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UNITED STATES DISTRICT COURT
DISTRICT OF OREGON
PORTLAND DIVISION

NATIONAL WILDLIFE FEDERATION, et al.,

Plaintiffs,

v.

NATIONAL MARINE FISHERIES SERVICE, et al.,

Defendants.

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

2015 REPLY DECLARATION OF CHRISTOPHER TOOLE, Ph.D, NATIONAL MARINE FISHERIES SERVICE, WEST COAST REGION
In support of Federal Defendants' Cross-Motion for Summary Judgment

I, Christopher Toole, declare and state as follows:

1. On March 4, 2015, I provided a declaration ("Toole 2015 Declaration") in support of the National Marine Fisheries Service's (NMFS) Federal Columbia River Power System (FCRPS) Supplemental Biological Opinion ("2014 Supplement") in this litigation. There, I described my qualifications as a fishery biologist and my role in the development of the 2014 Supplement. In that declaration, I discussed issues raised in declarations prepared for the plaintiffs NWF and State of Oregon by Dr. Brendan Connors ("Connors First Declaration"), Mr. Anthony Nigro ("Nigro Declaration"), and Mr. Fredrick Olney ("Olney First Declaration").

2. I have reviewed a second round of declarations filed by Dr. Connors ("Connors Second Declaration") and Mr. Olney ("Olney Second Declaration"). Mr. Nigro did not file a second declaration. I also reviewed a new declaration by Ms. Kathryn Kostow ("Kostow Declaration"), which was filed in support of the State of Oregon's motion for summary judgment and which addresses many of Mr. Nigro's previous points.

I. RESPONSE TO SECOND DECLARATION OF BRENDEN M. CONNORS

A. Dr. Connors confirmed that he does not dispute the methods or results of the 2014 Supplement's Appendix C density-dependence analysis

3. Paragraphs 8-16 of my 2015 Declaration described the purpose of the 2014 Supplement's density-dependence analysis, the Appendix C methods used to quantitatively estimate density-dependence during the original "base" period and the updated "extended base period," the results of the analysis demonstrating no change between the two periods, and the application of the results in the 2014 Supplement to support the conclusion that productivity had not changed between the two periods.

4. In ¶ 17 of my 2015 Declaration, I pointed out that Dr. Connors did not "discuss or dispute the methods applied in the Appendix C analysis, the results of the analysis, or the conclusions of the analysis." Paragraph 3 of Dr. Connors' Second Declaration confirms that this is true: "As a preliminary matter, however, I would like to clarify that the purpose of my prior declaration was not to dispute the conclusions or findings of Appendix C to the 2014 BiOp."

5. In other words, Dr. Connors does not dispute the Appendix C results, particularly the finding that 20 of 26 Snake River spring/summer Chinook populations and 18 of 18 Snake River steelhead populations demonstrated statistically significant density-dependent relationships (2014 BiOp:115; Exhibit 1 of Toole 2015 Declaration [Appendix C], p.9).

6. This result was also cited by the Independent Scientific Advisory Board (ISAB 2015 – Exhibit 1 to Dr. Zabel's 2015 Declaration p. 73 and 78) and contributed to their conclusion that "Substantial recent evidence demonstrates density dependence within many populations of Chinook and steelhead in the interior Columbia Basin (e.g., Zabel et al. 2006, Zabel and Cooney 2013, Walters et al. 2013a, Cooney 2014; Figure I.2)" and "these examples of salmon and steelhead recruitment in the interior Columbia Basin demonstrate that strong compensatory density dependence has been observed in most rivers where data have been examined (26 of 28 Chinook and 20 of 20 steelhead populations), even though natural spawners are much less abundant now than historically."

7. Further, Dr. Connors does not dispute the Appendix C conclusion that there is strong support for the hypothesis that productivity has not decreased for Chinook populations between the Base and more recent time periods and the conclusion that there is no support for the hypothesis that recent conditions are less productive for steelhead than those experienced during the Base Period (2014 BiOp:115; Exhibit 1 of Toole 2015 Declaration [Appendix C], p.9-10).

This evidence was central to NMFS' observation that abundance, extinction risk, and abundance trend had generally improved since the Base Period while some productivity measures such as returns-per-spawner (R/S) had declined, and our explanation that density-dependence associated with high spawner abundance in 2001-2004 could explain this discrepancy (see Toole 2015 Declaration ¶ 9-12). The evidence from the Appendix C analysis, which Dr. Connors does not dispute, supported NMFS' "continued reliance on the 2008 BiOp's description of the rangewide status of these species and the Base Period metrics applied in the 2008 BiOp's quantitative aggregate analysis" (2008 BiOp:129).

