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

NATIVE FISH SOCIETY,
MCKENZIE FLYFISHERS,

Plaintiffs,

v.

Case No.: 3:12-cv-431-HA

DECLARATION OF
JAMES A. LICHATOWICH

NATIONAL MARINE FISHERIES
SERVICE, REBECCA BLANK, Acting
Secretary of Commerce, **WILLIAM STELLE,**
Regional Administrator, NMFS, **OREGON**
DEPARTMENT OF FISH & WILDLIFE,
ROY ELICKER, Director, ODFW,
BRUCE McINTOSH, Acting Fish
Division Administrator, ODFW, **CHRIS**
WHEATON, Northwest Region Manager,
ODFW,

DECLARATION OF JAMES A. LICHATOWICH

Defendants.

I, James A. Lichatowich, declare the following matters are personally known to me and to which I am competent to testify under penalty of perjury of the laws of the United States:

1. My current address is 36343 Miloris Way, Columbia City, Oregon 97018. I have been retained by Plaintiffs to provide expert opinion testimony on salmon management and recovery in this matter. This declaration supports the Plaintiffs' Motion for Preliminary Injunction;

PROFESSIONAL QUALIFICATIONS

2. I have 42 years of professional experience with salmon and steelhead research and management. I held positions with the Oregon Department of Fish and Wildlife during the first half of my career, and I worked as a fishery consultant during the second half;

3. I received Bachelor of Science (B.S.) and Master of Science (M.S.) degrees in Fishery Science from Oregon State University in 1969 and 1970, respectively;

4. I worked for the Oregon Department of Fish and Wildlife ("ODFW") from 1973 to 1988. I held the position of Supervisor of the Fisheries Research Section from 1979 to 1983. I was the Assistant Chief of Fisheries from 1983 to 1988, where I was responsible for all fisheries management programs in the State's fresh water areas and for the development of statewide species management plans and river basin management plans.

5. Since leaving the Oregon Department of Fish and Wildlife, I served on ten independent science panels investigating several aspects of salmon management and recovery programs. The geographical area covered by these panels ranged from the Skeena River in

British Columbia to the Sacramento River in California. Three of the panels were standing bodies;

6. I served for ten years, from 1991 to 2001, on the Independent Science Advisory Board (“ISAB”) of the Northwest Power Planning Council, during which I was the Chairman from 1999 to 2001. The ISAB was established by NOAA Fisheries Service (“NMFS”) and the Northwest Power and Conservation Council to provide independent scientific advice and recommendations on various aspects of the restoration of Columbia River salmonids;

7. I served from 1997 to 1999 on the Independent Scientific Review Group (“ISRP”). The ISRP is a panel of eleven scientists mandated by Congress and established by the Northwest Power Planning Council to provide scientific peer review for projects proposed to be funded through the Bonneville Power Administration’s annual fish and wildlife budget;

8. From 1997 to 2002 I served on Oregon’s Independent Multidisciplinary Scientific Team (“IMST”), which was established by the Oregon Legislature to provide independent scientific evaluation of the Oregon Plan for Salmon and Watersheds and its implementation. While serving on the IMST, I participated in a review of Oregon’s hatchery programs;

9. I served as a special consultant to the Hatchery Scientific Review Group (“HSRG”) for its evaluation of the Elwha River Fish Restoration Plan and associated Hatchery and Genetic Management Plans (“HGMPs”), which was conducted in late-2011 and early 2012. The HSRG is a congressionally chartered independent scientific panel charged with evaluating hatchery programs and their impacts on wild salmonids;

10. I have received numerous awards and recognitions for my work in fishery science, including the 2002 Distinguished Graduate Award from Oregon State University’s Department of Fisheries and Wildlife. I received Awards of Merit from the American Fisheries

Society in 1977, 1992 and 2000, and in 2005, I was named Fishery Worker of the Year by the Oregon Chapter of the American Fisheries Society;

11. I authored or co-authored numerous book chapters, papers and reports on the management and recovery of salmonids. I am the author of the book *Salmon without Rivers: A History of the Pacific Salmon Crisis*, which won the Washington Governor's Writers Award, has been translated into Russian, and is marketed as a university level text book. In writing this and other documents, I have studied extensively the history of the decline of Pacific salmonid populations, including the causes thereof;

12. Attached hereto as Exhibit 1 are my curriculum vitae, which includes a list of all my peer reviewed publications;

13. Although I have not provided expert testimony at trial or deposition during the last four years, I recently prepared and submitted a declaration on behalf of the plaintiffs who are challenging the management of hatchery programs associated with the Elwha River in *Native Fish Conservancy v. National Park Service*, No. 3:12-CV-05109-BHS (W. Dist. Wash.);

