the life of the biological opinion, and consider[] whether more aggressive action, such as dam removal and/or additional flow augmentation and reservoir modifications are necessary to avoid jeopardy." *NWF v. NMFS*, 839 F.Supp.2d 1117, 1130 (D. Or. 2011). It is arbitrary and capricious to continue to adopt and implement essentially the same FCRPS operations as the 2008 RPA in the face of information that productivity is not improving, abundances for many populations remain low and the status of the species continues to be at high risk.

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ARGUMENT

I. THE REASONABLE AND PRUDENT ALTERNATIVE MUST AVOID JEOPARDY AND ADVERSE MODIFICATION

A. The Agencies designed the 2008 RPA to reduce or offset the adverse effects of the proposed action of hydropower operations because they determined these operations jeopardize the existence of the species and adversely modify their critical habitat.

The ESA mandates that the federal Agencies, through consultation, shall insure that their agency action is not likely to jeopardize the continued existence of any endangered or threatened species. 16 U.S.C. § 1536(a)(2). If it is NOAA's opinion that the action jeopardizes the species or adversely modifies its critical habitat, then NOAA suggests a reasonable and prudent alternative (RPA) that will avoid jeopardy and adverse modification. 16 U.S.C. § 1536(b)(3)(A). According to NOAA, once it has determined that the proposed action will jeopardize the species or adversely modify its critical habitat, the RPA must:

> both reduce or offset the adverse effects associated with the proposed action to a level that does not likely jeopardize the species, and maintain (or restore) essential habitat features so as to not be likely to result in the adverse modification of designated critical habitat.

2008 BiOp at 1-13 (NOAA B281:NMFS26621) (Step 5 of analysis, only necessary after determination that proposed or continuing action jeopardizes or adversely modifies critical habitat) (emphases added).

In the 2008 BiOp, the subject of the consultation was the RPA because the Agencies had already accepted that the continuing actions of FCRPS operations jeopardize the species and adversely modify critical habitat. NOAA explained that it had already determined that the ten-year operation of the FCRPS was likely to jeopardize eight listed salmon ESUs and adversely modify the associated critical habitat, and it did not revisit that determination. 2008 BiOp at 1-6 to 1-7 (NOAA B281:NMFS26614). Therefore, the focus of the 2008 BiOp was "to develop a program of action for the FCRPS that avoids jeopardy and adverse modification . . . ." *Id.* at 1-7 (NMFS26615). The subject of the consultation included "not only hydropower projects but also

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a variety of non-hydro mitigation actions designed to benefit the listed salmonid species and thereby offset the adverse hydro effects." 2008 BiOp at 1-4 (emphasis added). *See also NWF v. NMFS*, 2005 WL 1278878, *14 (D. Or. 2005) (consulting only on "discretionary" elements of the proposed action had "the effect of substantially lowering the threshold required for the mitigation elements of the proposed action"); *NWF v. NMFS*, 254 F.Supp.2d 1196, 1202 (D. Or. 2003) (when improvements the Agencies were willing to make to FCRPS on-site operations alone would not insure the continued existence of the species, the focus shifted to off-site habitat, hatchery and harvest mitigations to meet the biological requirements for survival and recovery).

Not every proposed action requires an offset or mitigation; only those proposed actions that jeopardize a species or adversely modify its critical habitat. 2008 BiOp at 1-13 (NOAA B281:NMFS26621). As the Agencies recognize, "[t]hat a particular activity may adversely affect a species or 'take' members of the species does not give rise to jeopardy." Fed. MSJ at 9 (citing 16 U.S.C. § 1536(b)(4)). In the BiOp concerning fisheries managed pursuant to the 2008 Agreement in *U.S. v. Oregon*, NOAA concluded that the proposed action was not likely to jeopardize the continued existence of the species or adversely modify their designated critical habitat. *See, e.g.*, 2008 NOAA B377 (ECF No. 1480) at 8-2-32 (conclusion for Snake River Fall Chinook) and at 8.3-47 (conclusion for Snake River Spring/Summer Chinook). Accordingly, no RPA was required. It is the RPA that must reduce or offset the adverse effects of the activity in order to bring such action to a level that will not jeopardize the species or adversely modify critical habitat. Oregon's position that the FCRPS operations (which the Agencies concluded will jeopardize the species) must reduce or offset adverse effects is consistent with its submission of the fisheries Management Agreement (which NOAA concluded will not jeopardize the species) to the Court in *U.S. v. Oregon*, Civ. No. 68-513-KI (D. Or).[1] *See* Fed. MSJ at 27; NWRP MSJ (ECF No. 2009) at 31-36.

[1] Since at least 1993, the Federal Agencies have intimated that if the FCRPS BiOp is found invalid, "things will be tougher on all other activities—i.e., harvest, habitat and hatcheries." *Idaho Dept. of Fish & Game v. NMFS*, 850 F.Supp. 866, 895 (D. Or. 1994).

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B. The nature, extent and magnitude of the adverse effects attributable to the FCRPS are relevant factors to determine whether the RPA avoids jeopardy and adverse modification.

The Agencies argue that Oregon does not identify the legal relevance of estimating the mortality attributable to FCRPS operations, including "latent" or "delayed" mortality, because their "life-cycle analysis accounts for *all* sources of mortality regardless of cause." Fed. MSJ at 28. NOAA's regulatory definitions of adverse modification and jeopardize each require a determination of whether the proposed action will "appreciably" diminish the value of critical habitat or reduce the likelihood of survival or recovery. 50 C.F.R. § 402.02. The greater the nature, extent or magnitude of the adverse effects, the more likely these adverse effects will "appreciably" impact survival or recovery when aggregated with the environmental baseline and cumulative effects.

Moreover, if the Agencies had not skipped ahead to the RPA, NOAA would ordinarily have determined the likely effects of the proposed action of operations of the FCRPS, including "the nature and extent of those effects and their relevance for biological requirements . . . ." 2008 BiOp at 1-12 (NOAA B281:NMFS26620) (Step 3); *see* Fed. MSJ at 9 (mention of the five-step framework to analyze jeopardy as applied to the FCRPS). After aggregating the nature and extent of the adverse effects of the proposed action, NOAA continues to consider "the action's duration and magnitude of adverse effects" to assess the influence the agency's action has on recovery potential. 2008 BiOp at 1-12 to 1-13 (NOAA B281:NMFS26620-21) (Step 4). And, as discussed above, the RPA must reduce or offset the adverse effects of the FCRPS to avoid jeopardy. *Id.* at 1-13 (Step 5). Thus, NOAA's ESA Section 7 analysis requires knowing the "nature and extent" and "duration and magnitude" of the adverse effects, which must be reduced or offset when they jeopardize the species or adversely modify its critical habitat.

The Agencies must consider the adverse effects of the FCRPS in the context of the aggregate effects on the life cycle of the species. However, without also considering the extent or magnitude of all of the effects attributable to the FCRPS operations, the Agencies' focus on "all

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sources of mortality" in the species life cycle masks the adverse effects that the FCRPS is having on the species migratory life stages, critical to survival and recovery. This allows the Agencies to continue their preferred operations in the near-term and claim success by implementing habitat projects, while necessary for many populations, that may not be sufficient to offset the adverse effects of the FCRPS. Moreover, even if the predicted benefits are realized, the species must endure current degraded conditions while they await the benefits to the habitat, which, if they materialize, are not expected until the long-term.

The question is not only the extent or magnitude, but also the nature of those effects and whether they are a factor "limiting improvement in the species' status toward a recovered status . . . ." 2008 BiOp at 1-12 (NOAA B281:NMFS26620). NOAA must "assess whether such limiting factors . . . will be lessened or eliminated" by the RPA to avoid jeopardy. *Id.* The FCRPS is a limiting factor affecting the migratory life stages of the species and the magnitude of those effects matter. Oregon supports the "all-H" approach to respond to limiting factors affecting survival and recovery in all life stages. *See* Fed. MSJ at 5. However, the 2014 BiOp and recent data confirm that the rate of survival during the smolt to adult life stage, during which juveniles must migrate through the hydrosystem to the ocean and back again, is insufficient to maintain or grow the populations from current low levels, regardless of the purported benefits to productivity in the egg to smolt (spawning) life stage from habitat projects. The Agencies overlook this important factor, discussed further below, and the conclusion that the RPA satisfies the Agencies' ESA duties is arbitrary without considering it.