8. Nothing in the remainder of Dr. Connors' Second Declaration contradicts these points. Although he mentions density dependence, it is not in the context of the species status review and has no bearing on whether or not the productivity of any species has changed over time. Instead, in ¶ 4 and ¶ 6-20, he responds to Dr. Zabel's technical criticisms of Dr. Connors' hypothesis to explain the mechanism of density dependence under current conditions. Dr. Zabel further addresses technical shortcomings of Dr. Connors' hypothesis in his Reply Declaration. Additionally, in ¶ 5 and ¶ 15-17 of his Second Declaration, Dr. Connor describes management actions that would be necessary "to overcome currently observed density-dependent interactions in tributary habitat" (Connors Second Declaration ¶ 5), primarily citing Mr. Nigro's declaration as evidence supporting his personal opinion. I addressed the lack of relevance of Dr. Connors' assertions to the 2008/2010/2014 BiOps in my 2015 Declaration and further respond to his new comments below.

B. The management action addressed by Dr. Connors does not represent the RPA and the other management actions relied upon in the 2008 BiOp. The management goals that Dr. Connors addresses represent full recovery, rather than goals relevant to the 2008 BiOp's jeopardy analysis.

9. Paragraph 17 of Dr. Connors' First Declaration states that a hypothetical management action consisting of "a focus on restoration of additional tributary habitat" is unlikely to meet a goal of being "sufficient to allow the overall metapopulation to increase its productivity, expand the number of habitat patches occupied and ultimately grow to the point where population viability and conservation status is improved." As I pointed out in ¶ 23 and ¶ 26-32 of my 2015 Declaration, Dr. Connors' hypothetical management action does not correspond to the 2008 BiOp's RPA, which expects greater survival improvements from actions outside of tributary habitat for nearly all populations. Additionally, the goal that Dr. Connors concluded the management action is unlikely to meet, while somewhat vague, appears to correspond more closely to full recovery than to the goals of the jeopardy analysis in this biological opinion.

10. In ¶ 16 of Dr. Connors' Second Declaration, he states that my comment about his management action not representing the RPA "is not particularly relevant to my discussion of density dependence and its relationship to salmon and steelhead population growth in the Interior Columbia basin." I interpret this to mean that Dr. Connors agrees that his hypothetical management action, which he opines is insufficient to meet certain goals, does not represent the RPA. He does not further explain the relevance of his hypothetical management action to the 2008/2010/2014 BiOps. Nor does he dispute that the BiOp management actions described in ¶ 23 and ¶ 26-32 of my 2015 Declaration focus on improvements in life stages represented by the SAR metric, which is what he proposes should be done.

11. Dr. Connors does not specifically address or clarify how the goal described in ¶ 17 of his First Declaration relates to the 2008 BiOp's jeopardy analysis. However, he does re-formulate his original point in terms of a clearer goal of recovery abundance levels in ¶ 16 of his Second Declaration: "...actions beyond tributary habitat improvements that address downstream

bottlenecks to survival would be predicted to be necessary to allow these populations to increase in abundance to levels, such as the ICTRT thresholds for minimum population size..." As discussed in ¶ 28-32 of my 2015 Declaration, the ICTRT abundance thresholds represent recovery delisting criteria and, while the ICTRT products inform our jeopardy analysis, as the 2008 BiOp points out, section 7 does not require NMFS to find that the RPA will achieve full recovery.

C. The jeopardy analysis never required or assumed that abundance would increase to ICTRT recovery abundance threshold levels; average abundance has increased from that described in the 2008 BiOp for most populations; and recent life-stage survival improvements may not yet be reflected in jeopardy indicator metrics for a variety of reasons described in the 2014 BiOp.

12. Paragraph 17 of Dr. Connors' reply declaration states: "To the extent that survival improvements from actions outside tributary habitat in prior years are identified in the 2008 and 2014 BiOps and are predicted to have already occurred, the fact that most interior Columbia Chinook salmon and steelhead populations remain at relatively low average abundances (and well below identified minimums), would suggest the actions have been insufficient to boost survival for these populations sufficiently to allow them to expand their use of tributary habitat patches and alleviate the possible effects of density dependence at relatively low abundance."

