



# MAKAH TRIBE

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**APR 06 2015**

March 17, 2015

**NOAA-NMFS**  
**LACEY, WA**

Tim Tynan  
NMFS - Salmon Recovery Division  
510 Desmond Drive, Suite 103  
Lacey, WA 98503

Re: Lake Ozette Sockeye Hatchery Genetic Management Plan extension request

Dear Mr. Tynan:

A primary objective of the Makah Tribes' Lake Ozette sockeye supplementation program is to restore the abundance and the range of naturally spawning sockeye into suitable tributary habitats such that the resulting populations will become self-sustaining throughout each of their four distinct brood cycles. The program includes research, monitoring, and evaluation activities designed to determine success in recovering the propagated populations to viable spawning aggregations. While we believe that the reintroduction results to date have demonstrated the effectiveness of the Umbrella Creek Hatchery program to increase tributary spawner abundance and to expand their spawning range, gaps still remain in fully achieving our goal to consistently populate all four of the brood lines in the Umbrella Creek and Big River watersheds. We therefore request an extension of the 2003 4(d) Rule Limit 6 Evaluation and Recommended Determination beyond the original twelve year timeframe of the Umbrella Creek/Big River sockeye supplementation program as referenced in the 4(d) Rule Limit 6 Evaluation.

*"...If, after 12 years, the program is meeting performance standards, and is expected to achieve, but has not yet fully accomplished, program goals, continuation of specific components of the program will be proposed and reevaluated." (NMFS, 2003)*

## Background

A recent QA/QC assessment performed by Mike Haggerty Consulting (<http://www.mhaggertyconsulting.com/>) detected several anomalies between the summary data used to generate the values in a draft Appendix that accompanied the draft extension request letter dated September 10, 2014. Because the Umbrella Creek spawner escapement is a subset of the Lake Ozette adult returns and the Umbrella Creek estimates for four brood years (2004, 2006, 2009, & 2010) exceeded the corresponding total run size for the entire lake, as reported in *A Summary of Lake Ozette Sockeye Salmon Run-Size Estimates for Return Years 2004 through 2012* (Haggerty, 2014), we reassessed our escapement estimate methodology in conjunction with Haggerty Consulting to produce the summary tables included with this HGMP extension request.

### **Brood stock acquisition**

The Makah Tribe has operated a sockeye supplementation hatchery at River Mile 4.5 of Umbrella Creek since 1982. The first documented evidence of tributary spawning in Umbrella Creek since the program started was noted in 1991, the result of an unscheduled fed fry release at the Umbrella Creek Hatchery in 1988. Prior to this release, all hatchery progeny were trucked downstream and released into or near Lake Ozette. The brood stock for this program has been derived from various sources including: an initial single brood year of Lake Quinault sourced eggs in 1982; Lake Ozette beach spawners from brood years 1983 through 1999, supplemented with Umbrella Creek adult returns in 1991 and 1997 (2 pair and 2 males respectively); and from Umbrella Creek returns exclusively since 2000.

A seasonal floating weir has been used to monitor adult sockeye spawner abundance in Umbrella Creek and to collect brood stock for the Tribe's sockeye supplementation hatchery program since 2000. The sockeye are trapped at the Umbrella Creek weir, located at river mile 1.0, throughout the October 1 through December 31 migration period. They are proportionally distributed between those retained for brood stock and those released upstream to spawn naturally.

Fish released upstream receive Peterson disk tags to facilitate the population estimate study. The total adult sockeye population estimates generated by the annual tag/recapture study have ranged from 49 to 5,152 between Brood years 2000 and 2012, exhibiting fluctuating degrees of certainty, a consequence of variable weir capture efficiencies and carcass recovery rates, as shown in Tables 1 & 2.

The authorized brood stock retention rate is the lesser of 15% of the annual return or 100 pair (+10%). The programs' brood stock, as few as 45 adults to as many as 238 adults as detailed in Table 3, are transported upriver to the Umbrella Creek Hatchery and held for ripening. The median brood stock retention rate has been 7.0 % of the total estimated Umbrella Creek escapement since 2000, excluding Brood Year 2007 where a higher percentage was retained following consultation with NOAA staff.

The primary indicator of hatchery origin during the early years of the program was the absence of an adipose fin. Relying on an adipose fin clip as the sole hatchery origin identifier was problematic due to the inability to clip extremely small fish and the frequent erroneous identification of naturally eroded fins of adult carcasses as fin-clipped. We subsequently shifted to otolith mark analysis as the primary identifier of origin. The values shown in Table 4 provide a vital tool to monitor the effectiveness of the supplementation program. These calculated population estimates are based upon mark and recapture rates, and the ability to adequately detect the presence or absence of hatchery marks in the returning adults. This analysis of brood stock and carcasses of natural tributary spawning adult sockeye reveal that the tributary population is comprised of natural origin recruits (NOR's) and F1 hatchery returns (HOR's). The median NOR contribution from brood years 2000 through 2012 has been 85.5% with a range from 50.4% to 96.5% as detailed in Table 4. We have also included Table 5 to clarify the sampling effort and the relative strength of the HOR:NOR expansions used throughout the Appendix to populate the various tables.