The magnitude, nature and extent of the mortality caused by the FCRPS are relevant factors to evaluate whether the RPA avoids jeopardizing the species and adverse modification of their critical habitat. Courts have not held otherwise. *See* Fed. MSJ at 26-27. In the 1993 FCRPS BiOp, NOAA used a two-step process to analyze jeopardy, asking 1) does the proposed action, hydropower operations for 1993, achieve an interim goal of reducing mortality relative to a base period, and 2) are all proposed actions reasonably likely to reduce salmon mortality over the long

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term such that populations will stabilize. *Idaho Dep't of Fish and Game v. NMFS (IDF&G)*, 850 F.Supp. 886, 891-92 (D. Or. 1994), *vacated as moot*, 56 F.3d 1071 (9th Cir. 1995). This Court held NOAA's jeopardy analysis arbitrary not because the first step had a goal of reducing mortality, but because NOAA selected a base period that had record low numbers of the species for the critical variable in the jeopardy equation.[2] *Id.* at 893. In the second step, NOAA used life cycle models to assess the probability of reaching the stability goal. *Id.* at 896. The model outputs resulted in a wide range of assumptions of the probability of success, and this Court held there was no rational explanation for why NOAA disregarded low range assumptions. *Id.*at 897-98. Finally, this Court rejected defendant-intervenor's argument that NOAA never should have engaged in the second, life-cycle step of the jeopardy analysis because any improved survival satisfies the jeopardy standard as a matter of law. *Id.* at 898-99. This Court noted that the 1993 jeopardy analysis was not in terms of "improved survival" and recognized that "[l]evel of mortality is examined in relation to individual practices while survival focusses upon the hazards posed to an entire life-cycle." *Id.* at 899. It is absolutely necessary for the Agencies to evaluate the life cycle, but in so doing, they cannot bury the fact that the primary source of human-caused mortality are the individual practices that comprise operations of the FCRPS.[3]

The biological opinion at issue in *PCFFA* suffered from an "absence of analysis of the effects of the substantially lower short-term flows" such that the court could not discern the agency's reasoning in concluding that the plan would avoid jeopardy. *Pacific Coast Fed'n of*

[2] At this time, this Court refused to engage in the argument that the jeopardy analysis must focus on mortality attributable to the operations of the dams, as compared to the existence of the dams, a framework that resurfaced in the 2004 BiOp and was later soundly rejected by this Court. *IDFG*, 850 F.Supp. at 893-4; *NWF v. NMFS*, 2005 WL 1278878 (D. Or.) (ECF No. 986), *aff'd* 524 F.3d 917 (9th Cir. 2008).

[3] In the 2000 BiOp, to meet the jeopardy standard, NOAA states that "the mortality of listed salmonids in the different ESUs that can be attributed to the action [operations of the FCRPS] must be below . . . [a] level that, when combined with mortality occurring in other life stages, results in a high likelihood of survival and a moderate to high likelihood of recovery." NOAA B275:NMFS24303.

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Fishermen's Ass'ns (PCFFA) v. U.S. Bureau of Reclamation, 426 F.3d 1082, 1092-93 (9th Cir. 2005) (cited in Fed. MSJ at 26-27). NOAA determined the proposed action, operation of the Klamath Project, would cause jeopardy to coho and adversely modify its critical habitat; therefore, it proposed an RPA for operations which would eventually provide 100% of the flows necessary to avoid jeopardy. *Id.*at 1088. The RPA was divided into three phases: Phase I (2002-05), BOR must provide existing flows with some supplementation from a water bank; Phase II (2006-10), BOR must provide at least 57% of the water needed for the coho because the Klamath Project irrigates 57% of the land in the basin; and Phase III (2010-11), BOR must provide 57% of flows and the other 43% were to be provided by development through an intergovernmental workgroup. *Id.* at 1088-89. The problem was not simply that BOR was only providing a proportional share of water, but rather that the agency did not engage in an analysis of the effects of the lower flows in Phase I and II on the coho to determine whether they would avoid jeopardy. The Ninth Circuit held that the Phase II flow level "appears to be justified solely on the basis of the Klamath Project's share of responsibility for the water use" without undertaking the proper baseline analysis of "what jeopardy might result from the agency's proposed actions in the present and future human and natural contexts." *Id.* at 1093 (emphasis added). Thus, the problem was not using a proportional share as a starting point; the problem was that NOAA failed to analyze whether the lesser, short-term flows would avoid jeopardy. Similarly, here, the Agencies continue to rely on benefits or improvements that may develop later in time.

In the 2004 FCRPS BiOp, the problem was not that the Agencies were attempting to offset the effects of the FCRPS. Fed. MSJ at 27. In fact, the novel analysis in the 2004 BiOp attempted to minimize the adverse effects of the FCRPS, using a hypothetical "reference" operation that excluded impacts from actions they deemed nondiscretionary and that, as a result, "attributed a much smaller portion of the fishes' perilous condition to the proposed operations under review." *NWF v. NMFS*, 524 F.3d 917, 926 (9th Cir. 2008). The Agencies then compared these artificially diminished effects to determine their net effect on the species, rather than in the

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context of the aggregated effects and degraded baseline to determine the proposed actions' impacts on the prospects for the species survival and recovery. *Id.* at 926, 929-30. The ESA requires the Agencies to evaluate the adverse effects of their actions in the context of the aggregate effects on the life cycle of the species. But, in developing alternatives that attempt to avoid jeopardy and adverse modification, the analysis of the RPA must candidly consider the nature and extent of the adverse effects of the FCRPS operations as a primary limiting factor, the life stage that these effects are limiting and the impact on the survival and recovery of the species.

The Agencies strenuously object to any information that indicates that the hydropower operations are the primary, human-caused source of mortality. The Framework Work Group determined the FCRPS is responsible for as much as 74% of human-caused impacts to salmon and steelhead. Oregon MSJ at 7 (citing 2008 AR B0143 (ECF No. 1480) at 28-29 (Table 13)). One declaration backs away from this by describing it as interim, coarse scale guidance with a wide range of uncertainty. Toole Decl. ¶¶ 48-51; *see also* Kostow Decl. ¶ 24. This effort to rationally address the relevant limiting factors remained interim only because the Agencies abandoned it. There is a wide range in the estimates because the proportional impact due to the FCRPS is dependent, in part, on the habitat potential for a particular population. For example, in the aggregate, the estimated range of impacts attributable to FCRPS hydro is 43% to 74%. 2008 AR B0143 at 28 (Table 13). However, for populations that have very low potential for improvement in habitat, the proportional impacts attributable to the FCRPS are higher (55% to 87%) and for populations with high habitat potential, the proportional FCRPS impacts are lower (31% to 58%). *Id.* To the extent there is a wide range of uncertainty, the agencies are comfortable with uncertainty in other areas of their analysis. For example, the Agencies' 24-year extinction risk estimates have "considerable uncertainty," with confidence intervals often

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ranging from 0% to more than 90%. 2014 BiOp at 84-85 (Table 2.1-7) (NOAA A1:NMFS84-85)[4]; Kostow Decl. ¶ 25.

In their brief, the Agencies object that equating incidental "take" limits with FCRPS mortality is misleading because they are predictions that reflect all mortality occurring in the migration corridor, including natural mortality. Fed. MSJ at 7, n.8. Oregon did not equate the incidental take limits to FCRPS mortality. Oregon MSJ at 7-8 (mortality through FCRPS is "reflected" in the amount of take and is "generally consistent with the Framework Group's estimate"). As Oregon pointed out, the incidental take limits do not include any of the delayed or latent mortality that occurs downstream of Bonneville Dam. *Id.* at 8, n.7. Here, the Agencies acknowledge that the FCRPS operations cause delayed mortality. 2008 Supplemental Comprehensive Analysis at 5-7 to 5-8 (NOAA B282:27575-76); Kostow Decl. ¶ 24 (citing NOAA Technical Memo). But, they again object to any attempt to estimate that mortality. Oregon agrees that definitive quantification of delayed mortality is difficult. Whether it can be measured with certainty should not be a distraction to the main point: delayed mortality is a relevant factor that cannot be ignored as contributing to the low survival rate through the FCRPS. Kostow Decl. ¶ 24.

