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December 20, 2016

Chris Yates, Assistant Regional Administrator
Protected Resources Division
NMFS, West Coast Regional Office
1201 NE. Lloyd Blvd., Suite 1100
Portland, OR 97232

Attn: Claire McGrath

Re: Proposed Changes to Listed Salmon and Steelhead Hatchery Programs, 81 Fed. Reg. 72759

Dear Mr. Yates:

I am submitting these comments as a private citizen to oppose NOAA's proposal to list 23 hatchery salmon and steelhead populations under the Endangered Species Act (ESA*). Revisions to Hatchery Programs Included as Part of Pacific Salmon and Steelhead Species Listed Under the Endangered Species Act*, 81 Fed. Reg. 72759. The ESA affirmatively commands NOAA to insure that actions it authorizes, funds, or carries out do not jeopardize the continued existence of an endangered species. NOAA's proposed revisions do not appear to comply with this mandate. Further, NOAA's notice fails to provide necessary information needed for the public to participate meaningfully in this rule making process.[1] NOAA's notice is replete with conclusions, while being nearly devoid of the scientific basis or facts that NOAA used to reach these conclusions. The proposed revisions appear to be a reckless scheme that creates jeopardy to the ESA-listed salmon and steelhead, and one that will lead to the demise of Pacific salmon and steelhead throughout their range. NOAA should withdraw its current notice and publish a new notice that contains sufficient information to permit meaningful public participation into this rule-making process.

General Comments Based on Available Information

Except to the extent that a hatchery program conserves the unique genetic identity of a wild fish population and promotes that population's recovery, the bottom line is that the Endangered Species Act was not enacted to protect hatchery fish that can be produced by the millions. It does not seem plausible that these "production" fish can go extinct

[1] Simply stating that supporting documents may be found on NOAA's west coast website is not sufficient, particularly when the link is incorrect.

throughout their range, if one considers that their range is a hatchery, especially given the fact that decades of science has established that outside their range, hatchery fish present a genetic and environmental danger to wild fish. Pure and simple, there is little evidence to suggest that hatchery fish contribute to the survival or recovery of ESA-listed wild Pacific salmonids, while there is ample evidence to establish that hatchery fish hasten the decline of wild fish by significantly disrupting essential behavioral patterns, including, breeding, feeding and sheltering. This is specifically prohibited by the ESA.

The scientific record establishes clearly that Puget Sound, Salish Sea, and West Coast hatchery production expansion over the last decades, including expansion of hatcheries on the Columbia and Snake Rivers, has not worked to recover ESA-listed salmon or steelhead. As NOAA recognizes, at best, the listed populations have remained "stable," and this is only if NOAA counts the increasingly higher percentage of returning hatchery fish in the "stability" analysis.

In fact, the consensus of scientific studies, especially the growing body of evidence over the past decades, is that hatchery fish harm wild fish population survival and recovery in many ways. One manner in which hatchery fish harm wild fish is through genetic dilution from hatchery fish spawning with wild fish to make "natural" fish. These natural fish are less able to survive than wild fish, because their genetics are diluted with the genetics of hatchery fish. Indeed, it is more than a little ironic for NOAA now to use this genetic dilution that it has perpetrated, to establish the similarity of hatchery fish to wild fish. Hatchery fish also hasten the decline of ESA-listed wild fish due to their ability to outcompete wild fish, their creation of artificially elevated density dependence, their predation on wild fish, and their reduction of reproductive success for both wild and hatchery fish, among other things.

Moreover, NOAA has determined that artificial propagation serves to exacerbate the negative effects of adverse environmental conditions, e.g., a warming climate, drought, and poor ocean conditions. With ocean conditions expected to be poor in the upcoming years and global warming intensifying, NOAA should be moving in the opposite direction from hatcheries, and doing everything possible to strengthen wild fish populations and prevent genetic dilution.

This means using hatcheries strictly for harvest and implementing a zero tolerance for hatchery fish to rear or spawn in rivers and streams, except where wild fish already have gone extinct. NOAA's own research establishes that the shear number and size of hatchery juveniles dumped into rivers and streams allows those fish to outcompete wild (now "natural") fish on rearing grounds. The results are similar for returning adult hatchery fish that NOAA permits to spawn "naturally" with wild fish.

Moreover, ecological survival and population propagation is not strictly a numbers game. Another result of genetic dilution is that salmon and steelhead are becoming smaller and smaller, faster and faster as the fish return to their natal spawning grounds

earlier and earlier. Long gone are the days of plentiful 20 to 50 pounders. This has an adverse effect on salmon predators that require the highest quality of prey in order to achieve and sustain their populations. For example, the critically endangered Southern Resident Killer Whales (SRKWs) evolved over thousands of years to prey on the largest wild Chinook available, often 50 to 100 pounders. Since such fish rarely, if ever, exist these days, the SRKWs are required to capture two to five times more salmon than a few decades earlier.

Resident orca sampling supports the conclusion that having to chase younger, smaller, less fatty salmon, usually less than twenty pounds, instead of one equivalent five to seven year old 60 pound plus Chinook produced in the wild, has lead to orca biogenetic and energetic expenditures. Combined with a higher toxic load due to increased bioaccumulation from preying on smaller urban fish, inadequate prey has resulted in the resident orcas' decreased ability to develop, bear, and rear offspring, increased abortions and reabsorption of fetuses, and increased postpartum mortality due to emaciation and disease.

