



Pacific Rivers Council PO Box 10798 Eugene, OR 97440 ph 541.345.0119 fax 541.345.0710
--

October 16, 2006

Elizabeth Babcock
National Marine Fisheries Service, Salmon Recovery Division
7600 Sandpoint Way N.E. Seattle, WA 98115
HCsalmonplan@noaa.gov

RE: Comments on Hood Canal Salmon Plan

Dear Ms. Babcock:

Please accept and enter into the record on behalf of the Pacific Rivers Council (“PRC”) the comments contained in this letter and in the attached review of the proposed Hood Canal chum salmon recovery plan, as requested in the Federal Register Notice of August 16, 2006 (Fed. Reg. 71(158): 47180-47184).

PRC is a non-profit conservation organization dedicated to the development and implementation of science-based public policies that protect and restore aquatic ecosystems and the species that depend on them. PRC is incorporated and has its headquarters in the State of Oregon. In 1993, PRC led an environmental coalition to petition for federal protection under the ESA of Pacific coho salmon in Oregon, Washington, Northern California, and Idaho. PRC has over 750 members throughout the United States and Canada. PRC members participate in recreational activities, such as hiking, backpacking, cross-country skiing, nature photography, and river and lake boating throughout the Pacific Northwest, and, where possible, observe and benefit from wild salmon and steelhead.

The attached review employed a conservation/recovery planning and review template developed by PRC science staff (Frissell and Carnex, in prep) from extensive review of conservation/recovery planning literature and assessments. The intent of this template was use as a tool that would be generally relevant across taxa and conservation/recovery plan types (e.g., recovery plans, Habitat Conservation Plans, etc.). It is intended more to address the overall question of scientifically credible completeness (i.e., “covering all the bases”) than exhaustive examination of adequacy of particular plan elements in detail, although it still lends itself reasonably well to assessments of adequacy, and many of our review comments address this. Though intended to be generally applicable, the template was first developed for use assessing recovery/conservation plans for imperiled inland native trout subspecies, and successfully employed by an expert science panel for that purpose. PRC staff and independent scientists have subsequently employed it with minor

revision for plans targeting amphibian species and now for several Pacific salmon plans.

PRC is a plaintiff in litigation of NMFS' Hatchery Listing Policy, and issues underlying that litigation inform our comments. These are addressed in some detail in the attached review, and thus only briefly generalized and reiterated here. Essentially, PRC asserts that NMFS erred in its interpretation of the Alsea decision (Alsea Valley Alliance v. Evans), as subsequently applied in the Hatchery Listing Policy. The Alsea court essentially ruled that **if** NMFS defined an ESU to include hatchery fish, then it had to base listing and recovery decisions on all of the defined ESU, including hatchery fish. It did not, however, compel inclusion of hatchery fish in defined ESUs. PRC asserts that the appropriate approach under both the Alsea decision and ESA's explicit direction to "to provide a program for the conservation of ... endangered species and threatened species" and "to **provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved**" is to exclude hatchery fish entirely from listing and status determinations and focus recovery efforts on wild populations and the ecosystems on which they depend. The clear intent of ESA is to recover indigenous populations within their ecosystems, not technology-dependent hatchery populations or hatchery-wild mongrel populations, which must be regarded by default as threats to wild salmon recovery. While ESA does provide for artificial propagation/captive breeding interventions, these are clearly intended as truly last-ditch, last-resort emergency measures against impending extinction, not as widely-employed substitutes for the ecosystem conservation explicitly called for in the Act, nor to mask ongoing declines of wild salmon and habitat, in which past and ongoing hatchery releases are often implicated. Hatchery interventions to supplement extant wild populations that have managed to persist (as ongoing and proposed in the Hood Canal summer chum plan) are especially problematic in this regard, as this creates the situation in which native genetic and life-history diversity and local adaptation are most directly threatened by hatchery releases.

Two additional comments relate to NMFS notice seeking comment more than to the recovery plan itself (and NFMS Supplement). First, NMFS states that

the HCCC is developing a more detailed monitoring and adaptive management plan to be in place by December 2006 as part of the overall implementation program. NMFS believes the adaptive management and monitoring element of the Plan is adequate. [Fed. Reg. 71(158): 47183]

This statement seems frankly absurd. Given that the "more detailed monitoring and adaptive management plan" is still in development, i.e., does not yet exist, is "adequate"?

Finally, we emphasize the crucial importance to any scientific credibility that the 5-year reviews and 10-year-limited term of NMFS' endorsement of this plan are adhered to, along with adaptive management and implementation referenced above and in our detailed attached review.