II. CONTINUED RELIANCE ON THE RPA IS ARBITRARY BECAUSE SELECTED LIFE-CYCLE METRICS DO NOT SHOW PREDICTED IMPROVEMENTS

In contrast to the Agencies proclivity to examine mortality at the life-cycle level, which obscures the role of the FCRPS, when it comes to demonstrating that the RPA is avoiding jeopardy and adverse modification, the Agencies downplay the life-cycle metrics they established in the 2008 BiOp in favor of recent information of geometric mean abundance. Even if one accepts the analysis in the 2008 BiOp,[5] the Agencies deviate from it here.

[4] Oregon is not encouraging these wide confidence intervals, which, for the extinction risk and other metrics renders them almost meaningless. Oregon only points out that the Agencies are inconsistent.

[5] As this Court is aware, Oregon has argued in the past that the 2008 BiOp was arbitrary.

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A. The status of the species has not materially changed.

To avoid jeopardy and adverse modification, the Agencies predicted survival improvements that would be necessary to close survival gaps, based on assumptions that there would be expected "base to current" improvements from actions already implemented prior to 2008 and that there would be additional "current to prospective" improvements resulting from the implementation of the RPA. *See* 2008 BiOp at 7-6 to 7-12 (NOAA B281:NMFS26660); *see, e.g.* 2008 BiOp at 8.3-50 (NMFS26832) (Table 8.3.2-4 showing changes in survival gaps necessary for Snake River spring/summer Chinook). For example, the Agencies expected to see proportional changes in survival of 20% from hydro actions completed prior to 2008 for each of the Snake River spring/summer Chinook populations in Table 8.3.3-1. 2008 BiOp at 8.3-52 (NMFS26834).[6] This is described as the base-to-current survival multiplier or "adjustment." *Id.* For prospective actions, those included in the 2008 RPA, the Agencies expected hydro to contribute an additional 5% to the future survival multiplier for these populations. 2008 BiOp at 8.3.54 (NMFS26836) (Table 8.3.5-1). The Agencies have never estimated whether either the base to current or current to prospective multipliers have been realized. 2010 BiOp at Section 2, p. 11 (NOAA B286:NMFS30337) (analysis of survival changes "cannot be done"); Or. Mem. in Support of Supp. MSJ (ECF No. 1802) at 18-23 and Or. Reply (ECF No. 1834) at 8-12.

To evaluate whether the RPA is satisfying the Agencies' ESA duties, for the survival prong of the analysis, the Agencies used the metric of the short-term (24-year) extinction risk. 2008 BiOp at 7-14 (NMFS26668). For the recovery prong (trending toward recovery), the Agencies used three productivity metrics, with the goal that each would exceed 1.0: average returns per spawner (R/S); median population growth (Lambda); and Biological Review Team

[6] In its Motion for Summary Judgment at 7 n.5, Oregon cited to a number of tables in the 2008 BiOp with page references in parentheses. These page references are the "physical" page number if entered into the box in the Adobe Reader menu bar. The citations to the record are: NOAA B281:NMFS26781, 26834, 26836, 26924, 26926-7, 26974-5 and 27028-9.

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(BRT) Trend.[7] 2008 BiOp at 7-20 to 7-27 (NMFS26674-26681). The agencies did not rely upon abundance as a metric to demonstrate survival or recovery. 2014 BiOp at 55 (NOAA A1:NMFS55) ("Unlike other metrics described in this section, the 2008 BiOp did not set an average abundance goal indicative of either the survival or recovery prong of the jeopardy standard . . ."). To determine whether there has been any change in these metrics, the Agencies add new information and "extend" the base period. 2014 BiOp at 48-50; 2010 BiOp at Sec. 2 p.11 (NOAA B286:NMFS30337).

NOAA reports in the 2014 BiOp that there has been "no statistically significant changes in Base Period metrics," for any of these four metrics. 2014 BiOp at 109. The Agencies admit that "the status of the populations had not materially changed from the 2008 BiOp's base period estimates." Fed. MSJ at 18. In the 2008 BiOp, the Agencies relied on a significant portion of the survival improvements (multipliers) in the base to current adjustments, as well as the prospective improvements from the RPA, which would, in turn, result in improving trends in the metrics for productivity (R/S, Lambda and BRT) to put the species on a trend toward recovery. It was on this basis that NOAA concluded the RPA would reduce or offset the adverse effects of the FCRPS operations and would not result in jeopardizing the species or adversely modifying their critical habitat. Adhering to the RPA with this new information is arbitrary, particularly when many populations remain at low populations and high risk of extinction.

B. Many Populations Remain at Low abundance Levels and High Risk of Extinction

"[T]he longer that a species remains at low populations [abundance], the greater the probability of the species' extinction." *See* ESA Section 7 Consultation Handbook at 4-21. Persistent low abundances increase the species susceptibility to chance extinction events, genetic drift or other environmental disturbances. *See id*; Nigro Decl. ¶ 21 (ECF No. 1986). Population size is therefore an important status criterion for salmonid populations. *See* Nigro Decl. ¶ 21;

[7] None of these metrics demonstrate that the RPA is contributing to the species diversity, which is another attribute necessary to the species recovery. 2014 BiOp at 48 (NOAA A1:NMFS48).

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Amended Declaration of Edward Bowles ¶ 15 (ECF No. 1633). Population variability (fluctuations in the species' population) is another important factor that contributes to the risk of extinction. ESA Section 7 Consultation Handbook at 4-21. "As a population fluctuates, one or more factors can lead to a chance extinction, e.g., irreversibly lowering population size to a point where it can no longer recover." *Id.*

The productivity metrics do not show any statistical change and the majority of the ESA-listed salmonids at issue in this action remain at very low population numbers. *See* Fed. MSJ at 18 (citing 2014 BiOp at 45, 73-108); *see also NWF v. NMFS*, 524 F.3d 917, 933 (9th Cir. 2008) (noting the "highly precarious status of the listed" species). Currently, 39 of 47 populations fail to meet the minimum viable abundances threshold established by the Interior Columbia River Technical Recovery Team (ICTRT). Nigro Decl. Table 1, at 16 (citing 2014 BiOp). Six of those populations have fewer than 100 fish per year, and nine populations in the Snake River Spring/Summer Chinook ESU fell to annual abundances of zero to ten adults sometime during the last 20 years. Nigro Decl. Table 1, at 16; *id.* ¶ 21. For several ESUs, naturally spawning populations are dominated by hatchery fish, indicating that returning naturally-produced fish in these ESUs are largely the offspring of hatchery fish and that these ESUs are not self-sustaining without hatchery support. Nigro Decl. ¶ 20(d). In addition, several ESUs have very high abundance volatility, increasing their susceptibility to extinction. *See* Am. Decl. of Edward Bowles ¶ 23 and Table 3 (ECF No. 1633); *see* 2014 BiOp at 110 (illustrates volatility).

