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Of Attorneys for Amicus Curiae, The Confederated Tribes
Of the Warm Springs Reservation of Oregon, Confederated Tribes
Umatilla Indian Reservation, and Yakima Nation

UNITED STATES DISTRICT COURT
DISTRICT OF OREGON

NATIONAL WILDLIFE FEDERATION, et al.,

Plaintiffs

and,

STATE OF OREGON

Intervenor-Plaintiff

v.

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

Defendants,

and

Case No. 01-0640-RE (Lead Case)
CV 05-0023-RE (Consolidated Cases)

DECLARATION OF WILLIAM J.
BOSCH IN SUPPORT OF
MEMORANDUM OF AMICI WARMS
SPRINGS, UMATILLA, AND
YAKAMA TRIBES IN OPPOSITION
TO MOTIONS FOR SUMMARY
JUDGMENT

DECLARATION OF WILLIAM J. BOSCH

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NORTHWEST IRRIGATION UTILITIES,
PUBLIC POWER COUNCIL, WASHINGTON
STATE FARM BUREAU FEDERATION,
FRANKLIN COUNTY FARM BUREAU
FEDERATION, GRANT COUNTY FARM
BUREAU FEDERATION, STATE OF IDAHO,
INLAND PORTS AND NAVIGATION GROUP,
and KOOTENAI TRIBE OF IDAHO,

Intervenor-Defendants.

COLUMBIA SNAKE RIVER IRRIGATORS
ASSOCIATION and EASTERN OREGON
IRRIGATORS ASSOCIATION,

Plaintiffs,

v.

CARLOS M. GUTIERREZ, in his official capacity
as Secretary of Commerce, NOAA FISHERIES,
and D. ROBERT LOHN, in his capacity as
Regional Director of NOAA FISHERIES,

Defendants.

I, WILLIAM J. BOSCH, HEREBY STATE AND DECLARE AS FOLLOWS:

Credentials

1. I hold a Bachelor of Science degree from Gonzaga University and a Master of Science degree from the University of Washington. Since August of 1991 I have been employed as an assistant harvest manager and fisheries data manager for the Yakama Nation fisheries program. My duties have included data collection, synthesis, and technical analysis in support of Yakama Nation research and policy strategies to achieve the restoration of historically present salmon populations throughout the Yakima and Columbia River Basins. I served as chair of the U.S. v Oregon Technical Advisory Committee from 1996-1999. I am lead author or co-author of five publications in the peer-reviewed literature and have also authored or co-authored a number of technical reports in the U.S. v Oregon and Bonneville Power Administration public record.

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Purpose

2. The purpose of my declaration is to provide evidence from available data and the literature which supports the theory that supplementation using hatchery-origin fish can be used to maintain or improve viable salmon population (VSP) parameters (abundance, productivity, spatial structure, and diversity; McElhany et al. 2000). Specifically, I seek to advise the court of the success of several supplementation programs in the Yakima, the upper Columbia, and the Snake River Basins, involving spring Chinook, fall Chinook, coho and steelhead. These are the types of carefully implemented supplementation programs contemplated for development and implementation in the mid and upper Columbia River under the recent Fish Accord Memorandums of Agreement (MOAs). These programs, over a period of years, through carefully proscribed supplementation protocols (e.g., HSRG 2005), have contributed to increases in the number of natural spawners (both listed and unlisted fish) in the river systems where they have been implemented.

3. My intent is not to argue that supplementation is the only path to delisting, as opposed to being just one of many tools available. However, I do want to indicate to the court the facts of the situation in Indian country, facts which other plaintiffs and even the United States have ignored or criticized. Salmon supplementation programs, for the most part being implemented at the tribes' urging and under tribal direction, are providing more natural spawners in numerous areas, a condition that most other proposed remedies have not yet proven able to achieve.