Sincerely,

Gary Carnefix
Research Associate
Pacific Rivers Council
gcarnefix@aol.com
406-883-1503 (office)
406-883-1504 (fax)
PMB 219, 61529 Highway 93, Suite A
Polson, MT 59860

Hood Canal summer chum –

Plan consists of the Hood Canal & Eastern Strait of Juan de Fuca Summer Chum Salmon Recovery Plan (Version November 15, 2005) by the Hood Canal Coordinating Council (HCCC SRP) and the NMFS Supplement (August 1, 2006). Supplementary NMFS technical documents were not available at the time of this review.

I. Overarching scientific criteria

This plan does a very good job of referencing key source data, theoretical principles, and analyses or analytic methods and justifying assumptions based on expert opinion. A lot of new science (e.g., Ruckelshaus report) developed around this plan was not available, however, so uncertainty remains for some technical questions. Primary and other major threats to the species are very clearly identified and appropriately addressed by planned conservation measures with the exception, in our view, of hatcheries. While hatcheries are clearly acknowledged as a threat, we suggest that the role of hatcheries in past declines/extirpations and current depressed status is probably underestimated, while their potential for assisting recovery of wild chum populations is probably greatly overestimated, especially in regard to proposed supplementation measures.¹ Over-reliance on artificial intervention such as hatchery supplementation coupled with under-reliance on addressing root causes of declines/extirpation such as habitat degradation seems to underlie and pervade the plan. This appears to reflect grounding of the plan on two grand, but questionable assumptions, i.e., that 1) stock transfers/reintroductions can be done without biological limitations and 2) hatcheries can overcome limitations in habitat. The ongoing hatchery supplementation program appears to have so much momentum and be so entrenched that these premises are never adequately scrutinized.

The plan identifies 3 issues (harvest, hatcheries, and land use) relevant to evaluation of regulatory protections which will remain after delisting ("background law", sensu Doremus & Pagel 2002), and future actions are proposed to track land use throughout the ESU (a system to 'normalize' data across jurisdictions); the plan concedes that it will not tackle larger issues (e.g., forest practices). It also proposes "to explore the

¹ See, e.g.,

Oosterhout, G.R., C.W. Huntington, T.E. Nickelson and P.W. Lawson. 2005. Potential benefits of a conservation hatchery program for supplementing Oregon coast coho salmon (*Oncorhynchus kisutch*) populations: a stochastic model investigation. *Can. J. Fish Aquat. Sci.* 62:1920-1935.

“ . . . perhaps the most important observation to be derived from this study is that hatcheries do not produce fish that are identical to wild fish, even in a program designed to minimize the differences between the two production types.”
Knudsen, Curtis.M., Steve L. Schroder, Mark V. Johnston, Todd N. Pearsons, William J. Bosch and David E. Fast. 2006. Comparison of life history traits between first-generation hatchery and wild upper Yakima River spring Chinook salmon. *Transactions of the American Fisheries Society* 135:1130–1144.

Kostow, Kathryn E., and Shijie Zhou. 2006. The Effect of an Introduced Summer Steelhead Hatchery Stock on the Productivity of a Wild Winter Steelhead Population *Transactions of the American Fisheries Society* 135:825–841.

Araki, Hitoshi, William R. Ardren, Erik Olsen, Becky Cooper, and Michael S. Blouin. 2006. Reproductive Success of Captive-Bred Steelhead Trout in the Wild: Evaluation of Three Hatchery Programs in the Hood River. *Conservation Biology* (early online publication).

further development of EDT [Ecosystem Diagnostic and Treatment (Lestelle et al 2005)] as . . . a tool to address programmatic actions relative to summer chum salmon habitat and eventual recovery of the species." It is not clear, however, that this will be sufficient to ensure against a recurrence of the threats that led to listing.