Many of these low abundance populations are not growing or maintaining themselves. *See* Or. MSJ at 12-13 (ECF No. 1985). To determine whether a population is maintaining itself, declining or growing, one can compare the number of adult offspring ("recruits") to the number of parents that spawned them ("spawners"). *Id.* at 12; 2008 BiOp at 7-22 (NOAA B281: NMFS26676). When the number of recruits equals the number of spawners (recruits-per-spawner = 1.0), the population replaces itself. When the number of recruits is less than the number of spawners (recruits-per-spawner < 1.0), the population declines. When the number of

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recruits is greater than the number of spawners (recruits-per-spawner > 1.0), the population grows. Or. MSJ at 13; Nigro Decl. ¶ 17. Average productivity (recruits-per-spawner) is less than 1.0 for most of the salmon and steelhead populations in the interior Columbia Basin listed ESUs. Or. MSJ at 13. This means the populations are not, on average, able to replace themselves, much less grow to and stabilize at larger, more viable population sizes. *Id.*

Rather than evaluate whether the RPA is failing to address the relevant limiting factor, the Agencies direct attention to abundance, which does not necessarily demonstrate that the Agencies are avoiding jeopardy or adverse modification. *See IDF&G*, 850 F.Supp. at 899. The Agencies' claims regarding abundance are misleading. As the Agencies acknowledge, "salmonid abundance (the number of adults returning to spawning areas) is highly variable and heavily influenced by ocean conditions" but they claim the FCRPS is now being operated in a way that allows these species to return in "record numbers" when ocean conditions are favorable.[8] Fed. MSJ at 7; *see also* IPNG MSJ at 2-3 (ECF No. 1996). The Agencies fail to include that the 2014 spring/fall returns benefitted from exceptionally high flow and (involuntary) spill that occurred in 2011/2012. And, earlier returns were assisted by court-ordered spill, which the Agencies do not continue in the 2014 BiOp, indeed, the Agencies reduce spill as compared to the 2008 BiOp. Reference to "record" returns also fails to acknowledge that the picture the Agencies paint is one largely filled with hatchery fish. *See* 2008 BiOp at 8.2-3 (NOAA B281: NMFS26747) (conceding that "hatchery returns have increased disproportionately to natural-origin returns").

As the Agencies are well aware, it is the natural runs, not the hatchery fish, that must be the focus of NOAA's inquiry under the ESA. *Trout Unlimited v. Lohn*, 559 F.3d 946, 957 (9th

[8] The Agencies productivity metrics have not shown the predicted upward trend, even with the primarily "good" ocean conditions of the last several years. Current predictions are the ocean conditions have turned for the worse. *See, e.g.*, NOAA's Northwest Fisheries Science Center 2014: Annual summary of ocean ecosystem indicators and pre-season outlook for 2015 ("Many of the ecosystem indicators for 2014 point towards this being a relatively poor year for salmon survival. The summer PDO values were strongly positive (warm), coinciding with a 'warm blob' of water centered in the Gulf of Alaska") available at http://www.nwfsc.noaa.gov/research/divisions/fe/estuarine/oeip/b-latest-updates.cfm (last visited April 6, 2015).

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Cir. 2009). In *Trout Unlimited*, the Ninth Circuit held that "[T]he ESA's primary goal is to preserve the ability of natural populations to survive in the wild....That the purpose of the ESA is to promote populations that are self-sustaining without human interference can be deduced from the statute's emphasis on the protection and preservation of the habitats of endangered and threatened species." *Id.* NOAA's regulations reflect this mandate. 50 C.F.R. § 402.02 (definition of "jeopardize" concerns survival and recovery of listed species "in the wild"). NOAA's hatchery policy prohibits it from viewing large returns substantially comprised of hatchery fish as grounds for optimism under the ESA. Under this policy, hatchery fish are to be included in assessing an ESU's status only in the context of their contributions to conserving natural self-sustaining populations. 69 Fed. Reg.31,354-31,359. The Agencies cannot show predicted survival improvements or increasing metrics. Their focus on abundance, which they did not consider a reliable metric in the 2008 BiOp is simply misdirection.

III. LIFE-STAGE SURVIVAL IS AN IMPORTANT RELEVANT FACTOR TO EVALUATE SURVIVAL AND RECOVERY

Each female salmonid that spawns produces thousands of eggs. *See* 2008 BiOp at 7-22 (NOAA B281:NMFS26676); 50 Fed. Reg. 52630, 52262 (Sep. 2, 2005). For a salmonid population to grow, however, it is necessary to increase the number of eggs that survive all life stages and return to the tributaries as adults to spawn. As noted above, such progeny are called "adult offspring" or "recruits." Production of recruits depends on: (1) the number of eggs that survive to become juveniles ("smolts") per spawner, which occurs in natal freshwater tributaries prior to entry into the FCRPS; and (2) the survival of those smolts to adults (smolt-to-adult return ration, or SAR), which includes survival associated with juveniles and adults migrating through the FCRPS. *See* Or. MSJ at 34; Nigro Decl. ¶ 23. Once the number of smolts produced by a population is known, one can calculate the number of smolts that must return as adults in order to replace or increase the parent population.

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A. Smolts-per-Spawner reflects productivity in tributary habitat

Smolts are juvenile fish that have been reared in the tributary and are ready to begin migration to the ocean. The number of smolts-per-spawner reflects the rate of juvenile survival in the tributary. Using empirical data of observed numbers of smolts-per-spawner, one can use a Ricker Model curve to show production under existing tributary conditions. *See* Kostow Decl. Appendix A, Fig. J. (using the Minam Creek population as an example). The Ricker curve shows Rmax (the maximum number of smolts that can be produced under existing tributary conditions) and Smax (the maximum number of spawners that produce the maximum number of smolts (Rmax) under existing tributary conditions).[9] *See See* Kostow Decl. Appendix A, Figs. J and K.

B. Smolt-to-Adult Returns reflect survival through mainstem and ocean

As salmonids migrate from the tributary habitat to the ocean, they undergo smolting, a major physiological change that enables them to adapt from freshwater to saltwater. Kostow Decl. ¶ 25. Smolting is a hormone-driven developmental process that involves increased salinity tolerance, increased metabolism, downstream migratory and schooling behavior, silvering and darkened fin margins, and olfactory imprinting. *Id.* One reason that juvenile travel time is so important is because the coordination of juvenile migration with the onset of physiological changes and optimal estuary conditions is crucial to salmonid survival. *Id; see also id.* Figs. E & I. SARs are an important measure of whether smolts are surviving to adulthood and successfully returning to the tributary to spawn.

After using the Ricker model to calculate the current production of smolts-per-spawner, one can calculate the SAR survival rate needed in the smolt-to-adult life stage to reach a target population of recruits. *See id.* Appendix A, Fig. L. This simple calculation is as follows: Smolts

[9] The Ricker curve is more conservative than other models because it assumes that smolt production declines at spawner densities above $S_{max.}$ *See* Nigro Decl. ¶ 27. Smax and Rmax represent the carrying capacity of the basin or population. Carrying capacity is the population abundance that environment is capable of supporting given the availability of food, habitat, water, and other necessities. Nigro Reply Decl. Ex. 1 at 2.

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x SAR = Recruits.[10] *See* Nigro Decl. ¶¶ 26-27. As an example, Oregon used this equation to demonstrate the SAR required to reach a target population of 750 recruits (the minimum viable threshold) for the Minam population. In Figure L, the number of smolt-per-spawner, based on empirical data and calculated using the Ricker Curve, is plotted on the black line. Using the number of smolts and the target population of 750, one can solve for the corresponding SAR. For example, when the number of smolts equals 49,615, the corresponding SAR must be 1.5% in order to reach the target population of 750 recruits. *See* Kostow Decl. Appendix A, Fig. L. When the number of smolts is lower—for example, 32,679—the SAR must be higher—2.3 percent—to reach the target population of 750 recruits. The dashed line in Figure L plots the SAR needed to reach the target population of 750 recruits, given the empirical data for this population. *Id.* When productivity in the tributary is at the optimal level under existing conditions (i.e., the number of smolts=Rmax), the lowest rate of smolt-to-adult returns is required to meet a target population of adult recruits. *Id.* When the rate of smolts-per-spawner is lower, the corresponding SAR must be higher in order to reach a target population. *Id.*

The example depicted in Figures L and M is instructive. As described above, Figure L identifies 750 recruits as the population target. This population is able to produce enough smolts (based on Smax); however, these smolts are not surviving in sufficient numbers to return as adults to spawn. Based on the existing production of smolts-per-spawner in the tributary, the dashed line ("SAR replacement line") shows the SAR rate that must be met in order for the population to achieve 750 recruits, or surpassed in order for the population to exceed 750

[10] NOAA argues that the Court should dismiss this analysis because it has not been "peer-reviewed." *See* Fed. MSJ at 29 n. 26. The first part of the SAR argument is based on the Ricker Model, which has been peer-reviewed. *See* Kostow Decl. ¶ 8. The second part of the SAR argument is simply algebra. *Id.*; *see also* ISAB Density Dependence Report, Feb. 25, 2015, attached as Ex. 1 to Kostow Declaration ("The level of smolts per spawner productivity needed to achieve population replacement is readily calculated for any specified rate of smolt-to-adult return (SAR)."). NMFS further argues that the SAR examples in the Nigro Declaration are "not reproducible." Fed. MSJ at 29 n. 26. All of the data used by Oregon is publicly available. Oregon simply applied the Ricker Model and simple algebra to produce its examples, as further explained in the Kostow Declaration. *See* Kostow Decl. ¶ 8.