14. My normal hourly rate is \$150/ hour and I worked 18 hours preparing this declaration;

Historical Context

15. Many of the problems arising from hatchery programs have roots that extend back to the 19th century and the false assumptions that justified their first use. Spencer Baird, the first U. S. Fish Commissioner, introduced hatcheries to the Pacific Northwest in 1872. Baird said that the use of hatcheries would make salmon so abundant that there would be no need to regulate harvest or protect habitat. He drew that conclusion before there was even the most basic

understanding of the salmon's biology and ecology or any evidence that hatcheries could replace natural salmon-sustaining ecosystems. It was a myth so imbued with hope that salmon managers avoided any critical evaluation of it. Today, with salmon extinct in forty percent of their natural range and many of the remaining populations protected by the federal Endangered Species Act, it is clear that hatcheries failed to meet the expectations that justified their initial acceptance. In the late 1960s, fishery scientists began looking into the possibility that hatcheries not only failed to achieve their goals, but that they were contributing to the decline in the productivity of natural, salmon-sustaining ecosystems. The evidence has been accumulating and today the weight of that evidence is clear: hatcheries are part of the salmon's problem. The myth that hatcheries are the solution to the problem of the salmon's declining abundance and the inclination to ignore contrary scientific information is still strong. It is a formidable impediment to the incorporation of our current scientific understandings of the effects of hatcheries into salmon management and recovery programs (for a discussion of the failures to incorporate science see J. Lichatowich and R. Williams. 2009. Failures to incorporate science into fishery management and recovery programs: Lessons from the Columbia River. Pages 1005 – 1019, in Krueger, C. and C. Zimmerman eds. Pacific salmon: Ecology and management of western Alaska's populations. American Fisheries Society Symposium 70. Bethesda, MD). The Sandy River spring Chinook Hatchery and Genetic Management Plan is a clear example of the failure to recognize and use information provided by fishery science.

Opinions on the Spring Chinook Hatchery Program

16. According to NMFS, "The primary goal of an HGMP is to devise biologically-based artificial propagation management strategies that ensure the conservation and recovery of ESA-listed salmon and steelhead populations" (<http://www.nwr.noaa.gov/salmon-harvest->

[hatcheries/hatcheries/HGMPs.cfm](#)). The Hatchery and Genetic Management Plan for spring Chinook in the Sandy River has several shortcomings that lead me to conclude that it will fail to achieve that goal and it should not have been approved by NMFS. The shortcomings in the HGMP I identify in this declaration are described under under the headings: Acclimatization, Key Assumptions and Failure to Identify Tradeoffs.

Acclimatization

17. According to the HGMP, brood fish for the spring Chinook program will be collected at the Sandy Hatchery (500 ft. elevation) or at temporary weir and trap locations in the upper basin. The Adult fish will then be transported to Clackamas Hatchery (313 ft. elevation) where they will be spawned. The eggs will remain at Clackamas hatchery until they reach the eyed-egg stage when they are taken to Willamette Hatchery (1,217 ft. elevation) to be hatched and the juveniles reared until they reach the size of 200 fish/pound. At that point they are taken to Marion Forks Hatchery (2,580 ft. elevation) where the juveniles are reared until they reach the size of 20 fish/pound at which time they are sent back to Clackamas Hatchery where they are reared to the smolt stage (13 fish/pound). I included the elevation of each hatchery to indicate the potential variation in environmental conditions the juveniles are exposed to. The smolts are then taken back to Sandy Hatchery or off-station acclimation ponds where they are held for “final Acclimation” before being released into the river. This schedule is more like an industrial manufacturing process than a “biologically-based” propagation strategy for an animal that has as one of its evolutionary legacies a strong affinity to the environmental conditions in its specific home stream. The HGMP mentions the convoluted and out-of-basin rearing of spring Chinook (pages 18-21), but dismisses in-basin rearing because Sandy Hatchery has inadequate facilities. Then the consequences of the out-of-basin rearing are dismissed by simply stating that those

consequences will be minimized without either defining what minimize means (see failure to identify tradeoffs section, below) or how monitoring will determine if minimization actually occurs.