### **Spawner surveys**

MFM personnel conduct sockeye spawner surveys throughout the Lake Ozette watershed as part of the sockeye monitoring program. The areas routinely surveyed since 2000 include: Allen's and Olson's beaches, the two primary beach spawning sites within Lake Ozette;

Umbrella Creek (3.98 miles); Big River (6.91 miles); and Crooked Creek (0.5 miles). The data collected during these index survey efforts include species, live and dead sockeye counts, redd counts, other species observed, and presence/absence of Petersen tags associated with the Umbrella Creek escapement estimate program. Additional sockeye abundance information is obtained through supplemental sockeye surveys conducted outside of the normal boundaries of the aforementioned index areas, and from surveys targeting other species during the timeframe that sockeye would reasonably be present (e.g. Coho).

In conjunction with hatchery mark analysis data, survey results have demonstrated that less than 0.72% of all samples collected from Allen's and Olson's beaches since 2000 have been identified as having hatchery origins. Conversely, a recent supplemental survey detected 215 naturally spawning sockeye in a one mile reach located two miles upstream of the uppermost index survey reach in Umbrella Creek. This suggests that the goal to avoid hatchery origin adult straying into the lake spawning population has been successful and those adults are recolonizing the tributaries and contributing to an expanding naturally spawning tributary population.

The escapement data for Umbrella Creek, as previously described, has been generated through the mark/recapture program at the Umbrella creek weir. Because no similar population estimate mechanism currently exists for the other tributary areas utilized by returning sockeye, we can only reliably report maximum one day peak counts for these areas. To that end we've included peak counts by year for progeny returning to the Big River/Stony Creek release location as Table 6. Those peaks range from zero to 56.84 fish/mile between 2000 and 2012.

### **Incubation**

The incubation protocols for this program have evolved from the simple streamside bulk incubators of the 1980's to the single family incubation units supplied with a filtered, UV sterilized water supply currently in use. The evolution of these protocols has striven to minimize risk and to embrace new technologies relevant to safely implementing the Lake Ozette sockeye supplementation program. In addition to providing greater security to the gametes procured through the brood stock program, in cooperation with the Makah National Fish Hatchery the current incubation regime affords us the ability to safely and efficiently differentially mass mark the otoliths of 100% of the hatchery progeny.

The sockeye salmon egg and fry propagated through the hatchery program have had high median survival rates, averaging 86.9% for the green to eyed egg stage, 95.0% for the eyed egg to swim-up fry stage, and 94.4% during the final rearing stage as detailed in Table 7.

### **Rearing & Release**

Rearing and release protocols have evolved to enable more precise monitoring of the contributions of the hatchery program. A summary only listing of the hatchery releases since the inception of the hatchery program in 1982 is included as Table 8. A more detailed summary is also included as Table 9.

The detailed releases summary (Table 9) reveals that our greatest challenges to achieving greater rearing survival include:

1. river otter predation of fry and fingerlings and adults within the rearing and trap units,
2. water supply interruptions/limitations resulting in overcrowding,
3. IHNV (infectious hematopoietic necrosis virus) outbreaks.

We've continuously modified the rearing unit covers at both hatcheries to thwart otter predation and believe that we finally have otter-proof rearing units. Adult predation appears to have resolved with the installation of an Acoustic Deterrent Device on loan from NMFS. We are increasing the size of the rearing units and exploring other options to maintain rearing conditions within safe rearing capacity parameters. In addition to our routine adult fish health monitoring, we are also exploring alternative water sources and rearing strategies to minimize hatchery progeny exposure to disease.

#### **Basis for Extension Request**

To help visualize the relationships between and within the brood cycles that make up the Lake Ozette sockeye population, we've color-coded the four base brood lines as blue, green, red, or yellow. As evident from Table 8, the hatchery program has released 2 blue, 2 green (Brood Year 2003 release only 1,500 fry) 4 red, and 4 yellow brood cycles at the Umbrella hatchery since the stock was listed as threatened. Similarly, we've released 2 blue, 1 green, 3 red, and 4 yellow brood cycle lines during the same period at the Stony Creek Hatchery. We therefore have a minimum of 5 brood line release gaps between the two hatchery locations, 3 green and 2 blue, before we effectively reach the initial goal of seeding the equivalent of 3 complete brood cycles in the targeted tributaries as described in the Lake Ozette Sockeye Recovery Plan.

As the information in the attached Appendix demonstrates that the Umbrella Creek hatchery program does not appear to be negatively impacting the ESA listed Lake Ozette beach spawning population and has not yet realized the goal of fully seeding the available tributary habitat, we respectfully request an extension of the Umbrella Creek and Stony Creek hatchery programs to enable us to meet those goals and to develop strategies to aid in the continuing recovery of Lake Ozette sockeye. We further propose to continue to utilize adult returns to Umbrella Creek as the gamete donor source for the program.

If you have any further questions or comments, please contact Russell Svec, Makah Fisheries Director, at (360) 645-3160.

Sincerely,

Makah Tribal Council



Timothy J. Greene Sr.  
Chairman