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Review of the Revised Hood River Production Program Master Plan



Step One of the Northwest Power and Conservation Council's
Three-Step Review Process

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ISRP Review of the Revised Hood River Production Program Master Plan

Background

At the Northwest Power and Conservation Council's May 21, 2008 request, the ISRP reviewed the Confederated Tribes of the Warm Springs Reservation and the Oregon Department of Fish and Wildlife's (ODFW) Revised Master Plan for the Hood River Production Program (HRPP), which was originally developed in 1991. The HRPP consists of supplementation, research, monitoring, evaluation, and habitat improvements. It is jointly managed and evaluated by the Warm Springs Tribes and ODFW (Projects 1988-053-03, 1988-053-04, 1988-053-07, 1988-053-08, and 1988-053-15). The physical habitat project (1998-021-00) is managed by the Warm Springs Tribes. This is a Step 1 review in the Council's Three Step Review Process. Step 1 is the feasibility stage, and all major components and elements of a project should be identified. This review focuses on the HRPP sponsors' responses to the Step 1 scientific review elements specified by the Council (Chapter 3 of the Master Plan provides a reference to the review elements).

Although this is a Step 1 review, the ISRP has reviewed the HRPP proposals through four successive project selection processes, most recently in the FY 2007-09 review.¹ However, a Revised Master Plan was needed for a number of reasons, primarily because the sponsors propose to expand their production facilities and relocate fish from Pelton Round Butte hatchery on the Deschutes River to Hood River facilities. They also propose facilities to account for operational changes to the program resulting from the scheduled decommissioning of Powerdale Dam and its associated fish trap in 2010. The plan incorporates the results of fifteen years of monitoring and evaluation and the recommendations of numerous scientific review groups including, most recently, the Hatchery Science Review Group. The revised program is intended to accelerate the recovery of a native spring Chinook salmon population while providing Warm Spring Tribal members with consistent annual harvest opportunities. The revised plan implements specific activities called for in the Warm Spring Tribes' Memorandum of Agreement with the Bonneville Power Administration.

ISRP Recommendations

ISRP Recommendation: Meets Scientific Review Criteria – In Part (qualified). The ISRP recommends that the project sponsors edit and update the Step One Revised Master Plan for the Hood River Production Program before proceeding to Step Two.

The ISRP qualifies the recommendation because of concerns about: 1) using acclimation ponds to volitionally release steelhead in the mid/upper watershed where released fish can residualize; 2) using hatchery-origin adults for broodstock when natural fish are low in abundance, and; 3) insufficient justification for assessment methods for the monitoring component. The ISRP recommends "in-part" because facility improvements needed to implement the proposed spring Chinook rearing experiment are justified, but the construction of six production ponds at Moving Falls cannot be scientifically justified until the experiment is complete in 2018 and data analyzed. The six ponds are not needed for the experiment but are proposed for program implementation.

¹ ISRP 2006-6 Final Review of FY 2007-09 Proposals: www.nwcouncil.org/library/isrp/isrp2006-6.htm (pages 306-313)

Specifically, the ISRP recommends:

1. Adding a section in *Chapter 3: Proposed Production Alternatives* on winter steelhead production alternatives that evaluates the effect broodstock collections have on winter steelhead population dynamics and also evaluates the acclimation versus direct release of winter steelhead smolts relative to residualization, subsequent harvest opportunities, and excess spawning abundance of hatchery-origin winter steelhead.
2. Further development of *Chapter 4: Proposed Trapping and Collection Alternatives* to document the level of trapping and enumeration of both adults and smolts required to provide analytical (statistical power) to adequately assess the program, and consider additional electronic counting that may be valuable in this subbasin.
3. In *Chapter 5: Hood River Habitat Improvements* consider in more detail passive habitat improvement actions and strategies beyond adding large woody debris to the system.
4. Develop in *Chapter 6: Hood River Production Program Monitoring and Evaluation* an assessment and evaluation for the habitat enhancements proposed in Chapter 5.