18. The program relies on the assumption that the evolutionary legacy of Sandy River spring Chinook can be overridden without consequences and that they are so malleable they can be re-acclimated to their home river in spite of the convoluted rearing process. The idea that the tolerance of animal species to environmental conditions is malleable has a long history in fish and wildlife management. In the 19th century it was believed that animals could be acclimated to any environment. Acclimation Societies were formed around the world for the purpose of moving animals to foreign countries and habitats, an effort that was often aided by fish and wildlife management agencies. Through these acclimation programs striped bass, shad and carp were introduced into the Pacific Northwest in exchange for salmon eggs that were planted in streams in states like Maryland and Virginia. Over time biologists learned that animals have a definite range of environmental conditions they can tolerate and it was useless to try to acclimatize them to conditions outside their tolerable range. Acclimatization and the societies that implemented it on a global scale were abandoned. However, the concept didn't die. It reemerged as a tool of fish and wildlife management agencies and is applied at smaller geographical scales. The Sandy River spring Chinook hatchery program is an example. Salmon can survive when moved between environments at smaller geographical scales, but an acceptable survival rate is not the only metric that should be used to evaluate a program that relies on the concept of acclimatization.

19. Science is telling us that environmental conditions at fine geographical scales are important to critical attributes of the salmon such as life history and life history diversity (for a

broad survey of this subject in the Columbia Basin see the monograph by E. Brannon, M, Powell, T Quinn and A. Talbot. 2002. Population structure of Columbia River Basin Chinook salmon and steelhead trout. Center for Salmonid and Freshwater Species at Risk, University of Idaho, Moscow, Idaho). The HGMP for Sandy River spring Chinook ignores this science and its potential consequences. In my opinion the convoluted rearing process described in the Sandy River Spring Chinook HGMP is not consistent with the stated goals of HGMPs “to devise biologically-based artificial propagation management strategies...”. In fact it describes a program that ignores the salmon’s biology. The program as described is not consistent with a biologically-based approach, but is consistent with an industrial production process. What is more troubling is that the HGMP does not acknowledge that the rearing program is not consistent with our understating of the salmon biology. The possibility of straying due to the convoluted rearing program is mentioned on page 21, Issue 1: Alternative 2. The HGMP states: “Straying of hatchery fish to the Willamette Basin (where the fish are reared) has not been a problem in the past, even when the broodstock were of Clackamas River origin.” Statements such as this immediately raise two critical questions. Were straying fish actively looked for and was the effort and sampling design adequate to detect straying in such a large basin as the Willamette?

20. In my opinion, the convoluted rearing process increases the likelihood that the hatchery program will result in take of the listed species.

Key Assumptions

21. The HGMP for Sandy River spring Chinook contains several assumptions in key areas of concern. They are listed here along with the page number where they can be found:

1. However, it is believed that any incidental impact due to competition for food and space between listed species and hatchery fish will be minimal, based upon risk aversion measures of the hatchery program identified in this HGMP (page 26).
2. These basin-specific environmental cues, along with pre-migration imprinting are believed to encourage adult homing to release areas (page 75).
3. Walleye (*Sander vitreus*) and smallmouth bass (*Micropterus dolomieu*) have been estimated to consume substantial numbers of emigrating juvenile salmonids in some areas. However, in general their predation on salmonids in the lower Columbia River and the estuary is considered relatively low (page 43).
4. Spring Chinook smolts are released at a size that supports swift emigration and little residualization. This should minimize spatial and temporal overlap, thereby reducing competition with wild juveniles for food and cover (page 45).
5. The number of hatchery spring Chinook released from this program is considered “moderate in magnitude relative to other Columbia River production programs and is not expected to cause serious density dependent effects in the Sandy Basin or lower Columbia River reaches” (NMFS 1999) (page 45).
6. It is expected that smolts acclimated in the Bull Run River will effectively home to, and enter, this system when they return as adults due to the unique water source and greater summer/early fall flows (page 44).
7. Hatchery brood originate from local Sandy Spring Chinook and are currently taken across the adult return period to the extent possible in proportion to returns in order to limit selection for specific run timing. These measures should help limit the impacts of any hatchery fish which do happen to spawn in the wild (page 44)
8. The program fish (smolts) shall be released from Cedar Creek (a tributary to Sandy River) and from an off-station acclimation site in the lower Bull Run River. It is assumed that adult escapement into natural production areas in the upper Sandy and Salmon rivers shall be composed of at least 90% wild Chinook on the natural spawning grounds and presumably no more than 10% hatchery-origin adults (page 10).
9. It is assumed that stray rates will be reduced substantially when fish that were fully acclimated and released from Sandy Hatchery and the new acclimation pond in a lower river tributary (i.e. the Bull Run River) begin to return (page 21).

22. There are commonalities among these nine assumptions. The consequences, should the assumptions be wrong, occur outside the hatchery and to the detriment of naturally-produced salmon. In its review of the state’s hatchery program, Oregon’s Independent multi-disciplinary Science Team (“IMST”) recommended that more attention be paid to the fate and effects of artificially propagated fish after release from the hatchery (IMST 2001). Having served on the IMST when it conducted the review of Oregon’s hatchery program, it is my

opinion that the IMST did not want this recommendation dismissed by a series of unsupported assumptions.