13. The first part of this sentence states that survival improvements from actions outside of tributary habitat in prior years, presumably referring to a subset of "Base-to-Current" (2014 BiOp:48-54) survival changes, have not been sufficient to raise population abundances to ICTRT minimum levels. This statement is neither relevant to, nor inconsistent with, the 2008/2010/2014 BiOp jeopardy analyses. NMFS never expected or relied upon reaching ICTRT abundance thresholds as a result of this subset of "Base-to-Current" survival changes or from all expected survival changes, including those associated with the RPA. As described previously, ICTRT abundance thresholds represent recovery delisting goals, achievement of which is beyond the

requirement of avoiding jeopardy in this biological opinion (reviewed in Toole 2015 Declaration ¶ 28-33). While not expected to reach recovery levels due to these actions, average abundance levels have increased since the Base Period for most populations (2014 BiOp:79-83), as have abundance trends (2014 BiOp:104-108).

14. The 2014 BiOp reviewed available evidence and determined that the expected Base-to-Current survival change estimates in the 2008 BiOp remained relevant, except for bird predation and hatchery effects, which were updated (2014 BiOp: 186-187, 190, 194, 202-203, 213, 217-220). The biggest Base-to-Current survival improvements since the start of the Base Period (1980 for most populations) outside of tributaries for most species resulted from changes in hydrosystem survival (e.g., +20% for SR spring/summer Chinook, 2008 BiOp p. 8.3-53) and harvest management (e.g., +4% for SR spring/summer Chinook, 2008 BiOp p. 8.3-53). The life-stage specific survival changes associated with these hydro and harvest management actions can be quantified and are well-documented (2014 BiOp: 186-187, 213).

15. The 2014 BiOp describes a number of reasons why the life-stage specific Base-to-Current survival changes may not be detectable at this time in Extended Base Period indicator metrics, which reflect population changes throughout the entire life cycle (2014 BiOp:68-69). These reasons include natural variability in other survival rates, which may mask or artificially enhance effects of the management actions; the lag in adult returns from a given brood year (the most recently-completed brood years precede 2008); the need for a sufficient number of new estimates to change averages and medians that include 20 or more Base Period observations; and time lags for biological effects associated with some management actions (primarily tributary and estuary habitat actions).

16. In the second part of the cited sentence in ¶ 17, Dr. Connors additionally claims that as a result of "insufficient" actions outside of tributary habitat in prior years, populations have not expanded their use of tributary habitat patches in a manner that alleviates effects of density dependence. He presents no evidence or analysis to support his opinion that populations have not expanded their use of tributary habitat patches in a manner that alleviates effects of density dependence. However, as Dr. Zabel's 2015 Declaration ¶ 9-10 and Dr. Zabel's Reply Declaration ¶ 4-6 point out, Dr. Connors' hypothesis is not consistent with empirical observations, which show that populations in the Columbia Basin quickly increase their spatial extent as abundance increases, rather than passing up usable habitat in high abundance years such that they would be spatially compressed in a small occupied area of habitat.

II. RESPONSE TO DECLARATION OF KATHRYN KOSTOW

A. Oregon's SAR analyses, most of which compare results to goals representative of full recovery, are simply examples of "possible goals" to demonstrate an analytical method. Mr. Nigo's and Ms. Kostow's conclusions about failure of historical and hypothetical management action survival rates to meet these goals should be considered in this context.

17. In ¶ 28-33 and ¶ 35-36 of my first declaration, I questioned the relevance of Oregon's SAR analyses to the 2008/2010/2014 BiOp jeopardy analysis because most of the analyses evaluated survival rates necessary to achieve ICTRT recovery abundance levels. These abundance levels represent recovery delisting criteria, a standard exceeding that necessary to avoid jeopardy in this consultation. My purpose in raising this point was that, without clarification, the results of Oregon's analyses, which for many populations showed insufficient combinations of smolts-per-spawner and SAR survival rates, could be misinterpreted as a shortcoming of the BiOp's RPA.

18. Ms. Kostow (¶ 17) clarified that Mr. Nigro's declaration did not intend to propose an alternative management goal for the 2008 BiOp's jeopardy analysis. The SAR analyses used "several possible goals" as "examples" and "any goal (including replacement) could be used." She states that the point of these possible goals was simply to demonstrate Oregon's analytical method. Mr. Nigro's and Ms. Kostow's conclusions that, for some populations, combinations of smolts-per-adult and SAR survival rates fail to meet these goals should be viewed in this context.

