

Pacific Rivers Council's
Proposed Hatchery Policy Comments
November 12, 2004

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Re: *Hatchery Listing Policy*

Dear Chief:

Thank you for the opportunity to comment on the Hatchery Listing Policy. We have reviewed the Hatchery Listing Policy, and we wish to raise several concerns about the policy. We strongly support attempts to conserve and recover Pacific salmon and steelhead by addressing the factors that have driven their decline. However, we disagree with your conclusion that hatcheries can be used to further conservation or recovery. The best available science indicates that habitat restoration, not hatcheries, is critical to recovering wild populations of steelhead and salmon. Hatcheries are highly likely to contribute to the decline of wild populations, and any expectations that they could contribute to population recovery are specious, speculative, and unwarranted by available scientific information. Furthermore, the Endangered Species Act (ESA) is intended to protect native, wild species in their natural habitat, not artificially propagated species in man-made habitat. Therefore, hatchery fish should not be considered in listing decisions, except as threats to wild populations. Furthermore, any policy that NOAA Fisheries develops regarding hatchery fish should not compromise conservation of Pacific salmon and steelhead in the wild. Finally, the presence or abundance of hatchery-produced fish, whether putatively similar or not to a particular wild population, should never be used to substantiate or support any claim that wild fish should be delisted.

Hatchery fish must not be considered in wild fish listing determinations, except as threats to wild populations

The ESA requires that NOAA Fisheries use the "best scientific . . . data available" when making listing determinations. 16 U.S.C. § 1533(b)(1)(A). Current scientific studies amply demonstrate that hatcheries pose a threat to wild populations of salmon and steelhead. (Chilcote 2003, ISAB 2003, Levin et al. 2001, Lichatowitch 1999, Myers et al. 2004, Nelsen et al. 1991, Nickelson 2003, NMFS 2000). In fact, NOAA Fisheries has taken this position for many years. Furthermore, the science indicates that hatcheries do not and should not be expected to contribute to the long-term survival of these wild fish. (*See e.g.* Nickelson et al. (1986)). According to the summary of the policy provided in the

Federal Register, the Interim Policy on Artificial (hatchery) Propagation of Pacific Salmon under the Endangered Species Act requires revision “to take into account the results of scientific research that has occurred over the past decade.” 69 Fed. Reg. 31,354, 31,355 (June 3, 2004). In fact, scientific research over the last decade has only substantiated the theory that hatcheries are a contributing factor in the decline of Pacific salmon and steelhead and cannot be used for recovery. Thus, while the science may be a reason to adopt a stronger policy to limit adverse impacts of hatcheries upon wild fish, it does not justify a NOAA Fisheries shift to a policy that claims hatchery fish present benefits to wild fish or can contribute to the recovery of wild fish, and that incorporates these erroneous claims in listing determinations.

It is disingenuous to suggest that the science somehow required revision of a policy that limited listing of salmon to only wild salmon. Reference to recent scientific research as a reason for the change is an attempt to mask the real reason for the inclusion of hatchery fish in listing determinations, which is politics, not science. That politics drove this decision is readily apparent considering that NOAA Fisheries ignored its own panel of outside scientists, who recommended that hatchery fish *should not* be included in listing determinations for wild fish. (Myers et al. 2004). There is no new, and no old, scientific research that establishes that hatchery fish have contributed to the long-term survival of a wild salmon population. Any claims to the contrary are speculative and should not be considered the best available science for purposes of ESA status reviews and listing determinations.