ISRP Review Summary

Overall, this revision of the master plan is an impressive step forward in concept, decision-logic, organization, and scientific justification. This submission is greatly improved from the 1991 plan with more substantiated sets of goals and objectives within an adaptive ecosystem management framework. This framework builds on the analyses and scientific record from this watershed, demonstrating the value of rigorous monitoring of project actions. The plan provides relatively comprehensive guidance for proceeding with future artificial production activities in the Hood River Subbasin. Nonetheless, the ISRP detected some ambiguity or inconsistency in the biological goal of winter steelhead program. The plan identifies the program as "supplementation" with a goal of wild production recovery. However, other sections and tables describe a program that is primarily production for harvest. The number of hatchery-origin adults permitted to spawn naturally is smaller than the number of natural-origin adults collected for hatchery broodstock. Consequently the program will result in fewer naturally spawning fish than if the program was not in place.

Also, several elements of basic monitoring and evaluation warrant further consideration, especially, 1) adult and smolt enumeration and sampling, and 2) control-treatment assessment of habitat improvements. Finally, until results are analyzed and evaluated from a proposed experimental release for spring Chinook, there is no scientific justification for construction of six permanent raceways at Moving Falls on the West Fork of the Hood River. Each of these items is discussed in greater detail below.

In general, the Revised Master Plan elements incorporate best practices recommended by the Hatchery Scientific Review Group (HSRG), Independent Scientific Advisory Board (ISAB), and ISRP. The Revised Master Plan provides a realistic appraisal of the current program's limited effectiveness at achieving the biological objectives proposed within the original master plan. This evaluation was possible because of the rigorous and detailed monitoring and evaluation (M&E) program implemented by the co-managers, including the enumeration of each returning adult salmonid at the sampling facility located at Powerdale Dam. Because the planned removal of Powerdale Dam by PacifiCorp (in 2010) will render the fish trap at that location inoperable for the M&E activities implemented in the original

master plan, the Revised Hood River Master Plan proposes to construct and operate alternative fish counting and sample collection methods.

In support of the program's evolving goals and objectives, the Revised Master Plan includes evaluations of the Hood River Production Program relative to the biological objectives established in the 1991 Master Plan (O'Toole and ODFW 1991). The ten-year evaluation (1991 – 2001) concludes that the original Master Plan's biological objectives for adult abundance and harvest of spring Chinook, summer steelhead and winter steelhead were not being met (Underwood et al. 2003). The Revised Master Plan updates the biological objectives for juvenile and adult abundance and harvest of the three focal stocks – spring Chinook, and summer and winter steelhead. To achieve these updated biological objectives, a revised artificial production plan with additional facilities is proposed.

The Revised Master Plan eliminates artificial production for summer steelhead, maintains a status-quo production program for winter steelhead, and proposes an interim experimental rearing and release program that modifies the current strategy for spring Chinook. Currently, juvenile spring Chinook are reared at the Round Butte Hatchery and the Pelton Fish Ladder within the Deschutes River Subbasin. The juveniles are transported from these Deschutes River fish culture facilities to acclimation sites within the Hood River Subbasin, where they are volitionally released. Survival and return rates using this strategy have been poor. The proposed spring Chinook experiment will compare relative performance for the adult returns from juveniles raised in Hood River facilities, Deschutes River facilities, and at Carson National Fish Hatchery (all will be released in the Hood River). If results of this experiment indicate that acceptable rates of return can be produced by rearing juveniles entirely within the Hood River subbasin, project sponsors then request construction of six raceways at Moving Falls on the West Fork of the Hood River for fully implementing an expanded production plan.