B. The only analysis presented by Mr. Nigro and Ms. Kostow that evaluated a goal approximating one of the 2008 BiOp's jeopardy indicator metrics, neither contradicts nor adds additional insights to NMFS' analysis.

19. Ms. Kostow's ¶ 14 states that I incorrectly equated the smolt-to-adult return (SAR) analysis displayed in Mr. Nigro's Figure 8 with the 2008/2014 BiOp's return-per-spawner (R/S) analysis. What I actually said was that those results, which remain the only part of Oregon's SAR analysis that evaluates a goal resembling a 2008 BiOp jeopardy indicator metric (R/S greater than 1.0), "do not contradict or add additional insights to the Extended Base Period average R/S productivity estimates in the 2014 Supplement" (Toole 2015 Declaration ¶ 22). This is because the results of Mr. Nigro's Figure 8 showed that, on average, recent combinations of smolts-per-spawner and SAR survival, when multiplied together, fail to reach the adult replacement line approximately equal to R/S = 1.0 for 9 of the 10 populations that he displayed - and the 2014 Supplement's Table 2.1-9 (2014 BiOp:90) showed the same thing[1].

20. The SAR analyses presented in Figure 8 and Figure A do not provide further information indicating whether SARs are "too low," or whether smolts-per-spawner are "too low," to achieve

[1] Ms. Kostow's replacement Figure A (Kostow ¶ 12) now shows a second population (Minam) slightly above the replacement curve, which may differ from the 2014 Supplement results because of the difference in the particular years included in each average (Toole 2015 Declaration ¶ 25; Kostow ¶ 14). My point is that, according to Kostow ¶ 14, if a population's smolts-per spawner and SAR are correctly estimated for a given brood year, their product should be equivalent to the empirical adult replacement (i.e., R/S) determined for that brood year.

replacement on average. To reach these conclusions, one would need additional information from another source indicating that, beyond a certain value, further increases in either SARs or smolts-per-spawner are not possible, so any remaining required survival improvements would have to come from other life stages. All that one can determine from Oregon's Figure 8 and Figure A SAR analyses is that the combinations of recent average smolts-per-spawner and SARs for the displayed populations either do, or do not, indicate that the displayed populations have been replacing themselves in recent years. That information is reported more clearly in the 2014 Supplement's Table 2.1-9 (2014 BiOp:90).

21. My previous declaration ¶ 25-27 also pointed out that, while the Figure 8 (and now Figure A) SAR analyses do not provide contradictory or additionally insightful information beyond that presented in the 2014 Supplement's Table 2.1-9 (2014 BiOp:90), they do display the results in a manner that is potentially misleading. Ms. Kostow's declaration does not respond to this point. At least eight additional Snake River spring/summer Chinook populations had Extended Base Period average R/S greater than 1.0. If these populations were displayed on the same figure, their points should fall above the curve representing adult replacement, leaving a different impression of the status of Snake River spring/summer Chinook. Similarly, the individual recent population points displayed in these figures cannot be directly compared with the point representing the historical (1962-1982) Snake River aggregate. That point represents the combination of most or all of this species' 28 populations, rather than just the 10 displayed in Oregon's Figure 8 and Figure A.

C. Ms. Kostow agrees that the 2008 BiOp's jeopardy analysis and the RPA address multiple factors, but she still claims that it is "strongly focused on tributary habitat." The BiOp, in fact, relies on greater survival improvements from other actions than from tributary habitat improvements for nearly all populations.

22. In ¶ 37 of my first declaration, I pointed out that Mr. Nigro's ¶ 44 concluded that "improvements in freshwater production of smolts alone will not allow populations to overcome FCRPS-related mortality" and that "without concurrent improvements in SARs, the benefits of improved tributary habitats cannot adequately compensate for FCRPS impacts." (Emphasis added). I then described in ¶ 38-43 why this hypothetical management action is not representative or relevant to the jeopardy analyses in the 2008 BiOp. The 2008 BiOp conclusions relied on greater survival improvements from other actions, primarily affecting life stages encompassed by the SAR metric, than from tributary habitat actions for nearly all populations.

23. Ms. Kostow's ¶ 16 states that she agrees "that the jeopardy analysis in the 2008 FCRPS BiOp addressed multiple factors, and that actions for 'other Hs' are included in the RPA." She also does not appear to equate the BiOp actions to Mr. Nigro's description of a hypothetical management action that consists of improvements in freshwater production of smolts alone, since she does not mention or further explain the significance (if any) of that management action to the RPA.