The Best Available Science

1) Hatchery fish pose a threat to wild populations

Hatchery fish are one of the major causes for the declines of naturally-spawning salmon. NOAA Fisheries has repeatedly recognized that hatchery fish harm wild populations. *See* 58 Fed. Reg. 17,573, 17,574 (April 5, 1993) (stating "genetic and ecological risks of artificial propagation can pose serious threats to natural populations"); 60 Fed. Reg. 37,011, 38,025 (July 25, 1995) ("Potential problems associated with hatchery programs include genetic impacts on indigenous, naturally reproducing populations (see Waples 1991), disease transmission, predation on wild fish, difficulty in determination of wild run status due to incomplete marking of hatchery releases, and replacement (rather than supplementation) of wild species through competition and continued annual introductions of hatchery fish.") NOAA Fisheries acknowledges the negative impacts of hatcheries in the Federal Register notice for the revised hatchery policy. These threats and sources of harm from hatchery practices and hatchery fish include behavioral changes, deleterious genetic effects, increased diseases, competition, and increase predation upon natural populations. 69 Fed. Reg. 31,354, 31356 (June 3, 2004). Many scientific studies have recognized the threats to wild salmon that arise when hatchery and wild fish interact. (Einum and Fleming 2001, Flagg et al. 2000, ISG 1996, NRC 1996, Flagg and Nash, 1999, Chilcote 2002). These threats are well substantiated, unlike the purported benefits of hatcheries; therefore, NOAA Fisheries should continue to consider only the negative impacts of hatcheries when making listing determinations for Pacific salmon and steelhead.

2) Hatchery fish do not contribute to wild salmon recovery; therefore, they should not be considered a positive contribution to the status of an ESU when NOAA Fisheries makes a listing determination.

The critical problem undermining wild salmon and steelhead recovery is habitat degradation. A scientifically defensible plan to recover wild salmon would focus on habitat restoration, and not propose hatcheries as a potential means to recover wild. Similarly, a scientifically defensible plan for listing wild salmon should not rely upon hatcheries as a potential contribution to the status of wild populations. Hatchery fish do not contribute to wild fish recovery; instead, the large numbers of fish generated by hatcheries mask the underlying habitat degradation that limits salmon recovery. Hatcheries only address the symptoms of declining populations; they do not address the underlying problems that have caused populations to decline in the first place. Furthermore, although they may address the symptom of reduced numbers in the short term, in fact, they cause long term harm to recovering wild populations. As explained by the Recovery Science Review Panel, "[i]n all examples that the RSRP has been able to locate, when experiments were conducted to test claims for the success of hatcheries in promoting the conservation of naturally spawning fish, the initial claims have been proven false." (RSRP 2003, at 4).

NOAA Fisheries claims that hatcheries present potential benefits for salmon and steelhead populations. NOAA Fisheries nevertheless acknowledges that these potential benefits are short-term. In the long run, hatcheries pose a threat to salmonid populations. Again, NOAA Fisheries acknowledges that "long-term deleterious consequences of . . . supplementation may outweigh the short-term advantage of increased population size." *Id.* The goal of the ESA is to recover populations to the point where they are self-sustaining in their native habitat. *See* 16 U.S.C. § 1531(b); 1532 (3) (stating the purpose of conserving listed species and defining conservation). This is a long-term recovery goal. Thus, recovery of wild salmon and steelhead requires long-term solutions. It is not scientifically defensible to claim that hatcheries benefit salmonid populations by focusing on short-term benefits that are followed by long-term harm. The science demonstrates that overall, hatcheries are harmful. It is true that when certain salmonid populations decline to near extinction, certain hatchery measures could serve to preserve some measure of their genetic diversity. However, this is a very narrow exception to the majority of evidence which indicates that hatcheries do not aid in the recovery of wild salmonids, and it would only apply to populations that are endangered, restricted in range and number of populations, and in danger of imminent extinction. Moreover, even in this situation the adverse consequences of disrupting natural breeding systems, disease, and behavioral alteration can cause genetic harm likely to offset much of the potential gain associated with increased population size in the hatchery.