All three programs – the elimination of the summer steelhead program, continuation of the winter steelhead production program, and the proposed experimental rearing and release of spring Chinook – meet scientific review criteria (though qualified on the issues of juvenile steelhead residualism and winter steelhead broodstock protocol as previously noted). Replacing the fish counting and collecting facilities at Powerdale Dam meets scientific review criteria, with qualification. The Revised Master Plan compares several alternatives and proposes using resistance-board-weirs at Moving Falls on the West Fork Hood River and on the lower East Fork Hood River below the confluence of the Middle and East Forks. The ISRP offers additional options for consideration (details below). Upgrades to the Parkdale Fish Facility and Moving Falls sites to execute the interim spring Chinook experiment meet scientific review criteria.

Planning and construction of Moving Falls fish facility for 2014 does not meet scientific review criteria. Table 27 (page 90) identifies that the comparative release study will not be complete until 2018. Construction of fish rearing facilities at Moving Falls is not justified until the studies are completed and results evaluated. This facility construction element of the Master Plan is why the Revised Master Plan received an **"In-Part"** recommendation – this part is not justified.

Residualism by Hatchery Steelhead. The effect of residualized steelhead (smolts that fail to migrate) on program success and natural parr was insufficiently addressed in the Revised Master Plan. Concerns about high levels of residualism by hatchery steelhead were highlighted in recommendations of the ten-year HRPP (Underwood et al. 2003) and the ISRP FY 2007-09 reviews of the associated project proposals. Those reviews recommended that the project sponsors develop monitoring and evaluation protocols to "assess the extent to

which the residualism of hatchery steelhead is resulting in the displacement of wild fish from Hood River habitat" (Underwood et al. 2003).

The implicit and prevailing assumption about residual fish is that any deleterious effect will be addressed by trucking those fish that did not volitionally leave acclimation sites to a release location below Powerdale Dam. The ISRP concludes that this assumption is not supported by evidence presented. In fact, parr which are not yet ready to migrate as smolts are believed to be leaving acclimation sites with smolts, but remain in the river. These yearling "residuals" may compete with and displace wild underyearling parr, but die over summer (likely due to physiological reasons). They may contribute little or nothing to subsequent smolt yields, while a few likely mature precociously and spawn with wild fish, thus decreasing fitness of wild spawners, and further confounding relative fitness comparisons. In addition, the presence of residualized steelhead could potentially be a key factor contributing toward creation of "hybrid swarms" with cutthroat trout. Issues of relative fitness of cutthroat and hybrid impacts were mentioned but not adequately addressed through experimental design and effective evaluation. See also the recent discussion on residualism of steelhead in Kostow (2008; Factors that contribute to the ecological risks of salmon and steelhead hatchery programs and some mitigating strategies, Reviews in Fish Biology and Fisheries, DOI [Digital Object Identifier] 10.1007/s11160-008-9087-9). The ISRP did not find anything specific in the Revised Master Plan for future monitoring of residual hatchery steelhead or evaluation of the potential consequences to wild parr. Given the displacement risk to wild fish, this monitoring is critical. The ISRP recommends considering direct stocking in the lower river as an option to avoid residualism higher in the watershed. The lower river is where fishing is concentrated, so harvest goals may be achievable using alternative release protocols.

Winter Steelhead Broodstock Collection. Our review on the winter steelhead production program is qualified because of a general ambiguity in the broodstock collection protocol (page 28). It appears to the ISRP that the original justification and purpose of the Hood River winter steelhead program has evolved in the Revised Master Plan. Originally, the purpose was to provide "supplementation" to rebuild the natural population. In this revision, it is clear the primary production purpose is to provide harvest. In fact, based on the project objectives in table 9 on page 37, there will be fewer fish spawning naturally with the program than without it. The program anticipates that 64 wild fish will be collected for hatchery broodstock but that only 24 hatchery fish will be permitted to escape for natural production. The justification that the population is sufficiently productive with these fish removed should be presented in more detail. We recommend an All H Analyzer (AHA) modeling approach to explore this justification.