24. However, Ms. Kostow also states that "the 2014 supplemental BiOp is strongly focused on tributary habitat." If she is simply referring to the narrative in the 2014 Supplement, then the emphasis on tributary habitat actions is a reflection of the 2011 Court Remand Order, which required more specific identification of habitat mitigation projects for the 2014 through 2018 period (2014 BiOp:33). However, the actions that the 2014 Supplement continues to rely on for most populations are instead focused on survival in other life stages, not in tributary habitat, as described in my first declaration ¶ 37-43.

D. The relative mortality caused by the FCRPS, compared to other sources of human-caused mortality, continues to be highly uncertain.

25. Paragraph 24 of Ms. Kostow's declaration claims that I stated "that the 'FWG Interim Report' (2014 NOAA B143) should be disregarded." I did not say this. In ¶ 48 of my first declaration, I stated that Mr. Nigro presented precise estimates from that document, which "without additional information, implies a level of certainty that is not warranted." In ¶ 49-51, I cited various sections of the report that support my statement.

26. Ms. Kostow does not address the other three reports that Mr. Nigro claimed identified a particular proportion of total human mortality caused by the FCRPS and which I showed either did not actually state this or provided no analysis or explanation to support their statements (¶ 44-47). Instead, she introduces new estimates from NMFS' 1991 proposed listing of Snake River spring/summer Chinook that describing factors for decline (NMFS 1991 – see 2015 Kostow Declaration). That document cites the source of these estimates as a 1986 report from the Northwest Power Planning Council (NWPPC 1986[2]). The methods used by the NWPPC to determine the mortality attributed to "hydropower" are not entirely clear from this report, but some of the key assumptions appear to rely on outdated information that calls the specific estimates into question. For example, NWPPC (1986, p.5) estimated mainstem hydrosystem impacts (including five FERC-licensed hydropower projects on the middle Columbia River that are not part of the FCRPS) to be 15-30% juvenile mortality per dam. This estimate was based on the configuration and operation of dams before most fish protection measures and operations were implemented and is much higher than current in-river juvenile mortality rates (2014 BiOp:358-366). Additionally, the historical estimates of run size that were the starting point for

[2] NWPPC. 1986. Compilation of information on salmon and steelhead losses in the Columbia River Basin. March 1986. Available from: Northwest Power and Conservation Council, 850 SW Broadway, Suite 1100, Portland, OR 97205.

the NWPPC's (1986, p.4) estimates of losses, were described as 10-16 million fish. Pre-development run size is now estimated to be about half that number (5 to 9 million adult fish per year), according to a new re-analysis by the Independent Scientific Advisory Board (ISAB 2015; Exhibit 1 of 2015 Declaration of Richard Zabel).

27. In summary, available evidence continues to indicate that the relative contribution of the FCRPS to total human-caused salmonid mortality is highly uncertain.

E. I accurately described the species-level assessments of current risk in the Five-Year Status Review Summary cited by Mr. Nigro.

28. Paragraph 37 of Ms. Kostow's declaration states that "we cannot reconcile a status of 'high risk' for all populations within an ESU[3] with an overall 'moderate risk' for the ESU," referring to the description in ¶ 58 of my 2015 Declaration, which, according to Ms. Kostow, "apparently" cited NMFS' 5-year status review summaries, which Mr. Nigro cited in his ¶ 22.

29. I did not "apparently" cite the status summaries; I did cite them and provided the exact source information. I also included the reasons that NMFS considered in reaching the "moderate" risk determination for the Snake River spring/summer Chinook ESU, in spite of a rating of high risk for each individual population. These reasons were: "This ESU remains well distributed over 28 extant populations in three states. Total ESU abundance is depressed but not at critically low levels. Some populations have experienced increased abundance in the last five years." (2014 NOAA B290:30647)

30. On a related issue regarding current status of the species, Ms. Kostow does not respond to the points I made in ¶ 52-56 regarding Mr. Nigro's ¶ 15-16 contention that the ICTRT's minimum abundance levels are too low to represent recovery. In my previous declaration I

[3] Evolutionarily Significant Unit, equivalent to a "species" under the ESA. Synonymous with a Distinct Population Segment (DPS) of a taxonomic species.

reviewed the studies described by Mr. Nigro and pointed out that they had either been considered previously by the ICTRT or did not otherwise represent new information relevant to this issue. NMFS continues to regard the ICTRT abundance thresholds as the best available information regarding population abundance necessary for recovery and delisting.