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recruits. As depicted in Figure M, the SARs for this population are generally below the SAR replacement line; therefore, the population is not achieving the number of recruits necessary for the population to achieve an adult population of 750. *See id.* Appendix A, Fig. M.

C. Failure to consider full scope of adverse effects contributing to the low survival rate at smolt to adult life stage ignores an important aspect of the problem.

As Oregon described in its opening brief, many salmonid populations currently have enough production in the tributary to grow their populations, and even to reach their minimum viable abundance thresholds. *See* Nigro Decl. ¶ 32. These populations remain at low abundances and continue to decline, however, because of low SAR survival rates. SAR survival is also a particularly important factor because, unlike survival changes associated with tributary habitat improvement that "may take years to be fully achieved," survival changes in the smolt-to-adult life stage "may be achieved quickly." 2014 BiOp at 53 (NOAA A1:NMFS53).

The Independent Scientific Advisory Board's recent study on density dependence confirms the relationship between smolts-per-spawner and SARs. *See* Independent Scientific Advisory Board, Density Dependence and its Implications for Fish Management and Restoration Programs in the Columbia River Basin, Feb. 25, 2015 at 128-31 ("hereafter ISAB Report") attached as Exhibit 1 to Kostow Decl.[11] The ISAB Report uses the same equation as Oregon, but instead of solving for SAR, the ISAB uses existing SAR to solve for the smolt-per-spawner rates needed to reach a target population.[12] The ISAB Report analyzes the relationship between abundance and productivity and the issue of density dependence. *Id.* The ISAB notes that:

> Major actions are necessary to increase the productivity of the population (SARs and smolts per spawner) in order to create a self-sustaining population at the current level of spawning salmon.

[11] A different excerpt of this report is attached as Exhibit 1 to the Declaration of Richard Zabel (ECF No. 2004).

[12] Instead of using the Ricker Model to calculate productivity in the tributaries, the ISAB report tended to use the Beverton Holt Model. Figure 9 in the Nigro Declaration compares the two models and demonstrates that they are essentially the same. *See* Nigro Decl. ¶¶ 26-27.

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> Potential actions include habitat restoration to improve survival to the smolt stage *and hydrosystem improvements in the mainstem river as a means to increase SAR* and thereby reduce the smolts per spawner needed to achieve replacement. Petrosky et al. (2001) show that dam construction in the Snake River Basin, rather than changing conditions in spawning and rearing habitats, was responsible for the decline in Chinook salmon productivity, *suggesting that the greatest potential gains in productivity would stem from improvements in the hydrosystem*.

ISAB Report at 131 (emphasis added); *see also* Kostow Decl. ¶ 19 and Ex. 1. The ISAB notes that, for example, if SAR of the Snake River spring/summer Chinook improved from 1.4 % to 2%, then the corresponding number of smolts per spawner needed to reach replacement would decrease from 72 to 50. *Id.* at 130-31.

NOAA agrees that SAR "can illuminate the degree to which changes in R/S correspond to changes in migration corridor and estuary/ocean survival versus changes in tributary spawning and rearing survival." 2014 BiOp at 124. Yet the Agencies urge the Court to dismiss Oregon's argument regarding SAR survival rates on the basis that the "analysis is directed at reaching recovery which …is not the function of ESA Section 7(a)(2)" to justify their failure to consider this issue further. This argument fails. Oregon uses the ICTRT minimum viable abundance threshold as a reference point, just as NOAA used it as a reference in some instances. *See* 2014 BiOp at 55 (Figure 2.1-2 shows the ICTRT recovery abundance threshold of 750 fish as a reference); *see also* Kostow Decl. ¶ 17. Without a reference to recovery, the Agencies again seek to read the "recovery" goal out of the regulatory definitions of jeopardy and adverse modification. *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1069 (9th Cir. 2004). Oregon is not arguing that the RPA must *reach* recovery. Instead, Oregon argues that NOAA failed to *consider* the important factor of the SAR survival rate needed to reach a target population. "[A]s part of the consultation process, NMFS must conduct a full analysis of [recovery] risks and their impacts on the listed species' continued existence." *NWF v. NMFS*, 524 F.3d 917, 933 (9th Cir. 2008). NOAA cannot properly evaluate "recovery impacts without knowing the in-river survival levels necessary to support recovery." *Id.* at 936. NMFS

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must, therefore, "know roughly at what point survival and recovery will be placed at risk before it may conclude that no harm will result from 'significant' impairments to habitat that is already severely degraded." *Id.*[13] As explained above, the majority of the salmonid populations at issue in this case have remained at low populations, some extremely low, which poses a substantial risk to the survival and recovery of the species. Evaluating the rate of survival needed to achieve a target population is an essential part of NMFS' consultation duty.

The Agencies further argue that the RPA does not rely on tributary habitat restoration to achieve survival in the smolt-to-adult life stage because the survival changes NOAA "expects to occur" exceed those expected from tributary habitat for most populations. Fed. MSJ at 29. NOAA's survival expectations, however, have not materialized; NOAA has failed to meet its own metrics, particularly for dam survival where benefits should be realized more quickly.

The states of Montana, Idaho and Washington (the "Three States") argue that NOAA's failure to consider SAR in its jeopardy and adverse modification analyses was reasonable because "most of the mortality in [the smolt to adult] life stage occurs in the estuary and ocean, outside the FCRPS" and "[t]he degree to which mortality in the estuary and ocean is caused by the prior experience of juveniles passing through the FCRPS (i.e., delayed or latent mortality) is unknown and hypotheses regarding the magnitude of this effect vary greatly." Three States' MSJ at 27 (citing 2014 BiOp at 124). Oregon recognizes that substantial mortality in this life stage may be attributable to ocean conditions. However, in addition to the fact that ocean conditions are part of the natural background, significant mortality in this life stage is also attributable to the FCRPS; the action that is the subject of the ESA mandates. *See* Or. MSJ at 5.

[13] NOAA attempts to disavow their obligation to "know[] the in-river survival levels necessary to support recovery," *NWF*, 524 F.3d at 936, by arguing that this holding was limited to NOAA's determination that no harm would result from impairments to the habitat. Fed. MSJ at 53 n. 43. The Ninth Circuit's determination applies equally here. NOAA must know the in-river survival levels necessary to support recovery before it can insure that operation of the FCRPS, with any improvements made by the RPA, does not jeopardize protected species or appreciably diminish the value of critical habitat.

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Evaluating SAR survival rates is an important aspect of NOAA's Section 7 obligation to assess the nature, extent and magnitude of effects attributable to FCRPS operations and evaluate whether the effects are limiting the improvement of the species' status towards recovery. *See* Section I.B. above. The survival rate at this life stage is an important effect attributable, in large part, to FCRPS operations. The influence of ocean conditions on SARs is not a valid basis to ignore them. Moreover, accepting the Three States' argument that mortality is primarily attributed to the ocean, one would expect to see an increase in SARs for recent years given that recent ocean conditions have been good. Instead, SARs remain low. *See* Kostow Decl. ¶ 14. Finally, the Three States argue that NOAA did consider SARs. The isolated references to SARs in the BiOp identified by the Three States do not show that NOAA considered the important factor of SAR survival to evaluate whether the effects of the operation of the FCRPS will appreciably impact survival or recovery to satisfy the ESA Section 7 duties.

The Agencies are overlooking an important aspect of the problem by failing to address SAR survival. The following examples are illustrative.