Based on the investigations of relative reproductive success for winter steelhead in the Hood River (Araki et al. 2007), the sponsor's preferred protocol is to use only naturally produced parents as broodstock for hatchery production. However, for winter steelhead, the sponsors indicate (page 28) that should the 25% limit on collecting natural-origin winter steelhead provide insufficient numbers for hatchery production, they will "re-evaluate broodstock collection and consult with NOAA-Fisheries."

The ISRP identified several issues with this approach. First, while a 25% limit on collecting natural-origin fish for broodstock may ultimately prove to be a very reasonable and appropriate level to avoid "brood mining" and affecting natural productivity, there does not appear to be a description of the scientific basis for this threshold. Sponsors do not provide a basis or support for this exact threshold. Why not a higher or lower percentage? 25% of a large wild population may be insignificant, while 25% of a small population could be

problematic. In other words, the management decision should be contingent upon the strength of the wild run. Second, the sponsors propose to use serial hatchery fish (offspring of hatchery-bred fish rather than wild fish) when the 25% limit of wild adults falls below that needed to maintain production objectives. This scenario is expected to emerge especially in years with low wild adult returns. The ISRP recommends that rather than using hatchery-origin adults to maintain the artificial production program at preset levels, the program should be scaled to the natural adult return abundance. Third, the sponsor need not wait for the case where the 25% threshold is approached for consultation with NOAA Fisheries. There are a limited number of likely scenarios that can be predicted and addressed in advance. While not every contingency for population viability or relative reproductive success need be modeled, a limited number of likely outcomes should be modeled with a tool such as the All H Analyzer and developed *a priori* into a structured decision management pathway. Finally, the sponsors indicate they will evaluate in 2010 the need to alter production. Within an adaptive management context, evaluation is best viewed as a process undertaken periodically rather than a single event. Ultimately, the plan would benefit greatly from an expanded presentation of the manner, criteria, objectives, and periodic timeframes by which the co-managers will evaluate this need to alter production.

Winter steelhead harvest. Because the goal of the winter-run steelhead program is to meet a recreational and tribal harvest demand, the scale of hatchery fish releases should numerically reflect that need. Only 25% of hatchery steelhead has historically been harvested annually, on average. Some explanation is necessary as to why more hatchery fish are not harvested or why production should not be reduced to lower the surplus production. In contrast, there is also need for an explanation or justification on the quantity of wild harvest based on the population dynamics. Is there a harvestable surplus? Recruitment information on wild steelhead was not presented to address this, and should be (the data exist). Finally, the ISRP recommends examination of where in the watershed the harvest of hatchery fish is likely to be maximized with low impact on wild fish. Absent other information, it appears that harvest will be maximized lower in the watershed (i.e., in the first few kms). If so, this would negate the need for acclimation sites significantly further up in the watershed, thereby concentrating a terminal fishery within the lower watershed.

Monitoring and Evaluation. Chapter 6 provides a basic level description of the proposed M&E program. Appropriately, it avoids the unproductive tact of "measuring everything." Thus, the ISRP recommends developing the M&E plan components in more specific detail, rather than adding additional metrics as the Revised Master Plan proceeds through subsequent steps in the Three Step Process. The ISRP recommends that the M&E plan identify explicit linkage of the monitoring data to the evaluation needed to establish whether the winter steelhead and spring Chinook production programs are achieving their objectives. Certainly as the program adapts to new data and analysis, additional metrics may be added to the monitoring program.

An effective plan for evaluation of habitat improvement was not presented. According to the Revised Master Plan, habitat restoration will be pursued by placement of several hundred logs instream to improve the distribution of large woody debris. The restoration history, according to the subbasin plan and an excellent assessment and prescription plan seen in previous reviews, indicates many other past actions. Nonetheless, there appears a lack of attention to passive restoration techniques involving the removal of anthropogenic impacts (e.g., grazing in riparian areas) and allowing natural recovery processes to take place. A complementary passive habitat improvement prescription and rehabilitation is not mentioned, but is warranted, and could benefit from the involvement of professional hydrologists and fluvial geomorphologists.