4. Unfortunately, when the court reviews the other declarations in this proceeding, it will find little or no mention of these tribal programs. In fact, Oregon's declaration includes a tacit disparagement of supplementation even as part of the recovery package beyond a "safety net" process. I find this most unfortunate, as not only the programs that I discuss below, but also the

literature I cite, are providing an increasing body of science supporting carefully planned and executed supplementation programs as a means of increasing viable spawning population parameters, of which abundance or the number of natural spawners is a key parameter. I note that for listed populations, the progeny of these natural spawners become part of the listed population upon emergence from the gravel and empirical studies indicate that these fish return and spawn as adult members of the listed population. Rather than debate the many theories about the effects of supplementation on fishery genetics, my intent is simply to inform the court that carefully designed and implemented supplementation programs actually put natural spawners in the river which, without argument, is a key element of salmon restoration and recovery.

5. The following are the supplementation programs with which I have worked and am most familiar.

Spring Chinook

6. The Cle Elum Supplementation and Research Facility (CESRF) is a large hatchery complex (central spawning and rearing facility with three acclimation sites) that was specifically designed to test scientific uncertainties in regard to the adequacy of spring Chinook hatchery supplementation for meeting production objectives and limiting adverse ecological and genetic impacts in the Yakima River Basin (BPA 1996). The CESRF is a central part of the Yakima-Klickitat Fisheries Project (YKFP) which includes a large (~\$4.0 million annual budget) monitoring and evaluation component. The CESRF collected its first spring Chinook brood stock in 1997, released its first fish in 1999, and age-4 adults have been returning since 2001, with the first F2 generation (offspring of CESRF and wild fish spawning in the wild) returning as

adults in 2005. Only wild or natural-origin fish are taken for brood stock in the CESRF program and used to propagate fish which are allowed to spawn in the wild.

7. The Tucannon Fish Hatchery (TFH) is part of the Lower Snake River Compensation Plan (LSRCP) that was authorized by Congress to help mitigate for the losses of salmon and steelhead runs due to construction and operation of the Snake River dams. One of the hatchery's objectives is to compensate for the estimated annual loss of 1,152 Tucannon River spring Chinook salmon adults caused by hydroelectric projects on the Snake River. The TFH operates as a supplementation program and the Washington Department of Fish and Wildlife (WDFW) has been evaluating the success of the TFH in meeting the mitigation goal, and identifying factors that would improve performance of the hatchery fish (Gallinat and Ross 2007). This too is a carefully monitored program using local fish from the Tucannon river area and incorporates a large percentage of natural-origin fish into the brood stock.

9. The following figures and discussion document some of the preliminary results from these two programs.

10. Figure 1. Actual returns (green bar) of age-4 Upper Yakima spring chinook to the Yakima River mouth compared to estimated returns if the Cle Elum Supplementation and Research Facility (CESRF) had not been constructed. Data are for return years 2001-2007, the first seven years of age-4 returns from the CESRF.

11. Methods and Discussion: Brood stock for the CESRF program are collected, and adult returns are enumerated at Roza Dam located in the mid-Yakima River about 200 kilometers upstream of its confluence with the Columbia River. For all years, actual returns with supplementation (green bars) are derived from actual counts of marked (CESRF) and unmarked (wild/natural) fish at Roza Dam backed through harvest to the Yakima River mouth. For F1

returns (returns from wild fish spawned in the hatchery) in 2001-2004, the yellow bars (estimated returns without supplementation) are calculated as the actual returns of unmarked (wild) fish at Roza backed to the river mouth plus estimated returns from fish taken for CESRF broodstock had these fish been allowed to spawn in the wild and returned at observed wild/natural return per spawner rates. For F2 and later generation returns from 2005 forward (where wild/natural returns are comprised of crosses of wild/natural and CESRF fish spawning together in the wild), estimated returns without supplementation are calculated as if the estimated “without supplementation” return four years earlier had been the total escapement, spawned in the wild, and their progeny returned at observed wild/natural return per spawner rates. Using this method the estimated benefit (increase in abundance of natural spawners) from supplementation ranged from 13% in return year 2003 to 137% in return year 2006 and averaged 75% from 2001-2007.

12. Figure 2. Return per spawner (adult-to-adult productivity) rates for natural- (red bars) and hatchery-origin (yellow bars) spring Chinook in the Tucannon and Yakima Rivers.