23. The normal practice of giving evidence from the scientific literature that supports each assumption was not followed in the Sandy River spring Chinook HGMP. The assumptions are not clearly linked to a well-designed monitoring and evaluation projects that could validate the assumptions. The monitoring and evaluation program is so vague and lacking in usable information that it is impossible to determine if it will be possible to determine the validity of any of the nine assumptions. This is disturbing because, in aggregate, the assumptions will largely determine if the program will meet the stated purpose of HGMPs of ensuring the recovery of ESA-listed salmon and steelhead populations. Some individual assumptions need additional comment.

24. Assumption five is particularly troubling. The quote given in this assumption is not in the reference cited as the source. The quote implies that it is specific to spring Chinook. However I found the same exact quote in the HGMPs for coho salmon, summer steelhead and winter steelhead. They all cited the same NMFS 1999 document, except the HGMP for winter steelhead which attributes the quote to a U.S. Fish and Wildlife Service document that is not included in the reference list. This is sloppy editing at best or obfuscation and it calls into question the validity the assumption.

25. More important is the assumption itself. The concern addressed by this assumption is whether the number of hatchery fish released into the Sandy River is too large for the basin's capacity. That concern cannot be addressed by simply saying the size of the hatchery program in the Sandy River is comparable to production programs in other unspecified basins unless it is first determined that the natural production capacities of those basins and the Sandy

are the same. Whether or not the Sandy River spring Chinook program is compatible with the basin's productive capacity must be determined by comparing the size of the hatchery program with information on the capacity of the Sandy River. The Northwest Power Planning Council ("NPPC") emphasized this point in its congressionally mandated review of the Columbia Basin's hatchery program (NPPC 1999). The relevant recommendation is number 8, which states in part: "Care should be taken to limit release numbers consistent with the estimated rearing capacity of the system to minimize impacts on wild fish."

26. I mentioned that I could not find the specific quote given in assumption five in the document cited as the source of the quote. I did find in that same document this statement, "Density dependent effects resulting from competition between two different species can still be severe at densities well below the carrying capacity of the habitat." This statement would seem to negate the one cited in the HGMP. The validity of assumption five is critical to the well being of the listed populations in the Sandy River. The way that it is used calls into question its validity and it is not addressed in the monitoring and evaluation program.

27. Assumption seven suggests an ignorance of scientific findings published in peer reviewed journals, especially the research on the hatchery program a little further up the Columbia in Hood River. Information in the scientific papers from the Hood River call into question the validity of assumptions seven. The failure to acknowledge important and relevant scientific findings is consistent with my earlier statement regarding the failure to incorporate science into salmon management and recovery programs in the Columbia River.

28. Monitoring and evaluation to test the validity of assumption 8 is addressed in the HGMP in section 1.10, performance standard five. However it is not enough to simply state that spawning ground surveys will be conducted by research staff. Assumption 8 specifies that no

more than 10% of the fish spawning in the natural spawning areas can be of hatchery origin. The HGMP needs to include specific recognition that the design of the spawning surveys must be able to detect the presence of hatchery fish at the 10% level with a reasonable level of certainty. Otherwise a program may be falsely considered a success because the sampling design was not capable of detecting a problem.

29. In my opinion, there is a strong likelihood that many if not all the assumptions, with the exception of assumption 3, will prove to be false resulting in harm to the wild spring Chinook. Even more troubling is the lack of specific plans to validate the assumptions through monitoring and evaluation. Without an adequate monitoring and evaluation program, problems related to a false assumption will go undetected until they are expressed as declining numbers of wild fish. At that point, the cause of declining numbers of wild fish and the appropriate restoration strategy will be difficult to determine.

Failure to Identify the Tradeoffs

30. The Hatchery Scientific Review Group (“HSRG”) is a panel of thirteen salmon managers and scientists who have reviewed and evaluated hatchery programs in Washington state and Columbia River over the past several years. Among the many documents, recommendations and conclusions produced by the HSRG, one sentence stands out as being among the most important statements on hatcheries that I have seen in recent decades. Here is that sentence: “Hatcheries are by their very nature a compromise—a balancing of benefits risks to the target population, other populations, and the natural and human environment they affect.” (HSRG. 2011. Hatcheries, conservation and sustainable fisheries—Achieving multiple goals: Results of the Hatchery Scientific Review Group’s Columbia Basin review. Fisheries: Vol. 36, pages 547-561). That unequivocal statement means that those attempting to justify a hatchery

program by preparing an HGMP must divulge what tradeoffs they are willing to accept, what cost to wild and listed salmon and steelhead populations they are willing to accept. The HGMP for the Sandy River spring Chinook hatchery program avoids a direct statement of the tradeoffs by vague promises to minimize the impact of the hatchery program on wild populations. I have listed below only six of the many promises to minimize contained in the HGMP:

1. Objective 4: **Minimize** adverse ecological impacts to watersheds caused by hatchery facilities and operations.
2. The following is a summary of key hatchery practices and management features in place to **minimize** the risk of potential impacts to listed salmonids.
3. Performance Standard (13): Minimize impacts to naturally produced juvenile spring Chinook.
Indicator (13)(a): Hatchery fish will be released in time and space, and in a condition that **minimizes** the interaction with listed fish.
Monitoring and Evaluation: Monitor smolt development using available indicators, e.g. age, size and coloration of smolts at the hatchery to assure smolts are full-term at release. Utilize distinct release locations at or downstream of Sandy Hatchery.
4. An off-station acclimation site is being developed in the lower river (lower Bull Run) to **minimize** straying into the wild fish management area in the upper Sandy basin.
5. Spawning interactions between returning hatchery fish and the naturally produced population are **minimized** by acclimating 100% of the annual release at Sandy Hatchery on Cedar Creek for a minimum 2-3 week period and managing the basin above this site as a wild fish sanctuary.
6. Interactions between hatchery Chinook smolts and wild juveniles are minimized by release strategies which promote rapid emigration.

31. The word minimize is a relative term. Something will be minimized relative to a standard. In the context of the HGMPs, which are prepared to ensure hatcheries are managed to ensure the conservation and recovery of ESA-listed salmon and steelhead populations, use of the word minimize can be interpreted in two ways: The impact of some aspect of the hatchery operation on wild salmon and steelhead will be reduced to zero or so close to zero the difference is negligible, or it will be reduced not to zero, but relative to the level of tradeoffs (cost to wild salmon) that is deemed acceptable. In either case it is imperative that the HGMP clearly state which interpretation of minimize is being used. If it is the latter, then the acceptable level of the

tradeoff must be stipulated. For either interpretation, the the monitoring and evaluation program must show that it is capable of detecting the potential impact consistent with the acceptable, and stipulated, tradeoff. Using the term minimize without clarifying what it means and how it will be monitored is essentially making a nice sounding statement that is devoid of real and useful information. The Sandy River spring Chinook HGMP makes extensive use of the promise to minimize.

32. In the first example listed above, the objective to minimize ecological impacts to watersheds withholds the critical information that would allow the reader to really understand what the objective is. The same could be said regarding many of the thirty five uses of the word minimize in the HGMP.

33. Because key concerns are dismissed with the promise to minimize with out defining what that means and because there is no clear linkage to adequate monitoring and evaluation, it is quite possible that the concerns dismissed by minimize will emerge as harmful impacts on wild spring Chinook in the Sandy River. As stated above, the cause of the resulting problem will be difficult to determine.

Summary

34. The HGMP for Sandy River spring Chinook can be characterized as having an inflated volume while at the same time a deflated information content. In my professional opinion it is not consistent with the stated goal of HGMPs “to devise biologically-based artificial propagation management strategies that ensure the conservation and recovery of ESA-listed salmon and steelhead populations,” and if it is implemented with all its shortcomings will result in take of listed spring Chinook in the Sandy Basin. It should not have been approved by NMFS.

The spring Chinook hatchery program must be suspended until it can be implemented under the guidance of a competent HGMP.

References Cited

- Brannon, E., M. Powell, T. Quinn and A. Talbot. 2002. Population structure of Columbia River Basin Chinook salmon and steelhead trout. Center for Salmonid and Freshwater Species at Risk, University of Idaho, Moscow, ID.
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- IMST. 2001. The scientific basis for artificial propagation in the recovery of wild anadromous salmonids in Oregon. Technical Report 2001-1. Corvallis, OR.
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- NMFS. 1999. Biological opinion on artificial propagation in the Columbia Basin: Incidental take of listed salmon and steelhead from federal and non-federal hatchery programs that collect, rear and release unlisted fish species. National Marine Fisheries Service, Northwest Region.
- NPPC. 1999. Artificial production review. Council document 99-15. Portland, OR.
- <http://www.nwr.noaa.gov/salmon-harvest-hatcheries/hatcheries/HGMPs.cfm>

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury that the foregoing is true and correct.

DATED this 14th day of February 2013.

s/ James A. Lichatowich

James A. Lichatowich