F. It is not necessary to calculate SARs in order to evaluate the 2008 BiOp's jeopardy standard. It is necessary to determine that anticipated survival improvements (in any life stage) are reasonably certain to occur, which the 2014 Supplement demonstrates.

31. Ms. Kostow's and Mr. Nigro's Declarations imply that NMFS should have included a SAR analysis similar to theirs in the 2014 BiOp, and this point is made explicitly by Oregon (Reply Brief p. 15-24) and in Oregon's comments on the Draft 2014 Supplement (recommending that NMFS "add a SAR metric to measure the full effects of the FCRPS;" 2014 BiOp:124; 2014 NOAA B466).

32. As described in the 2014 Supplement, NMFS considers SARs to be a useful indicator of the status of species because it comprises a significant component of the BiOp's R/S productivity indicator metric (2014 BiOp:124). The 2014 Supplement included a review of SARs from the 1960s through 2010, but did not adopt specific SARs as a hydro performance measure because most of the mortality in this life stage occurs in the estuary and ocean, outside of the FCRPS (2014 BiOp:123-127).

33. Ms. Kostow's Declaration ¶ 14 specifies the limited technical circumstance under which calculation of SAR would be necessary: "The Nigro declaration simply demonstrates that, given some known number of smolts, and desiring some number of adults back, a knowable SAR would be required." None of the 2008 BiOp's jeopardy indicator metrics fit this circumstance. All BiOp indicator metrics can be calculated using only spawner numbers and information regarding those spawners, such as hatchery-origin fraction and age structure (2014 BiOp:54-66).

The spawner-based BiOp indicator metrics encompass the entire life cycle, so they incorporate all life stages, including those represented by the SAR metric (see Figure 2 of Toole 2015 Declaration). This approach also avoids the difficulty of comparing SARs calculated by different methods (Zabel 2015 Declaration ¶ 13; Kostow Declaration Figure A showing different SAR methods for Idaho and Oregon populations) and differences in the location of smolt traps relative to spawning and rearing areas of different populations (Zabel Reply Declaration ¶ 10).

34. Spawner data that is used to calculate BiOp jeopardy indicator metrics is available for 28 Chinook and 22 steelhead populations in six listed species, as presented in the 2014 Supplement (2014 BiOp:77-78). Smolt numbers, which are required for Oregon's SAR method, are not available for most of those populations at this time, which is one of the reasons NMFS cited for not using this approach (2014 BiOp:124). For example, Mr. Nigro's and Ms. Kostow's Declarations included only 10 populations of Snake River spring/summer Chinook (Nigro Declaration Appendix A; Kostow Declaration Figures A and C). In contrast, NMFS was able to calculate R/S productivity estimates for 23 populations of this species (2014 BiOp:89-93), at least eight of which have recent combinations of smolts-per-adult and SAR higher than most of the populations presented in Figure A of Ms. Kostow's declaration.

35. The primary reason cited by Oregon and its declarants for needing a SAR analysis is because the maximum productivity of tributary habitat is limited, which limits the degree to which life-cycle survival can be increased as a result of tributary habitat improvements. Their SAR analysis is proposed as a way to determine the additional survival improvements that would be needed from other life stages to meet various goals, including full recovery (see above), once the limits of tributary habitat improvements have been reached.

36. Setting aside technical problems with Oregon's method of defining the limits of tributary habitat improvements (Smax), as described by Dr. Zabel in ¶ 16 of his 2015 Declaration and ¶ 13-16 of his Second Declaration, NMFS is applying more targeted methods than Oregon's SAR analysis to ensure that the tributary habitat actions relied upon do not exceed these limits. NMFS recognizes that survival improvements resulting from tributary habitat actions must be reasonably certain to occur (2014 BiOp:33, citing the 2011 Court Remand Order) and the 2014 Supplement thoroughly reviewed the certainty of expected improvements from tributary habitat actions (2014 BiOp:225-318; Tehan 2015 Declaration ¶ 12-16). An SAR analysis was not necessary to make this determination. Rather, NMFS relied upon technical information specific to the tributaries, populations, and types of actions under consideration and the evaluations of experts familiar with limiting factors and opportunities for improvement in each tributary. NMFS did not rely on survival improvements from tributary habitat actions for populations with limited opportunities for improvement, such as those in the Middle Fork Salmon River, and, for all populations, relied primarily upon survival improvements outside of tributary habitat (Toole 2015 Declaration Table 1).