1. Pristine Tributary Habitat (Marsh Creek and Minam Creek)

The following examples of the Marsh Creek and Minam populations demonstrate that SARs must be increased for low abundance populations to grow. The Marsh Creek and Minam Creek's tributary habitat is located primarily in pristine wilderness. For these populations, under existing tributary conditions, production in the tributary already exceeds the rate that is necessary to achieve the population's minimum viable threshold. *See* Kostow Decl. ¶ 18 and Fig. C; *id* Appendix A, Fig. N; Nigro Decl. Fig. 9. For example, the Marsh Creek tributary habitat already has the capacity to produce 630 spawners, which exceeds the minimum viable abundance of 500 for this population. *Id.*. Similarly, the Minam Creek tributary habitat already has the capacity to produce 860 spawners, which exceeds the minimum viable abundance of 750 for this population. *Id.* Despite the high production in the tributaries, these populations remain low, well below their minimum viable abundances. *Id.* Therefore, the only means to improve the high risk status of

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these populations is to increase the SAR. Consistent with that, the 2008 BiOp does not assume any survival benefits from tributary habitat improvements for Marsh Creek or for Minam Creek. *See* 2008 BiOp at 8.3-52 to 54 (NOAA B281:NMFS26834-36) (Tables 8.8.3-1 and 8.8.5-1).

For Marsh Creek, Oregon chose the population's ICTRT minimum viable abundance of 500 as its target population in this example. *See* Kostow Decl. Appendix A, Fig. N; *see also* Nigro Decl. at 21, Figure 9. Using the Ricker Model, empirical data of smolts-per-spawner is plotted on the black line. The empirical smolt-per-spawner data is represented by black triangles in the figure. Using the equation of Smolts x SAR = Recruits, Oregon solved for the SARs needed to achieve 500 recruits. The corresponding SAR replacement line is plotted on the dashed line. *See* Kostow Decl. Appendix A, Fig. N. Oregon then plotted empirical data of the SARs for this population, which are represented by grey squares in the figure. The empirical data of this population's SARs (grey squares) are below the SAR rate needed to achieve the target of 500 recruits. *See id.*; Nigro Decl. at 21, Fig. 9. Therefore, even though current production of smolts in pristine tributary habitat may be high, the SARs are low; the population levels will remain low and at high risk of extinction unless SARs improve.[14]

This same principle applies equally to the Minam Creek population, which also has pristine tributary conditions. *See* Kostow Declaration Appendix, Figure 4. For the Minam Creek population, Oregon chose the populations minimum viable abundance of 750 adult recruits as the target population. The SARS are well-below the survival rate needed to reach this goal. *See id.*

2. Degraded Tributary Habitat (Pahsimeroi spring Chinook)

For other populations, productivity in the tributary could be improved to help the population reach its minimum viable abundance. *See* Nigro Decl. ¶ 41; Kostow Decl. Fig. C

[14] NOAA criticizes Oregon's use of the Marsh Creek data set to demonstrate the importance of SAR survival. *See* Fed. MSJ at 29, n. 26 (citing Zabel Declaration). Dr. Zabel's concerns are addressed and rebutted in the Declaration of Kathryn Kostow ¶¶ 9-10. Nonetheless, Oregon is using the Minam Creek population as a second example to further demonstrate the concept of SAR survival.

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(showing populations with degraded tributary habitat). For example, the tributary habitat of the Pahsimeroi spring Chinook population is degraded. *See* Kostow Decl. Fig. C. For this population, current tributary habitat has the capacity to produce 720 spawners, below the minimum viable abundance of 1000 spawners. Therefore, improving productivity in the tributary may help increase abundance for this population.

Improving productivity in the tributary, however, is not sufficient to increase population abundance. This is demonstrated by Figure 13 in the Declaration of Tony Nigro. *See* ECF No. 1986 at 30. In Figure 13, the number of smolt-per-spawner, based on empirical data and calculated using the Ricker Curve, is plotted on the solid black line. Oregon then uses the equation (Smolts x SAR = Recruits) to calculate the SAR needed to achieve the minimum viable abundance threshold of 1,000 recruits for this population. *See* Nigro Decl. ¶ 42.; *id.* Figure 13. In order to achieve 1,000 recruits, based on existing productivity, the SAR must equal 14.2 %. Nigro Decl. ¶ 42.; *id.* Figure 13. The corresponding SAR replacement line is shown as a dashed black line. The black squares represent empirical data of observed SARs for this population. The median observed SAR is 0.63%, well below the 14.2 % median SAR requires for this population to reach 1000 recruits.

Figure 13 then incorporates the survival improvements claimed in the 2014 BiOp to see how these improvements effect the SAR required for this population to reach 1000 recruits. The 2014 BiOp claims a 62% survival improvement based on tributary habitat improvement. 2014 BiOp at 273, Table 3.1-1; *id.* at 276. There is no empirical evidence demonstrating this improvement. Nigro Decl. ¶ 43. Assuming for the sake of argument that there has been a 62% improvement in tributary production, Oregon incorporated this improvement into the Ricker Model analysis. Nigro Decl. ¶ 42. This yields a Ricker Curve showing higher productivity in the tributary (i.e., more smolts-per-spawner). This Ricker Curve is shown as a solid grey line in Figure 13. Using this new Ricker Curve, Oregon recalculated the SAR needed to reach a target population of 1000 recruits, using the equation Smolts x SAR = Recruits. This new SAR line is

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shown as a dashed grey line in Figure 13. This calculation shows than even assuming a 62% increase in survival from tributary, the associated SAR must still exceed 5.8% in order to reach a target population of 1000 recruits. The observed SARs, represented by grey squares, remain well-below the SAR replacement line needed to reach 1000 adult recruits. *See* Nigro Decl. at 30, Figure 13; *id.* ¶¶ 42-43.

3. Impact of dams on SARs

Comparing the SAR survival rates of populations that cross different numbers of dams demonstrates that passage through the FCRPS has adverse effects on SARs of ESA-listed salmon and steelhead. *See* OR. MSJ at 36; Kostow Decl. ¶ 20. Oregon is not arguing that this comparison is an effective way to measure latent mortality. *See* Fed. MSJ at 28-29. Instead, Oregon argues that NOAA has failed to consider or explain why recent SARs for interior populations, which must cross more dams, are lower than the SARs for all other populations. *See* Kostow Decl. ¶ 20 and Figure D.

For example, the Snake River Chinook populations that are shown in Appendix A to the Nigro Declaration are above eight dams. *See* Nigro Decl. Appendix A (ECF No. 1986 at 42). The Warm Springs spring Chinook population is above two dams. *Id.* ¶ 30. The Warm Springs and Snake River populations share comparable life histories. *Id.* ¶ 31. Kostow Decl. ¶ 21. For the Warm Springs population, Oregon used the Smolts x SAR = Recruits equation to solve for the SAR needed to reach a target population of 2,000. Nigro Decl. at 24, Fig. 11. As in the figures described above, the solid black line is productivity in the tributary calculated used the Ricker Curve based on empirical data of observed smolts-per-spawner. The empirical smolts-per-spawner data is represented by black triangles. The dashed black line represents the SAR replacement line needed to achieve a population of 2,000. The grey squares represent empirical SAR data. Unlike the Snake River populations that cross 8 dams, for this population, several of the minimum SAR needed to meet the target population is similar to the median observed SAR.

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IV. THE CONCLUSION THAT THE RPA DOES NOT ADVERSELY MODIFY CRITICAL HABITAT IS ARBITRARY

A. "Retain the current ability" to become functional standard fails to comply with the ESA where critical habitat has already been adversely modified.