Even if hatchery fish can contribute to larger numbers of fish in an ESU, those fish cannot contribute except in the most superficial and transient sense to recovery if they are released into habitat that is inadequate in quantity or quality to sustain naturally productive populations. If the wild fish cannot sustain themselves because of poor habitat, hatchery fish cannot fundamentally

improve the health or population viability of the runs, and any apparent alleviation of endangerment is purely superficial. If hatchery fish must be continually pumped into the system to keep numbers up, not only will this elevate the risk of long-term harm to the wild population, but it is also clear that the hatchery fish are doing nothing to improve the status and productivity, hence viability, of the wild fish. The fact is, and as the hatchery policy points out, there is very little data regarding potential benefits from hatcheries. If NOAA Fisheries would like to more explicitly and transparently explain the role of hatchery fish in listing determinations, then it should explicitly state that there is no clear evidence that hatchery fish contribute "to the overall viability of the ESU," nor that the "presence of hatchery fish within the ESU might have the potential for reducing the risk of extinction of the ESU or the likelihood that the ESU would become endangered in the foreseeable future." 69 Fed. Reg. at 31,366. On the other hand, NOAA Fisheries should point out that ample evidence demonstrates that hatcheries are "a factor in the decline of naturally spawned populations." *Id.* Any claim or presumption that a hatchery fish can play a role in recovery of an extant salmon population or distinct population segment can and should be addressed in the recovery plan for the listed species, and through appropriate application of parts of the ESA concerning designation of experimental and nonessential populations.

A Recent Study: The Oosterhout and Huntington paper

The hatchery policy makes numerous references to uncertainty in hatchery effects but nevertheless makes the assumption that hatcheries may contribute to recovery of wild spawned fish. A recent, attached, modeling study using the Oregon Coast coho analyzes the potential contributions of hatcheries, attempting to determine whether they can realistically be expected to assist with conservation. (Oosterhout and Huntington, July 1, 2003). This investigation was prepared by independent scientists, who used conditions that modeled an idealized "conservation hatchery" program, the kind of hatchery that the hatchery policy claims can be used to help improve the viability of wild spawned fish. The authors modeled three possible scenarios for using conservation hatcheries to benefit Oregon Coastal coho. The first scenario involved supplementing reaches with poor quality habitat, where wild populations might be diminished; the second scenario involved supplementing wild populations when ocean conditions were poor; the final scenario involved supplementing wild populations after habitat was restored, in order to spur on recovery more quickly after restoration. Despite the authors' use of idealized hatchery conditions, the authors of the study concluded that even the most "perfect" hatchery will confer no long-term benefit to the Oregon Coast coho, for any scenario. Furthermore, such a hatchery intervention accuses short-term elevated risk of ecological and genetic harm to the coho. The study pointed out, however, that habitat restoration was likely to provide the greatest benefits for recovery. Habitat restoration generated long-term benefits without causing genetic or ecological risks to wild fish.

3) Response to a recent published paper

The recently published paper by E.L. Brannon et al., "The controversy about salmon hatcheries" (*Fisheries* 29(9) 12-31), which NOAA Fisheries may be tempted to rely on to justify this policy, is highly controversial and is likely to receive heavy published criticism in the near future. We

advise not relying on the tenuous and contentious conclusions of this paper to develop or justify elements of a hatchery listing policy. This paper reinterprets previously published studies, and references several preliminary, unpublished studies, to argue that hatchery fish could be cultured in a way that reduces the many harms that hatchery fish are known to cause when they are released and commingle with wild salmon. They also argue that theoretically “improved” hatchery fish could have higher survival rates in the wild than have been reported in the extensive existing literature showing consistently low rates of survival-to-return of hatchery-origin salmon. Brannon et al.’s claims are not supported by the published literature they cite, and the authors of cited papers that we have spoken with find Brannon et al.’s interpretations of their data to be objectionable, not compelling, and sometimes just plain wrong. Brannon et al. claim to bring “balance” to the question of the role of hatchery fish in wild population restoration, but in this attempt they bring no new data, only biased and strained or incredible interpretations of the many past studies whose results soundly contradict Brannon et al.’s views. The individual claims and errors of fact and interpretation made in Brannon et al. are too numerous for us to itemize here. Suffice it report that we are confident that Brannon et al.’s paper and the claims made within it will be the subject of detailed and resounding rebuttal by peers in the coming months. It would be unwise and hazardous to base public policy on the claims made in this paper, which fly in the face of a large body of previously published work and the scientific reviews and recommendations of NOAA Fisheries’ own research scientists, as referred to elsewhere in these comments.