37. In summary, Oregon's SAR analysis is not required to apply the 2008 BiOp's jeopardy analysis. A SAR analysis is not needed to calculate extinction risk or any of the productivity indicator metrics applied in the 2008 BiOp's jeopardy analysis, because those metrics encompass the full life cycle (including life stages represented by SAR) and can be calculated for a large number of populations using only spawner data. Further, Oregon's SAR analysis is not required to determine the efficacy of tributary habitat actions relied on in the BiOp because information regarding limiting factors and the ability of habitat actions to reduce those factors are applied by experts to particular tributaries and populations that they are familiar with.

III. RESPONSE TO SECOND DECLARATION OF FREDERICK OLNEY

A. Mr. Olney agrees that the new information regarding A-run and B-run Snake River steelhead discussed in his first declaration has no effect on calculation of the Habitat Quality Index that represents the effects of the RPA's tributary habitat actions.

38. In my 2015 Declaration ¶ 63, I noted that Mr. Olney (Olney First Declaration ¶ 64) considered estimation of the effectiveness of tributary habitat actions for Snake River steelhead a source of uncertainty that NMFS should have described in more detail. I responded that I could see no way in which the classification of a population as A-run, B-run, or some new as-yet unnamed category would have any effect on the estimation of habitat quality improvements for any Snake River steelhead population. Those estimates are made by expert panels familiar with the individual populations and the habitat conditions and limiting factors affecting the populations (see Methods for Estimating Habitat Benefits 2014 BiOp:245-264). The habitat quality improvements are dependent upon the expert panels' ability to identify and weight habitat function and determine how a given tributary habitat action will change that function, neither of which is dependent upon the A- or B-run classification of the population or the estimate of that population's productivity.

39. Paragraph 94 of Mr. Olney's second declaration now agrees with this conclusion. "I also agree, as Dr. Toole says in his paragraph 63, that there is no way the classification of a population as A-run, B-run or some new as-yet unnamed category would have any effect on the estimation of HQIs by the expert panels."

40. In addition to the estimates of tributary habitat survival improvements in the 2008 BiOp, all of the Base-to-Current and most of the RPA survival changes anticipated in the 2008 BiOp are also unaffected by the new information, as evidenced by identical estimates for populations identified as "A-run" and "B-run" in Tables 8.5.3-1 and 8.5.5-1 (2008 BiOp p. 8.5-54 through

8.5-58). Exceptions are estimates of benefits from the kelt reconditioning RPA action and survival changes associated with prospective harvest rates.

B. Mr. Olney's concern that higher productivity of A-run steelhead can no longer be reliably used to offset lower productivity of B-run steelhead overlooks that this was only one of several considerations in reaching a determination for Snake River steelhead.

41. Paragraph 96 of Mr. Olney's Second Declaration, which sums up several previous paragraphs, states that, "Verifying that survival benefits to stronger populations have offset problems with poorly performing populations—which they relied on in their 2008 BiOp analysis—to support their conclusions about the performance of the DPS as a whole, will be difficult, or nearly impossible, without the kind of population specific data they currently lack."

42. As described in ¶ 64-68 of my 2015 Declaration, new information regarding the structure and genetics of Snake River steelhead populations adds additional uncertainty about the underlying productivity of any specific population that was formerly classified as "A-run" or "B-run". I discussed two possible ways of addressing this uncertainty but both have shortcomings. It is possible that because of the challenges of run classification, some populations may have productivity that is higher than previously described while others will have productivity that is lower. The overall productivity of all populations for this DPS in aggregate, which was the starting point for the 2008 BiOp analysis, is not affected by the new information.