Scientifically defensible and explicit linkage of listing decisions, planning, mitigation and very specific recovery goals/delisting criteria to species ecology (including geographic and genetic population structure) is included to an impressive level of detail, presumably due to the plan's discrete, limited geographic scope and single-species focus. Adopts "Co-manager (WDFW and PNPTT) Interim Summer Chum Salmon Recovery Goals" (described as "interim natural-origin-recruit recovery goals for abundance, escapement, productivity and diversity") in lieu of not-yet-available "identification of two independent summer chum salmon populations that comprise the ESU with an associated viability analysis" from NMFS' TRT, with disclaimer that they are 'not viability goals similar to those developed for Puget Sound chinook by the PSTRT (2002). They are "tangible targets against which the success of recovery measures can be measured" (PNPTT and WDFW 2003). . . . [E]xpectation that they may be revised as additional information is generated' is explicit (pp. 14-16). Recovery criteria seem at least "ballpark" reasonable relative to criteria in recovery plans of other comparable listed species. However, no adequate and valid ecosystem assessment was evident that links species- and site-specific recovery or restoration measures to ecosystem organization and processes, and evaluates the likely success of recovery measures in this context. The plan establishes metrics of land use pattern and practice and for watershed condition that correspond with maintenance or recovery of habitat condition sufficient for local persistence and regional recovery of the species, but does not establish criteria for water use and management, and for surface and subsurface water flow conditions, that are sufficient to conserve and restore the species, although it makes recommendations to municipalities, etc. about adopting better water use and management. The plan addresses human development and demographic trends (as noted, proposes standardization of data to inform growth/development policies/regulation across jurisdictions) and climatic variability or trends, but NMFS dismisses the global warming/ocean condition issue as too speculative. There are some provisions or allowances to increase its robustness to foreseeable environmental and human variation, trends, and catastrophes, but this is largely deferred to a forthcoming Adaptive Management Strategy.

II. Habitat criteria

ESA critical habitat is designated and consists of only "occupied" lower portions of streams and nearshore marine areas, minus some political/economic exclusions, plus, interestingly, the only "unoccupied" habitat included in the NMFS Final Rule for 12 west coast salmon/steelhead ESUs (Fed. Reg. 70 (170): 52635, 52658):

. . . the three areas designated for Hood Canal summer-run chum. In this case, we were able to determine that these specific areas are essential for conservation because summer-run chum have such a restricted geographic area, there is a local recovery plan that has been in place for several years, and conservation hatchery fish are currently being released in these areas in an effort the recovery plan finds is essential

for conservation of this ESU. We received no comments specifically questioning our findings that these unoccupied areas proposed for designation are essential for conservation.

This plan very specifically identifies and prioritizes needed habitat (e.g., priority, primary and secondary refugia). Not clear how closely it coincides with ESA-designated critical habitat. Some refugia are identified and identification of more is planned. Level of actual protection in refugia is unclear; existing regulations, seemingly. Efforts are ongoing in some Conservation Units (CUs) to purchase some refugia habitat, but no evidence presented of sufficiency for recovery. We could not readily determine from plan documents whether the reserve network (“refugia”) includes patches of sufficiently large size to support local populations of the subspecies. The stated goal is to recover all historic stocks (half, i.e., 8 of which were extirpated), but it’s unclear if/how this is linked to protected habitat, thus whether protected habitat is well dispersed through the historic (and present) range of the species, internally fragmented or relatively unfragmented and protected in terms of maintaining natural biophysical processes internally (e.g., whole watersheds). Dispersal is recognized as critical to recovery, but plan attempts to address this through hatchery supplementation/reintroduction, rather than reserve design that accommodates it.

Specific variables to describe habitat condition are identified in generic terms, e.g., “habitat conditions (as indicated by fish habitat parameters such as pools and large woody debris) or watershed indicators (such as total impervious area, forest cover, wetland loss, and status of benthic invertebrates) may be unconstrained (functioning) or constrained (impaired or degraded)” (HCCC SRP, p. 32). Beyond these general refugia and functioning ratings, threshold criteria or conditions are not specified (or specifications are not readily apparent in these documents) for 1) suitable and 2) high-quality habitat, but description of monitoring program implies they may be specified in referenced protocols, e.g., SFRB and TFW (HCCC SRP, pp. 284-5). Some suspicion that prioritization and focus on lower portions of rivers, “where spawning and rearing tend to occur, and the estuarine areas” may be driven as much or more by political and feasibility considerations more than scientific justification, e.g., “[a]ctions in the upstream areas of the watersheds will require assessments to determine impacts and limiting factors that contribute to degradation in the lower reaches.” (HCCC RSP 154) Habitat actions, in order of priority = (1) protect, (2) restore (emphasis on passive restoration), (3) rehabilitate (emphasis on active restoration), (4) substitute, (5) maintain status quo. See HCC Plan 25 –29. Methods are identified and scientific justification provided for the selection of habitat variables and their methods of measurement and for measurement and monitoring of habitat conditions relative to identified biological thresholds, and there is provision in the plan for testing of any assumptions that “improvement” in monitored habitat variables equates to improvement in species status. However, “[d]ue to a lack of adequate understanding of how habitat affects potential stock production, productivity, and diversity, habitat is not linked directly to the interim recovery goals.” (HCCC RSP, p. 14) Specific recommended management practices/actions are described in great detail and seem generally appropriate (except previously noted reservation regarding over-reliance on hatchery interventions). Especially given explicitly voluntary nature of overall plan as well as specific recommendations, however, they are not clearly sufficient

to maintain and restore target populations and their habitats (i.e., the “refugia” are not true reserves, with protection and restoration of the target species the determining factor in their management).