The Law

1) Alsea Valley Alliance

NOAA Fisheries relies on *Alsea Valley Alliance v. Evans (Alsea Valley)*, 161 F. Supp.2d 1154 (D.Or. 2001), as a reason for revising the prior hatchery policy. The *Alsea Valley* decision determined that NOAA Fisheries' interpretation of section 3(16) and 4(1) of the ESA were flawed. *Id.* Specifically, the judge faulted NOAA Fisheries for listing only a portion of a distinct population segment. Under *Alsea Valley*, NOAA Fisheries created this problem by the manner it chose to implement the ESA: defining distinct populations segments, and then trying to further subdivide these distinct populations segments.

Despite the judge's conclusion, nothing in *Alsea Valley* requires NOAA Fisheries to adopt a new policy that is contrary to the science or to the Endangered Species Act *as a whole*. Under *Alsea Valley*, NOAA Fisheries is *only* required to eliminate the problem of subdividing distinct population segments for listing determinations. *Alsea Valley* does not require NOAA Fisheries to conclude that hatchery fish improve the status of the ESU or that hatchery fish contribute to the recovery of wild fish. Under *Alsea Valley*, NOAA Fisheries still retains the discretion to determine how it will implement the ESA, so long as it does not subdivide distinct population segments in listing decisions. Under *Alsea Valley*, NOAA Fisheries might accomplish the goal of protecting wild salmon and steelhead through a variety of avenues. It might revise its ESU Policy, or exclude hatchery fish from current ESUs, or list hatchery fish. Regardless of which

policy it pursues, nothing in *Alsea Valley* requires NOAA Fisheries to claim, contrary to the science, that hatchery fish benefit wild populations or contribute to their recovery.

Statements by Judge Hogan in *Alsea Valley* regarding genetic similarities between hatchery and wild fish, and the possibility of splitting the ESU, are dicta and do not bind NOAA Fisheries. Not only are these statements dicta, but they were also not supported by the administrative record. For example, in dicta, the district court opined that NMFS had no choice but to include the hatchery populations in the ESU considered for listing because "'hatchery spawned' and 'naturally spawned' coho within the Oregon coast ESU share the same rivers, habitat and seasonal runs." In the court's view, hatchery and wild salmon are necessarily the same species. 161 F. Supp.2d at 1162-63. The court cited the plaintiffs' concise statement of material facts (ER 76) for these propositions, but that statement relied on extra-record evidence that the district court ordered stricken from the record. ER 105. In the order striking the extra-record evidence, the district court held that review is limited to the administrative record and struck the extra-record evidence submitted by the Alliance because it "is replete with expert opinion and argument that falls outside the record." ER 105:636. Thus, the court erred in relying on stricken extra-record evidence in its opinion.

NOAA Fisheries should acknowledge that it is making a major policy change on its own initiative; that while it may have been spurred on by *Alsea Valley*, NOAA Fisheries itself has decided to go far beyond what was required of it by *Alsea Valley*. Furthermore, NOAA Fisheries was not required to accept the legal analysis in *Alsea Valley* and to apply it to all ESUs. NOAA Fisheries could have appealed the *Alsea Valley* decision; however, it chose not to. Because NOAA Fisheries failed to defend their own policy, environmental groups were forced to intervene to appeal the decision. However, the Ninth Circuit held that it did not yet have jurisdiction to decide the merits of the appeal; instead the appellants would need to await the outcome of the remand, specifically the listing determinations. Therefore, the judge's interpretation in *Alsea Valley* has not been tested on appeal.