NOAA's revisionist history of this litigation ignores the critical starting point for the adverse modification analysis. Namely, that NOAA has determined that critical habitat is *already* adversely modified. In the 2000 BiOp, NOAA determined that the proposed ten-year operation for the FCRPS was likely to jeopardize eight listed salmonid species and adversely modify the associated critical habitat. *See* 2008 BiOp at 1-6 to 1-7. The focus of 2008 BiOp was "to develop a program of action for the FCRPS that *avoids* jeopardy and adverse modification of critical habitat." *Id.* at 1-7 (emphasis added). The 2008 BiOp expressly states that "[t]he RPA will have to both reduce or offset the adverse effects associated with the proposed action to a level that does not likely jeopardize the species, and maintain (or restore) essential habitat features so as to not be likely to result in the adverse modification of designated critical habitat." 2008 BiOp at 1-13. To avoid "adverse modification of critical habitat," NOAA must insure that operation of the FCRPS does not "appreciably diminish[] the value of critical habitat for both the survival and recovery of a listed species." 50 C.F.R. § 402.02. NOAA fails to show how its inquiry into whether critical habitat retains its current ability to become functional meets the regulatory standard.[15]

The critical habitat at issue in this action "is already severely degraded." *NWF*, 524 F.3d at 936. The 2014 BiOp, like the 2010 and 2008 BiOps before it, determined that critical habitat is not functional. *See, e.g.*, 2008 BiOp at 8.2-31, 8.3-46, 8.4-24, 8.5-49, 8.6-33, 8.7-43, 8.8-46;

[15] NOAA misleadingly asserts that this standard has been "upheld." *See* Fed. MSJ at 50 (citing *Nw. Envtl. Def. Ctr v. NMFS*, 647 F.Supp.2d 1221, 1234-35 (D. Or. 2005)). While *Nw. Envtl. Def. Ctr* notes this language, plaintiffs in that case did not challenge the "retain the current ability to become functional" standard and the Court did not discuss it. *See Nw. Envtl. Def. Ctr*, 647 F. Supp.2d at 1235 (citing the two bases for plaintiffs' challenge). Here, Oregon is directly challenging this standard and asks the Court to find that it fails to comply with the ESA.

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2014 BiOp at 148, 151, 477.[16] Therefore, "retaining the current ability to become functional" or even improving the ability to become functional, is meaningless when the inquiry is untethered from the question of whether the proposed action will appreciably diminish the value of critical habitat for survival and recovery. *See, e.g.*, 2008 BiOp at 8.2-31, 8.3-45 (NMFS26775, 26827). Contrary to defendants' arguments, allowing degraded critical habitat to "retain the current ability" to become functionally established allows for continued degradation of PCEs where, as here, the current status of the critical habitat is degraded. *See* Fed. MSJ at 54.

The Agencies argue that there is no adverse modification of critical habitat because the functioning of some PCEs is improving. *See* Fed. MSJ at 54. This argument fails to consider these improvements[17] within the context required by the ESA. Namely, whether, even with improvements, operations of the FCRPS will appreciably diminish the value of critical habitat for survival and recovery. NOAA itself has recognized that improvements must be evaluated within the context of the current state of the habitat. In assessing "the species' prospects for recovery in light of the degraded critical habitat" in the 2004 BiOp, NOAA stated that "[t]he purpose of safe passage, relative to 'survival or recovery' of listed species, is survival through the migratory corridor *at a rate sufficient to support increasing populations* up to at least a recovery level." *NWF v. NMFS*, 2005 WL 1278878, at *16 (May 26, 2005) (emphasis added). The Court invalidated the 2004 BiOp because, among other things, NOAA "determined that the species' critical habitat was sufficient for purposes of recovery even though NOAA did not have the information on in-river survival rates to make that determination." *Id.*

Contrary to NOAA's assertion, Oregon is not arguing that "any action must restore PCEs to their fully functioning condition to avoid adverse modification." Fed. MSJ at 54. Instead, , to

[16] NOAA B281:NMFS 26775, 26828, 26870, 26919, 26969, 27052, 27078. Contrary to the Agencies' assertion that the "retain the current ability to become functional" standard is inapplicable in this case, Fed. MSJ at 54, the BiOp expressly relies on the "retain the current ability to become functional" standard to reach the no adverse modification determination. *See also* 2014 BiOp at 477.

[17] As discussed below, Oregon disputes NOAA's determination that PCEs are improving.

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reduce the adverse effects of the FCRPS operations, which are adversely modifying the critical habitat, NOAA must analyze whether the RPA has improved the functioning of the juvenile migration corridor to the extent that the RPA does not appreciably diminish the value of the critical habitat for survival and recovery, as required by the ESA.

B. The Limiting Factor on Critical Habitat is the FCRPS Operations

1. The BiOp's critical habitat analysis masks the impacts of the dams

As Oregon argued in its opening brief, NOAA's no adverse modification determination ignored an important aspect of the problem: the considerable and continuing adverse effects of FCRPS operations on the mainstem critical habitat. *See* Or. MSJ at 28-30. Relying on NOAA's Consultation Handbook, Oregon argues that NOAA must evaluate whether the RPA will insure that the proposed action will not alter the mainstem critical habitat to an extent that appreciably reduces the capability of the habitat to satisfy migratory life-stage requirements that are essential to the species recovery. *See id.* at 28-30. NOAA's analysis fails to do so.

NOAA's response misconstrues Oregon's argument. Oregon is not arguing that NOAA must "determine whether a single PCE is 'adversely modified.'" Fed. MSJ at 54. Instead, Oregon argues that NOAA must ensure that FCRPS operations will not alter the mainstem critical habitat to an extent that appreciably reduces the capability of the habitat to satisfy migratory life-stage requirements that are essential to the species' recovery. The BiOp is devoid of this analysis. Oregon does not dispute that the BiOp sets forth and *describes* the PCEs, the impacts of the dams on the migratory life stages and efforts to reduce such impacts. *See, e.g.*, 2008 BiOp at 1-11, 3-6., 8-3 to 8-15 (NOAA B281:NMFS 26619, 26638, 26709-21); 2008 SCA at 5-6 to 5-8 (NOAA B282:NMFS27547-76). The BiOp similarly describes the "major factors currently limiting the conservation value of critical habitat" including "juvenile mortality at mainstem hydro projects in the lower Snake and Columbia rivers,…physical passage barriers [and] reduced flows." 2008

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BiOp at 8.2-32; *see also id.* at 8.3-45, 8.4-23, 8.5-49, 8.6-32, 8.7-43, 8.8-45.[18] Yet NOAA fails to analyze whether these major limiting factors appreciably reduce the conservation value of the critical habitat for the migratory life-stage. Instead, NOAA generally concludes that "[a]lthough some current and historical effects of the existence and operation of the hydrosystem and tributary and estuarine land use will continue into the future, critical habitat will retain at least its current ability for PCEs to become functionally established and to serve its conservation role for the species in the near- and long-term." 2008 BiOp at 8.2-31, 8.3-46, 8.4-23, 8.5-49, 8.6-33, 8.7-43, 8.8-46.[19]

NOAA argues that it does not need to specifically address the conservation value of critical habitat for the migratory life-stage, and instead can make its adverse modification analysis in the context NOAA's critical habitat analysis as a whole. To support its argument, NOAA relies on *Gifford Pinchot Task Force,* where the Court determined that the agency could evaluate the loss of 20,000 acres of Northern Spotted owl critical habitat within the context of six million acres of federal land. *See* 378 F.3d at 1075. However, the court qualified reliance on critical habitat as a whole, explaining that "[f]ocusing solely on a vast scale can mask multiple site-specific impacts that, when aggregated, do pose a significant risk to a species." *Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d 1059, 1075 (9th Cir. 2004) (citation omitted). Here, the Agencies focus on the critical habitat as a whole masks the specific impacts that the FCRPS operations are imposing on the critical migratory life stages of the species. Moreover, unlike the owl, which had other critical habitat available to it, the fish species here have no choice but to travel through the migratory corridor, which is adversely affected by the operations of the FCRPS.[20] By viewing adverse modification within the context of the critical habitat as a whole, NOAA masks the magnitude of the harm to mainstem critical habitat.

[18] NOAA B281:NMFS26776, 26827, 26869, 26919, 26968, 27025, 27077.

[19] NOAA B281:NMFS 26775, 26828, 26869, 26919, 26969, 27025, 27078.

[20] Except, of course, when the Agencies pull the fish out of these conditions to transport them.