III. Artificial culture and release practices

History and reasons for success and failure of past (and ongoing) artificial culture and translocation practices related to this species are discussed at considerable length. The plan cites favorable reviews and seals of approval from NMFS’ Biological Opinion and the Hatchery Scientific Review Group, but then pleads poverty regarding implementation of HSRG’s comments/recommendations on which its approval is conditional, i.e., “[c]ontinue the existing program . . . **including collecting and analyzing all data necessary to evaluate the program’s success . . . Ensuring complete monitoring and evaluation of this program will be crucial to meeting the second and third principles— scientific defensibility and informed decision-making.** Like all integrated hatchery programs, **success will depend on good habitat being available to both the hatchery, and natural-origin, components of the integrated population.**” (HCCC RSP, pp. 64-5, emphasis added) No such poverty plea is offered regarding continuation of the supplementation program, however. The hypothesis that status of wild populations might be significantly better in the absence of hatchery supplementation does not appear to have received serious consideration, and the difficulty created by hatchery supplementation of even assessing this possibility is glossed-over, if not ignored completely. Nevertheless, the plan relies heavily on technological interventions including artificial culture and release of artificially-propagated or -reared individuals and artificial translocation as a central feature. The plan assumes that possible consequences of artificial culture and translocation practices on genetic diversity, local adaptation and fitness are adequately accounted for and minimized (including hatchery/wild interactions and impacts of non-conservation stocking of target or other taxa, e.g., for sport/commercial harvest), that cultured or translocated stocks constitute a sufficiently representative slice of the extant genetic diversity and heritage of the species, that donor populations for artificial culture or translocation activities are not placed at risk by the taking of individuals for these interventions, and that the potential for artificial culture and release practices to provide a vector of pathogens to populations in the wild (target or non-target species) is minimized and acceptable, but none of this is documented (perhaps there are attempts to do so in referenced preceding/underlying documents?). The plan appears to assume that a 12-year limit on supplementation will prevent or sufficiently minimize all these potential impacts, but arbitrarily resets the starting clock on one supplementation program from 1992, when it began (and then continued without “success” for several years) to 1998, when adult returns finally started to show increases. Given how heavily the plan relies on such interventions, thorough and credible assessment of these issues by NMFS is crucial, but appears to be dodged in its supplement. We suggest serious reconsideration is needed whether priorities in which hatchery interventions appear reliably funded and entrenched, while adequate monitoring of their impacts and clear habitat protection and restoration needs go begging, are not in fact the reverse of what makes the most ecological and economic sense.

IV. Species interactions and nontarget species concerns

The plan states it will benefit two other listed fish (chinook & bull trout), but potential for adverse effects from plan activities on non-target species is not addressed. Present and future risks and time trends posed by co-occurring non-native or invasive species (including pathogens), security of existing habitat free of non-native species from future invasions (where they are a threat), and potential for possible unintended benefits to non-native or invasive species from habitat, harvest, or other management interventions are not addressed, nor is design of actions to minimize the possibility of adverse side effects evident. The prey base of the species is identified and restoration of food resources recognized as a high priority and intricately linked to habitat restoration (e.g., “Within the estuarine-marine environment, the most important factor for restoration is food, associated with loss of eelgrass, shoreline development, and loss of riparian corridors”). Some specific actions targeting these restoration needs are identified by watershed. Natural or introduced predators on the species are identified and their ecological relationship with the target species addressed sufficiently to ensure that recovery or restoration measures are not countervailed by predation.

V. Harvest management (targeted and incidental)

The plan accounts for the biological impact of historical and present day levels of human harvest, legal, illegal, and incidental. Harvest restrictions are in place and harvest impacts are discussed, but not clearly justified in terms of the ability of the populations to sustain this mortality source. NMFS endorse HCCC’s commercial harvestability goals, but says it’s only legally bound to consider recovery at ESU level. (Does viability include tribal harvest rights?)