13. Methods and Discussion: Note the proportion of time the natural (red bars) returns are at or below the replacement (blue) line. For the Tucannon River, based on adult returns from the 1985-2002 broods, naturally reared salmon produced only 0.6 adults for every spawner, while hatchery reared supplementation fish produced 1.7 adults. For the Yakima River, based on adult returns from the 1997-2003 broods, naturally reared salmon produced only 1.1 adults for every spawner, while hatchery reared supplementation fish produced 5.2 adults. As reported in Gallinat and Ross (2007), “in many ways the hatchery program has helped conserve the natural population by returning adults to spawn in the river”.

14. Figure 3. Teanaway River Spring Chinook Redd Counts, 1981 – 2007 and changes in the spatial distribution and percentage of natural origin spawners since CESRF fish began returning to the natural spawning grounds in 2002

15. Methods and Discussion: Redd surveys in the Yakima River Basin have been conducted annually by Yakama Nation staff since 1981. Of critical importance to the scientific debate over the validity of supplementation increases are the redd survey totals for the upper Yakima R. and Naches R. (a major tributary of the Yakima river, which joins the Yakima R. in the city of Yakima at about river kilometer 187, and which is used as a control stream for the CESRF study). Redd surveys conducted from 1981 to 2006 indicated that the number of spawners increased for both populations during the post-supplementation period (2001-2006) but the average number of redds increased 247% in the upper Yakima vs. 201% for the unsupplemented Naches River (May et al. 2007). These results suggest that supplementation increased the number of spawners in the upper Yakima beyond the natural increases associated with improved ocean survival. These empirical data contradict the claims of those who say improved ocean productivity is solely or primarily responsible for the increase in adult returns observed in recent years for many Columbia River salmon populations. To the best of my knowledge, this is one of few and perhaps the only study of closely connected tributaries like the Yakima and the Naches that deals precisely with this issue. As I note the figures are clear that during the 6 years of the study, regardless of ocean conditions, naturally spawning fish increased significantly in the supplemented Yakima arm above those in the unsupplemented Naches. Thus, it is incorrect for anyone to assert that abundance increases in supplemented streams are solely due to ocean conditions and not, at least in part, to supplementation.

16. The Jack Creek acclimation site located on the Teanaway River, another tributary of the Yakima river located near Cle Elum Washington (~rkm 280), began releasing CESRF spring chinook in 1998, with the first age-4 females returning from these releases in 2002. The acclimation sites were designed with the specific intent to allow fish to imprint and return to spawn in the river (as opposed to a hatchery). In 2006, the first year offspring of naturally spawning supplementation fish returned, the percentage of “natural origin” spawners increased from 0.25-1.23 % to 4.27% (May et al. 2007). These data and an increase in the number of redds from 3.0 (± 1.82) to 69.0 (± 22.1) since the initiation of juvenile releases from the Jack Creek acclimation site suggest that supplementation fish spawn successfully in the wild and have the ability to greatly increase the numbers of natural fish in the river.

17. As a critical component of the CESRF program, the Yakamas are implementing significant habitat improvements in the river so that when the fish return they have much improved spawning and rearing conditions, which I and others on our team believe contribute substantially to the ongoing success of this program. This is precisely the type of combined effort that will be implemented in the mid and upper Columbia under the BIOP and the MOA. Like the “Field of Dreams”, the intent is to not only build the field (habitat improvement), but also to go a step further and provide the bats and balls (supplementation) so that “they will come”.

18. For additional data and supporting information, see:

Bosch, B. 2008. Summary of Data Collected by the Yakama Nation relative to Yakima River Spring Chinook Salmon and the Cle Elum Spring Chinook Supplementation and Research Facility. Appendix A in Sampson et al., Yakima/Klickitat Fisheries Project Monitoring and Evaluation; Yakima Substation, 2007-2008 Annual Report, Project No. 199506325, 228 electronic pages, (BPA Report DOE/BP-00035037-1).

Coho

Yakima Basin

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