Further, NOAA Fisheries should be clear about what *Alsea Valley* required. NOAA Fisheries claims that "NMFS must base its listing determinations for Pacific salmon and steelhead on the risk of extinction of the entire ESU, including both natural and hatchery fish." 69 Fed. Reg. at 31,357. It is true that, under *Alsea Valley*, NOAA Fisheries must evaluate the entire ESU. However, NOAA Fisheries should make clear that *Alsea Valley* does not require that the ESU must be composed of both natural and hatchery fish. The ESA does not define a distinct population segment, other than referring to it as including fish, wildlife, or plants "which interbreed[] when mature." 16 U.S.C. § 1532(16). Further, a distinct population segment is not a term that has a singular and commonly accepted scientific definition. Therefore, NOAA Fisheries has the discretion to define what constitutes a distinct population segment, provided it does not adopt an arbitrary and capricious definition or one that fails to apply the best available science. NOAA Fisheries chose to define a group of wild populations plus some hatchery populations derived from any of them as comprising a single ESU; this definition is not required by the ESA.

2) *The Endangered Species Act*

Crafters of the ESA intended the Act to protect wild populations in their native habitats, not organisms propagated by humans in artificial habitats. As the Federal Register points out, the purpose of the ESA is "to provide a means whereby the ecosystems upon which endangered species and threatened species [depend] (sic) may be conserved." 68 Fed. Reg. at 31,357 (quoting 16 U.S.C. § 1531(b)). The language demonstrates that natural ecosystems must be conserved. If Congress believed or intended that humans could create alternate artificial habitats instead of protecting natural habitats, then the above language would have been unnecessary. In fact, NOAA Fisheries acknowledged the ESA's focus on wild fish in its original hatchery policy. 58 Fed. Reg. 17,753 (April 5, 1993). According to that hatchery policy,

[t]he ESA . . . mandates the restoration of threatened and endangered species in their natural habitats to a level at which they can sustain themselves without further legal protection. For Pacific salmon (*Oncorhynchus*), the ESA's focus is, therefore on natural populations-the progeny of naturally spawning fish-and the ecosystems upon which they depend.

58 Fed. Reg. At 17,573. Nothing in *Alsea Valley* changes this statement. The ESA's mandate and focus remain natural populations.

Furthermore, as explained in the notice, NOAA Fisheries must determine that incidental take permits under section 10(a)(1)(B) "will not appreciably reduce the likelihood of the survival and recovery of the species *in the wild*." 69 Fed. Reg. at 31,357 (emphasis added) (quoting 16 U.S.C. § 1539(a)(1)(B)). This language makes it clear that the ESA is intended to protect wild species. NOAA Fisheries would not accomplish the goal of protecting species in the wild if it allowed hatchery fish to serve as a substitute for wild fish. NOAA Fisheries might claim that under its policy, hatchery fish do not substitute for wild fish because a few (nonviable) wild populations will remain; however, nothing in the ESA language suggests that would be an appropriate justification for failing to list or delisting the wild fish.

The goal of the ESA is to recover populations to the point that they are self-sustaining in the long term. *See* 16 U.S.C. § 1531(b); 1532 (3) (stating the purpose of conserving listed species and defining conservation). Hatchery fish do not contribute to the sustainability of salmon and steelhead populations, in part because they require continual and costly human intervention. If NOAA Fisheries determined that wild populations had reached such precipitously low numbers that naturally unsustainable artificial propagation could benefit these populations, then clearly the wild fish would require listing because they would by definition not be self-sustaining. It would be illogical to conclude both that wild populations are so threatened that artificial propagation is necessary and that wild populations are so healthy (because of hatchery fish) that they need not be listed. Therefore, hatcheries must not be considered in listing determinations, except as a threat to wild populations.

NOAA Fisheries claims that "the ESA does not preclude NMFS from giving special recognition to naturally spawned fish as a measure of the sustainability of the natural ecosystem." 69 Fed. at Reg. 31,357. However, the language of the ESA is in fact much stronger than that. The ESA *requires* special recognition for naturally spawned fish, as those are precisely the fish that the ESA intends to protect.