43. Mr. Olney questions one of the factors that NMFS' considered in reaching recovery prong conclusions for Snake River steelhead at the species level. Specifically, in summarizing the quantitative prospective productivity estimates, the 2008 BiOp noted an expectation of R/S greater than 1.0 for 18-20 of the 24 populations with estimates, and pointed out that those for which R/S was expected to be greater than 1.0 generally had estimates that were considerably greater than 1.0, with a mean of approximately 1.20 (2008 BiOp p. 8.5-45). The 4-6 populations

with estimates less than 1.0 were identified as B-run steelhead, based on information available at the time. They represented ½ to ¾ of the 8 populations analyzed as B-run steelhead in the 2008 BiOp. NMFS noted that, "By providing additional benefits to stronger populations, the Prospective Actions help offset problems with poorly performing populations, supporting the viability of the DPS as a whole." (2008 BiOp p. 8.5-45, emphasis added)

44. NMFS concluded for the recovery prong of the jeopardy standard that, "Taken together, the combination of all the qualitative and quantitative factors discussed above indicates that the DPS as a whole is likely to trend toward recovery when the environmental baseline and cumulative effects are considered along with implementation of the Prospective Actions." (2008 BiOp p. 8.5-46) In reaching this determination, NMFS first considered a range of qualitative factors, including: expected improvement in the status of the species as a whole resulting from the RPA, reduction of limiting factors as a result of the RPA, proactive measures to reduce impacts of climate change on the species, a strong monitoring and reporting program, and contingent actions in the adaptive management framework.

45. NMFS was well aware of the limitations of the Snake River steelhead quantitative analyses informing its conclusions:

> However, quantitative information is extremely limited for the Snake River steelhead DPS because of the difficulty of counting redds or fish during the spring and early summer spawning period. The ICTRT was able to estimate trends for only four populations in the Grande Ronde and Imnaha MPGs and abundance for only two populations. All other population estimates are inferred from average A-run and B-run estimates of base productivity, which are derived from dam counts and assumptions about the distribution of spawners within the DPS. (2008 BiOp, p. 8.5-45)

The 2008 BiOp also lists five additional caveats, ranging from an inability to capture all RPA effects quantitatively to the uncertainty associated with mean results, indicating "that it is important to also consider qualitative factors in reaching conclusions." (2008 BiOp, p. 8.5-46).

46. In summary, while new information regarding the genetics and structure of Snake River steelhead leads to greater uncertainty about the population-specific quantitative estimates included in the 2008 BiOp, NMFS was well aware of the limitations of quantitative analyses for this species and only partially relied on this information in reaching its conclusions. Most of the expected survival changes in the 2008 BiOp are not affected by the new information, including expected changes in tributary habitat survival, as Mr. Olney acknowledges. The 2008 BiOp's anticipated improvements for the species as a whole appear to be consistent with the increasing abundance in recent years (Figure 1).

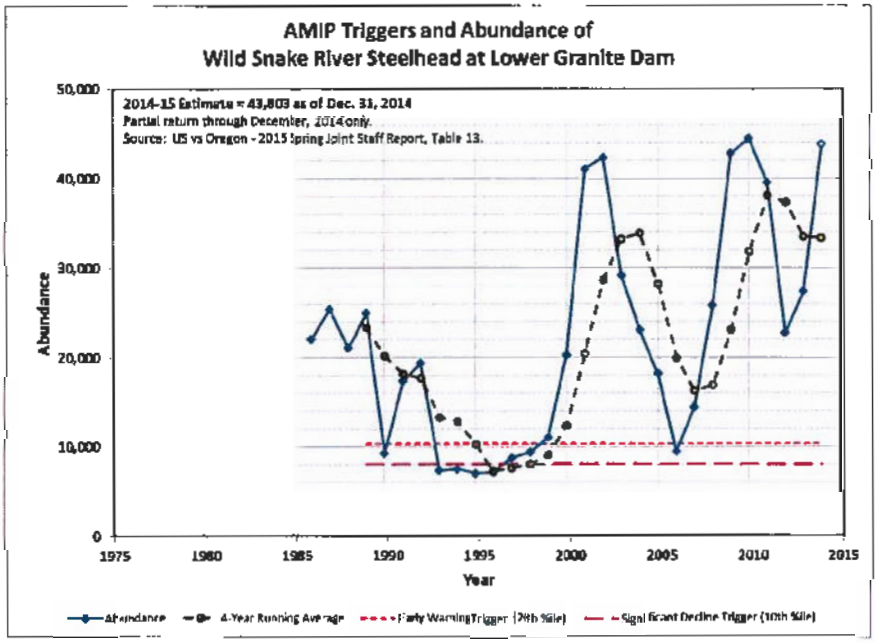

Figure 1. Update to Figure 3.7-3 of the 2014 Supplement (2014 BiOp:422) from R. Graves.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 4, *2015, in Portland, Oregon*

Christopher Toole, Ph.D