Comments on NOAA's Rule-Making Deficiencies
Because NOAA's Federal Register notice is nearly devoid of facts, it is inadequate to provide sufficient information for the public to evaluate NOAA's decision to list the proposed hatchery fish under the ESA. For example, a few questions that arise immediately from the scarcity of information are:

- What baseline did NOAA use to determine the genetics of each wild fish population?
- What baseline did NOAA use to determine the genetics of each hatchery fish population?
- What standard did NOAA use to determine whether a hatchery stock "exhibit[s] a level of genetic divergence relative to the local natural population(s) that is not more than what occurs within the ESU/DPS?"
- What documents set forth the scientific basis or studies NOAA used to determine the level of genetic divergence between a hatchery population and an ESA-listed ESU/DPS?
- How recent are the studies that NOAA used to determine the level of genetic divergence between a hatchery population and an ESA-listed ESU/DPS? Are those studies outdated?
- Where is the data for each hatchery population NOAA proposes to list under the ESA that quantitatively assesses its relative level of genetic divergence from the ESA-listed species?
- Where is the data for each hatchery population NOAA proposes to list under the ESA that establishes the stock has not diverged from the evolutionary lineage

represented by the ESU?

- Where are the documents that set forth the reproduction success rates of the genetically similar hatchery fish to establish whether they can promote wild fish recovery?

NOAA's failure to provide the scientific basis and facts on which it relied in making the listing decisions deprives the public of a meaningful opportunity to provide input into the listing process, and makes it impossible to determine if NOAA followed its own procedures. For instance, NOAA's *Policy on the Consideration of Hatchery-Origin Fish in Endangered Species Act Listing Determinations for Pacific Salmon and Steelhea*d ("*ESU Policy*"), 70 Fed. Reg. 37204, (June 28, 2005) states:

> Status determinations for Pacific salmon and steelhead ESUs generally consider four key attributes: abundance; productivity; genetic diversity; and spatial distribution. The effects of hatchery fish on the status of an ESU will depend on which of the four key attributes are currently limiting the ESU, and how the hatchery fish within the ESU affect each of the attributes.

While NOAA stated that it used these criteria to *guide* its review, the word "guide" is sufficiently ambiguous to raise questions regarding the procedures NOAA actually followed. In addition, NOAA's notice fails to provide the scientific basis or evidence on which its decisions to include hatchery fish in specific populations are based. Suspicions regarding NOAA's scientific methods are raised even more when NOAA, without explanation, proposes to switch one hatchery population from one genetically unique ESA-listed population to a different population, as NOAA did in its revisions.

At minimum NOAA should provide links to it methodology and the science and facts on which it relied in proposing to list the hatchery fish under the ESA, to permit the public to assess the validity of NOAA's decisions. NOAA should include links to the Jones (2015) internal NMFS' genetic report, as well as links to each 5 year salmon or steelhead review, assuming those reports contain sufficient facts to permit the public to make an informed assessment of NOAA's listing decisions.

Perhaps as significant, NOAA fails to set forth the baseline it used for determining the amount of genetic divergence of hatchery fish to wild fish. Sound science would seem to dictate that the baseline for wild fish would be the ***earliest*** genetic analysis that exists for a particular ESA-listed population, while the baseline for hatchery fish would be the genetic analysis of the ***latest*** hatchery population. To do otherwise, runs the risk of rewarding the genetic dilution of the wild fish. It further runs the risk of comparing hatchery fish to recent generations of naturally spawning hatchery origin fish, or comparing hatchery fish to the severely diluted genetics of older generations of natural fish, as opposed to the genetics of the wild fish originally listed under the ESA. One would expect the former comparison to find a quite close genetic similarity between

hatchery fish and most "natural" fish. On the other hand, using the original wild genetics of the listed ESU/DPS of each species at the time it was listed likely would lead to a quite different conclusion, and would avoid the problem of continually shifting baselines that could lead to the extinction of the listed wild salmon and steelhead.

Conclusion
In its *ESU Policy* NOAA states:

> We recognize that artificial propagation under certain circumstances can pose threats to natural populations, such as when it results in genetic dilution or direct competition with native populations. We also recognize that hatchery stocks may exhibit differences in behavior, genetic composition, morphological traits, and reproductive fitness from natural populations. However, conservation hatchery stocks under certain circumstances may exhibit few selective differences from the local natural population(s), and they may reduce the immediacy of extinction risk for an ESU. We think it is inappropriate to make universal conclusions about all hatchery stocks, ***but think their relatedness to natural populations and the relative risks and benefits they pose need to be evaluated on a case-by-case basis***.

To provide the public with adequate information to participate meaningfully in NOAA's listing proposal, NOAA should withdraw its notice published on October 21, 2016, and publish a revised notice that sets forth the relative risks and benefits, as well as the science and facts that support those risks and benefits, that NOAA evaluated on a case-by-case basis, of including each hatchery stock in an ESA-listed salmon or steelhead ESU/DPS. In the alternative, in its revised notice, NOAA should provide links to all significant documents that contain the information on which NOAA based each of its ESU/DPS revision decisions, and set forth the specific segments that provide the scientific basis and facts for each revision NOAA made.

Respectfully,

Sharon Grace

Sharon Grace

cc: File