Furthermore, it is inconsistent with the ESA to proceed with a policy with so little scientific support because it defies the precautionary principle. The Endangered Species Act requires federal agencies to give species the benefit of the doubt. *Conner v. Burford*, 848 F.2d 1441, 1454 (9th Cir. 1998), H.R. Conf. Rep. No. 96-697, *reprinted in* 1979 U.S.C.C.A.N. 2572, 2576. This means that when NOAA Fisheries is faced with uncertainty regarding hatchery impacts, it must err on the side of caution and pursue the approach that is mostly likely to ensure the protection of the species (i.e. as it is represented by naturally-spawned fish occurring in the wild). *See TVA v. Hill*, 437 U.S. 153, 178 (1978) ("Sheer self-interest impels us to be cautious. The institutionalization of that caution lies at the heart of [the ESA bill].") (quoting H.R. Rep. No. 93-412, 5 (1973)). The current state of the science is that we know hatcheries cause harm to wild populations. NOAA Fisheries asserts that hatcheries offer "potential" contributions. In other words, the value of hatcheries lie only in their potential, uncertain benefit. Given the uncertainty surrounding their possible benefits, it is premature to propose a policy that claims hatcheries might reduce the need for listing of wild salmonid populations. If, in the future, the science can demonstrate that hatcheries help conserve and recover salmonids, then that might be the time to propose a policy to consider the contribution of hatcheries to the health of salmonid populations. As NOAA Fisheries' own scientist Robin Waples has explained, "[f]irst do no harm.' . . . [S]upplementation should be considered only if there is adequate assurance that it will not make the problem worse." (Waples 1991)

The Federal Register states "[c]ontinued scientific work is necessary to identify and to measure the[] risks and benefits" of hatcheries. 69 Fed. Reg. at 31,356. Wild Pacific salmon and steelhead are facing extinction already. It is inconsistent with the ESA to propose a policy that may further harm the status of salmon and steelhead on the grounds that later science may prove that the policy does not hinder conservation and recovery. It is inconsistent with the law to allow the inclusion of domesticated hatchery stocks, whose viability in the wild is uncertain and questionable, to obscure the status determination of wild, naturally-occurring populations or distinct population segments of salmon. Many populations of Pacific salmon and steelhead are already threatened with extinction; they cannot afford the possibility that hatcheries will aggravate threats to their viability. The Pacific salmon and steelhead deserve the benefit of the doubt.

The Federal Register notice suggests that the ESA somehow requires the consideration of hatchery fish as measure to protect wild fish. The basic language of section 4(b) demonstrates that the ESA does not conclude that hatchery fish contribute to the recovery of wild salmonid populations. As the federal register explains:

Section 4(b) of the ESA requires the Secretary to make listing determinations after . . . taking into account those efforts, if any, being made to protect the species. 16 U.S.C. 1533(b)(1)(A). Such efforts being made to protect the species include 'conservation' practices, defined by the ESA as 'all method and procedures which are *necessary* to bring any endangered species or any threatened species to the point at which' the protections of the act are no longer necessary.' 16 U.S. C. 1532(3). The methods and procedures of conservation include 'propagation' and 'transplantation.'

69 Fed. Reg. at 31,357 (emphasis added). Under this language, hatcheries are not "conservation" practices because they are not *necessary* to recover wild salmonid populations. A practice that contributes to the decline of wild salmonid populations simply cannot be necessary to recover wild salmonid populations. If anything, what is necessary to recover wild salmonid populations is to eliminate or lessen the factors contributing to their decline. These factors include hatcheries.

NOAA Fisheries is required to consider hatcheries when it lists populations because it must consider the best available science. Because the science demonstrates that hatcheries contribute to the decline of wild salmonid populations, NOAA Fisheries must consider this threat when deciding whether to extend ESA protection. However, nothing in the ESA requires NOAA Fisheries to determine that artificial propagation of salmonid populations is a method to protect and conserve these populations if the best available science does not substantiate this conclusion.