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2. The BiOp fails to consider the value of critical habitat for recovery

A biological opinion that fails to analyze the value of critical habitat for recovery of the species violates the ESA. *See Gifford Pinchot Task Force v. U.S. Fish & Wildlife Serv.*, 378 F.3d at 1069-75 (finding critical habitat analyses in six BiOps fatally flawed for failing to appropriately consider value of critical habitat for species' recovery). "The ESA was enacted not merely to forestall the extinction of species (i.e., promote a species survival), but to allow a species to recover to the point where it may be delisted." *Id.*, at 1070; *see also NWF v. NMFS*, 524 F.3d 917, 932-33 (9th Cir. 2008). NOAA's adverse modification determination must consider the ability of critical habitat to contribute to the conservation and eventual de-listing of the species.

As discussed above, NOAA failed to evaluate the rate of SAR survival needed to achieve a target population. The Agencies' critical habitat analysis similarly overlooks an important aspect of the problem by failing to address SAR survival. The BiOp relies on off-site tributary habitat restoration to mitigate for the direct and indirect impacts of the FCRPS. *See* Or. MSJ at 7 and n. 5. But productivity in the tributaries does not address the problem of low SARs attributable to mortality in the mainstem. Reliance on tributary habitat cannot compensate for the needed survival through the mainstem migratory corridor to allow populations at low abundance to grow and, eventually, recover.

3. The Agencies' claimed "improvements" are overstated and fail to avoid adverse modification of mainstem critical habitat

The Agencies repeatedly assert that there have been "significant survival improvements" for fish in the mainstem corridor and that "functioning of the juvenile migration corridor" is improving.[21] *See, e.g.*, Fed. MSJ at 3, 4, 5, 6, 7, 8, 10, 28, 51. The Agencies further assert, contrary to the BiOp's express reliance on the "retain the current ability to become functional"

[21] As discussed above, this contention alone is not enough.

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standard, that the "safe passage" PCE is functioning. *See* Fed. MSJ at 53 n. 44, 54. These assertions do not stand up to scrutiny.

As Oregon argued in its opening brief, the 2014 BiOp overestimates juvenile dam passage survival. Or. MSJ at 31-32. For example, dam passage performance tests were performed during record high flows in 2011 and 2012 with consequent involuntary spill and, therefore, do not accurately reflect whether the dams are yielding the claimed 96% and 93% passage standards under low flow conditions. *Id.* at 31. Spill, whether due to high flows (involuntary) or as part of operations (voluntary), can increase survival by reducing powerhouse encounters and reducing forebay delays. Comparative Survival Study, 2013 Annual Report (NOAA B408:NMFS40796). The Agencies do not refute that the tests were performed during atypical high flows, but rather claim that the tests are not biased because the average flow that occurs during the evaluation is a matter of chance. *See* Graves Decl. ¶ 42. Low water years, however, are the years of primary concern for fish survival. *See* Kostow Decl. ¶ 36. The tests performed to date did not explore how fish passage was affected under low flow conditions. Instead tests occurred during moderate to high flow years, yet the dam passage "improvements" are assumed to also apply to low flow years. The testing design fails to incorporate regionally defined low–moderate–high flow years. *Id.* The Agencies also do not refute that tests performed under low-flow conditions failed to achieve the performance standards. *See id*.

The Agencies also claim that "survival rates are higher and generally more consistent between years." Fed. MSJ at 4. To support this assertion, the Agencies rely on Figure 4 of the Graves Declaration, which is a reproduction of Figure 3.3-7 in the 2014 BiOp. This figure is somewhat misleading because different seasons are presented across the years. Kostow Decl. ¶ 28. The early years depicted in this figure include late-season survival rates, which are generally lower. The later years depicted in the figure include early-season survival rates, which are generally higher. *Id.* The other sources cited by the Agencies in support of their assertion of improved survival fare no better. *See* Fed. MSJ at 52 (citing the 2014 BiOp at 358-59 and an

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excerpt from the 2013 Comprehensive Analysis, both of which report the results of the limited dam passage performance tests performed during high flow).

The Agencies further claim that juvenile travel time to the ocean has "substantially improved under this RPA." Fed MSJ at 52. It is possible that travel time has been reduced during high flow or as a result of spill; however, there is no evidence to attribute any reduction to the RPA. The Agencies cite to Figure 18 of the 2013 Comprehensive Analysis to support its claim that juvenile travel time is improving. *See* Kostow Decl. ¶ 31. This figure compares flows between 2004 and 2011 without considering that 2011 was an exceptionally high flow year accompanied by high unplanned spill. *Id.* Other sources that NOAA cites to credit structural changes *and* spill to any potential reduction in juvenile travel time. *See e.g.*, Fed. MSJ at 52 (citing NOAA B46:3200; NOAA B263:22216-17); *See* Kostow Decl. ¶ 31 (spill contributes significantly to travel time).

The Agencies argue that the Court should reject Oregon's argument that increased spill could increase SARs on the basis that Oregon uses correlative evidence to support its argument. Fed. MSJ at 29. While correlation does not, by itself, confer causation, all regression analyses involve identifying the relationship between a dependent variable and one or more independent variables. *See* Kostow Decl. ¶ 27. Such regression models are a commonly-used analysis in biology and NOAA itself uses them to support their own conclusions throughout the BiOp. *See id.* The Agencies further argue that transitioning to earlier summer spill does not "reduce" spill. Fed. MSJ at 52. However, summer spill volumes are lower than spring spill volumes. *See* Nigro Decl. ¶¶ 51-53; Kostow Decl. ¶ 27 & Fig. F. Starting summer spill volumes earlier, therefore, is a de facto reduction. NOAA has acknowledged that spill is important for survival and recovery. *See, e.g.* 2008 BiOp at 7-38 (NOAA B281:NMFS 26692) ("juvenile migrant survival is affected by flows and project operations (e.g., spill rates)" and river flows vary due to both natural climate variation and project operations); 2008 SCA at 5-9 (spilling water for fish reduces juvenile mortality and injury rates).

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V. CONTINGENCY PLANNING IS INEFFECTIVE AND ADAPTIVE MANAGEMENT IS EITHER INEFFECTIVE OR THE AGENCIES ARE NOT IMPLEMENTING IT

Whether characterized as the Adaptive Management Implementation Plan (AMIP) contingency measures or the BiOp's adaptive management provisions, the Agencies appear to argue that they are not required to take any action to change the RPA if new information demonstrates that their predictions of survival improvements or increasing metrics are not realized. *See* Fed. MSJ at 30-31. In 2009, in defense of the AMIP, the Agencies promised that they would "update the metrics and the analysis relied upon in the BiOp to provide transparent and public review as to whether the listed species are performing as anticipated" to inform "future adaptive management decisions optimizing fish survival and productivity." ECF Doc. 1733 at 5. As discussed above, the Agencies relied upon substantial survival improvements from Hydro (25% for Snake River spring/summer Chinook), but they have never attempted to determine whether they achieved that amount. The updated life cycle metrics that NOAA selected to demonstrate productivity success (R/S, Lambda and BRT) do not demonstrate an upward trend.[22] The Agencies assert that the ESA does not require contingency planning. However, the ESA does require the Agencies to avoid jeopardizing the species and adversely modifying their critical habitat. The 2014 BiOp, adhering to the RPA in the 2008 BiOp is not satisfying these duties.

VI. BOR AND THE CORPS VIOLATED NEPA BY FAILING TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT ("EIS") FOR THEIR DECISIONS TO ADOPT THE RPA

Oregon adopts and incorporates by reference NWF's argument on reply that the Agencies are required to analyze alternatives, and the environmental impacts of those alternatives, when they adopted the RPA. Preparation of an EIS statement is particularly crucial in this case, where

[22] Even if the productivity metrics were statistically worse than the base period, the Agencies do not dispute that they would not have to take action unless abundance levels precipitously decline.

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federal defendants have consistently failed to consider alternative actions to hydropower operations. The Agencies have failed to comply with their NEPA duties.

CONCLUSION

For these reasons, this Court should grant Oregon's motion for summary judgment in its entirety.

DATED this 6th day of April, 2014.

Respectfully submitted,

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