VI. Demographic and genetic data

Status and trend data available for key populations are reported and interpreted in the plan. Biology of all life stages is discussed and reasonable justification is provided for the choice of conservation measures relative to the life cycle and mortality sources and magnitudes of each life stage. Life history and behavioral diversity within key life stages and populations are addressed, and the plan attempts to ensure that existing or critical natural life history and behavioral diversity are maintained or restored, and not compromised, although hatchery supplementation threats to such diversity appear under-recognized.

As noted (see I. Overarching scientific criteria), interim recovery goals adopted pending NMFS’ TRT’s not-yet-completed viability analyses assume adequacy for short and long-term viability. NMFS’ supplement appears to endorse these as adequate at the ESU level, but HCCC came up with viability plan at the population level. However, extinction risk discussion in HCCC SRP is limited to “not high risk because of successful hatchery supplementation” conclusory remarks, and is missing from NMFS supplement, which appears to be a major failure of duty on NMFS’ part. NMFS says (without viability/extinction risk analysis) at ESU level the plan is good enough for recovery but at

population levels, harvest regulations and spawning rates are not good enough to restore individual populations; i.e., under any scenario (current/future) individual subpopulations may not meet viability definition, but ESU as a whole will meet the definitions of viability and recovery. Suggests perhaps tribal level harvest not included in ESU viability analysis?

Importance of cumulative effects is consistently recognized and repeatedly mentioned in various contexts throughout the plan, e.g.:

The reduction of stream and estuarine productivity and capacity, caused by habitat degradation, is cumulative with the negative effects of climate and excessive fishery exploitation. The affects of habitat degradation likely contributed to the decline in productivity, in systems with summer chum impacted by the regime shifts in 1976 and 1986 (WDFW and PNPTT 2000). (HCCC SRP, p. 49)

Climate shifts like those observed in the past 30 years, with their associated stream flow changes, likely have posed little threat to summer chum populations before the cumulative effects of habitat changes from human development became manifest. (HCCC SRP, p. 72)

However, cumulative effects are never incorporated into extinction risk/viability analysis (perhaps will be in TRT's forthcoming analyses mentioned?). As noted in hatchery discussion, risks and status of hybridization and introgression to justify the conservation rules appears inadequately analyzed (which is in fact made more difficult, perhaps impossible, by past and ongoing supplementation). Assumes risks not significant and/or that "conservation" hatchery "reform" measures/restrictions and 12-year duration limit on supplementation will adequately mitigate any such risk.

VII. Critical uncertainties

A reasonable effort has been made to identify critical uncertainties and assumptions, and the plan attempts to accommodate at least some of these uncertainties through conservative assumptions or through factors of safety that are biologically robust to error (e.g., NMFS puts strict time limitations on the life of the plan – 10 years, subject to renewal – and proposes 5 year reviews in acknowledgment of uncertainty) and through adaptive management. A reasonable generalized framework identifying monitoring needs (in fair detail) and sketching out an adaptive management decision process is described, but details necessary to assess the plan's adequacy (such as specification of adaptive management triggers for particular monitored elements and what management changes they would trigger) are lacking (presumably, deferred to release of an adaptive management component scheduled for December release). Some specific uncertainties do not seem adequately addressed, e.g., climate change (HCCC attempts to address, NMFS seems to back off from this attempt) and as noted, uncertainties associated with hatchery interventions.

VIII. Implementation and adaptive management issues

The plan is explicitly voluntary (“action alternatives will be driven by political feasibility, opportunity, ability, and willingness”), but states that parties have been voluntarily working together for 20 years, and so have a level of commitment (however, Chris says the coordination is not true if you ask anglers and tribes). The HCCC Plan explicitly identifies fiscal & personnel resource needs and existing & future funding sources, and proposes a fundraising strategy. NMFS Supplement inserts standard disclaimer – recovery plans are recommendations but nothing should be construed as financial or staff commitment or obligation. The whole plan is subject to funding and political will. There is reasonably clear delineation of responsibilities of cooperators, and implementation and biological effectiveness monitoring frameworks are described, but with many details still to be revealed in the forthcoming adaptive management plan. Therefore it remains unclear whether sufficient monitoring is planned to evaluate the overall population trend and recovery of the species, or to trigger any necessary adaptive management adjustments in sufficiently timely fashion. Unless it appears in the adaptive management plan when eventually released, there is no provision for an emergency management response to natural or large-scale human-caused catastrophe that changes the assumptions on which the plan is based. Potential catastrophes are mentioned (appropriately) only in the context of the goal of maintaining/restoring behavioral, life history and habitat diversity for the resistance/resilience to catastrophe that they confer.