NOAA Fisheries' use of 4(d) rules to allow harvest of hatchery fish

NOAA Fisheries' proposal in the hatchery policy to use 4(d) rules to allow harvest of hatchery fish is problematic because it leaves NOAA Fisheries too much discretion to mismanage hatchery fish, which pose a threat to wild threatened populations, after the hatchery fish are listed. The hatchery policy provides no clear standards regarding how NOAA Fisheries will determine that hatcheries are being managed in a way that provides for the "conservation and recovery" of the ESU. Nothing in the policy assures that poorly managed hatchery fish will not be protected under the ESA.

NOAA Fisheries is implementing this portion of the hatchery policy through the proposed 4(d) rule described in the listing determination proposal. 69 Fed. Reg. 33102 (June 14, 2004). The Federal Register explains that "NMFS proposes to apply section 4(d) protections to unmarked anadromous fish with an intact adipose fin . . . Hatchery fish that are surplus to the recovery needs of an ESU . . . may be exempted from the section 4(d) protections." *Id.* at 33167. This rule implementing point 5 of the hatchery policy fails to address the particular purported benefits of each hatchery. Instead, it leaves NOAA Fisheries discretion to determine at a later date the impacts of each hatchery, whether the hatchery fish are somehow contributing to the recovery of an ESU, and whether the agency should allow take of hatchery fish. The proposed 4(d) approach, as set out in the proposed hatchery policy and proposed listing determinations, creates a backward system for dealing with hatchery fish because under this system, NOAA Fisheries extends hatchery fish the protections of the ESA, even if these fish are in fact threatening the

viability of the ESU. The determination whether these hatchery fish are limiting recovery of the ESU, and thus should be exempted from the take prohibition, is left to some unspecified later time. Furthermore, an unidentified process, and unidentified hatchery management standards, will be used to make this determination. This process therefore potentially leads to the undesirable outcome of protecting the very same hatchery fish that are contributing to the decline of wild populations.

The presence of hatchery fish should never be used to substantiate any claim that wild fish should be delisted.

NOAA Fisheries' Federal Register notice states that "the manner in which the hatchery populations associated with an ESU are considered in making a determination whether the ESU should be listed can affect the outcome of that determination." 69 Fed. Reg. at 31,356. PRC reiterates that NOAA Fisheries should not adopt any policy that allows hatchery fish to affect the outcome of a listing determination, except in the conclusion that hatchery fish pose a threat to the viability of wild salmonid populations. NOAA Fisheries should develop a policy which clearly states that the presence or abundance of hatchery fish *will not* be used to delist wild fish.

Instead of making such a clear statement, the hatchery policy fails to set clear standards, leaving NOAA Fisheries with virtually unbounded discretion when implementing the policy. Regardless whether NOAA Fisheries might currently have good intentions regarding recovering wild populations, key elements of the policy are so poorly conceived and articulated that they can easily be abused or manipulated. Equally important, these standards offer an unjustified and probably erroneous hope that certain limited genetic or other biological criteria will offer a magic formula to resolve all risk and uncertainty surrounding hatchery fish and their impact on wild fish.

For example, the "moderate divergence" standard is not a strict, clear, measurable and replicable standard, nor is it well-reasoned in view of the available scientific information. First, there is no feasible or accepted standard means of measuring effective divergence of those genetic factors that most strongly influence survival. Existing genetic indicators are based on "neutral markers" or alleles that are not correlated with the more rapidly-evolving traits that determine fitness. It is these fitness traits, not neutral markers, that effectively determine the survival and interactions of hatchery fish after release and commingling with wild populations. Second, there is little in the literature that would establish a "safe" or "effective" minimum level of divergence of adaptive traits, and little that would tell you how these can be measured except through empirical experiments, such as have been conducted in laboratories with fruit flies. Third, genetic divergence, no matter how it is measured, may have little or no influence on many of the risks posed by hatchery fish, such as disease transfer and behavioral disruption of social systems in wild populations. These risks and harms caused by hatchery fish can be independent of their actual or apparent divergence from wild populations. Finally, it is clear that the more the fitness and survival of hatchery fish are increased, presumably a direct measure of their effective divergence from wild populations, the more strongly hatchery fish displace wild fish from natural habitat where habitat is limiting (Oosterhout and Huntington 2003). In other words,

density-dependent harms may be intensified by increased fitness and survival (i.e., moderate or low diverge) among hatchery fish in the ecosystem.

In addition, statements to the effect that NOAA Fisheries recognizes the value of wild fish and their habitats are toothless. Under this policy, no standards ensure that policy implementers will not make a political decision to delist an ESU by pushing the limits of the policy. In short, the proposed policy does not properly proscribe administrative action in a way that will safeguard wild populations and ensure that salmon are conserved in the wild, and in so doing it allows or encourages decisions that risk serious harm and jeopardy to salmon recovery. These shortcomings are not just inconsistent with, but fly in the face of best available scientific information. The proposed policy attempts to legitimate the inclusion of hatchery fish in status determinations in ways that could or would preclude the listing and federal protection of salmon that are in fact threatened and endangered in the wild.

The economic and ecological costs of reliance upon hatcheries and the decimation of wild populations¹

If NOAA Fisheries desires to recover wild populations of salmonids, and it has money to contribute to that end, that money would be best spent on programs for which there is evidence that the programs will provide long-term benefits. Specifically, the evidence demonstrates that habitat restoration is the best method to recover wild populations. Hatcheries are only proven to be costly. Both scientifically and economically, it makes the most sense to invest limited resources into habitat restoration. Furthermore, if agencies put money into habitat restoration, the resulting improvement in species' status would address social concerns about commercial and recreational fisheries. Restoration is good for the taxpayers, and it is ecologically sound. Hatcheries are neither good for the taxpayers, nor ecologically sound.

Furthermore, both science and economics support the conclusion that wild salmon and steelhead populations must be protected from the adverse effects of hatcheries. Losing these wild populations would bring devastating ecological and economic costs. The loss of these populations would be an incredible blow to both commercial and recreational fisheries. If hatchery fish are expected or allowed to substitute for wild populations, local adaptations and genetic diversity will be lost forever. There is a high likelihood that many hatchery stocks cannot be successfully repatriated to reestablish wild runs, and even where this is feasible, it is highly likely that lack of local adaptation in such reestablished populations will render them of lower productivity and abundance relative to the wild runs they replaced. We simply cannot afford to lose the salmonid populations that are a symbol of the Northwest. The people of the Northwest have repeatedly demonstrated that they value wild salmonids. NOAA Fisheries must develop strong policies to ensure that wild salmonids are protected.

¹ PRC does not intend, by any means, to imply that economics should be considered in listing determinations. In fact, under section 4(b) of the ESA, listing determinations must be made "solely on the basis of the best scientific and commercial data available." 16 U.S.C. § 1533(b).

Conclusion

NOAA Fisheries states that "[i]n the past, NMFS focused on whether the naturally spawning fish are, by themselves, self-sustaining in their natural ecosystem over the long term." *Id.* PRC asserts that NOAA Fisheries must continue this focus on naturally spawning fish and natural ecosystems. Neither the science nor recent clarification of the law justifies any change from this focus. We request that NOAA Fisheries develop a clear, cogent, science-based policy that is consistent with this ESA-required focus.

Sincerely,

Bronwen Wright
Conservation Associate
On behalf of Pacific Rivers Council

REFERENCES

Statutes:

The Endangered Species Act, 16 U.S.C. § 1531-1544.

Congressional Reports:

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Federal Register Notices:

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60 Fed. Reg. 37,011 (July 25, 1995)

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