As presented, the treatment and evaluation emphasized log emplacements, hypothesized to increase carrying capacity, and was largely dependent on recruitment analysis (adult-to-adult), which will be confounded by out-of-basin effects. A comparison of smolts-per-spawner as a function of the number of spawners in treatment and control areas (tributaries or whole watersheds) may be a more useful approach to evaluation. Perhaps a Gorge Province experimental design is possible, particularly if efforts were combined with those in the Wind River subbasin, and if select tributaries can be involved. At least, some of the metrics for habitat improvement effectiveness evaluation should be incorporated (ISRP 2008-7²). There is no empirical evidence of an increased natural production capacity currently, nor will one be detectable from adult returns alone, particularly with the confounding effects of current hatchery plans and dam removal. This potential increased capacity may be presented already within the subbasin plan's assessment section – if so, a concise summary is warranted. We suggest the recruitment and assistance of statisticians and Provincial workshops to further develop at Step Two an effectiveness monitoring program for habitat rehabilitation to evaluate changes to smolt and, ultimately, adult capacity (and see below).

Much of what has been proposed to evaluate fish production in relation to plans for hatchery fish introduction and for effectiveness of habitat improvements or harvest management following dam removal will be dependent on adult trapping and enumeration, with some reliance on smolt sampling. There may be several improvements possible to make the projects and program evaluations more effective. Further exploration of options for adult and smolt trapping and counting facilities need to be developed in a revision of Chapter 4 and appendix E and in the context of monitoring designs in the subbasin plan.

A primary concern for the ISRP was a lack of explanation of the trap performance goals in Table 18 (page 61). It is not clear how the M&E requirement of intercepting no less than 50% of the adult winter steelhead population meets the needs of the metrics evaluation in Chapter 6. There is also no mention of summer steelhead assessment using these facilities, but there are goals for natural production of summer steelhead that will need to be measured somehow. The capture guidelines are vague, "meet brood collection protocols." What specifically are the brood collection guidelines, and how will the trapping facilities be evaluated to meet these objectives?

For adults, there are additional enumeration, sampling, and trapping options to consider. For example, resistivity counters (see www.instream.net/counter.htm) or other electronic enumeration may be appropriate for this subbasin, where near-100% counting is possible, particularly if sub-sampling for adult fish can be incorporated by construction of partial trapping facilities. Some definition of the sample size requirements for relative fitness comparisons and other biological traits would also benefit the plans. Data exist from this watershed to provide these calculations on sample size requirements. While 100% adult capture was possible in the past (albeit with possible delays to migration), the proponents must now consider options and sample sizes with less than 100% (and likely less than 50%) sampling on adults. If electric counters do not provide sufficient biological samples, then further engineering effort should go towards development of a full sampling facility, recognizing, however, that even the best design will affect fish behavior and survival. Furthermore, there are operational constraints of full counting and sampling facilities in systems with highly variable flows as in this watershed. A method to correct for periods where flows overtop capture facilities should be included in the plans, either through a

² ISRP 2008-7. Metrics Review: Review of Project Reporting Metrics for the Columbia River Basin Fish and Wildlife Program: www.nwcouncil.org/library/isrp/isrp2008-7.htm

mark-recapture and/or partial trapping alternatives. Several options might be considered, including mobile fyke nets, angler catch, temporary (removable) trap designs, seines, etc. – each with constraints of their own for adult fish capture. While there appears to have been consideration of flow regimes and debris loads in the proposed trapping and collection alternatives, it seems inevitable that full-capture is unlikely without great expense, and without detrimental impact to local habitat. Frequent repairs may be required. Further, impact to fish behavior, largely through delayed migration, is also very likely. Thus, we encourage further exploration of less harmful alternatives.

On smolt capture, previously, the ISRP identified that more precise smolt estimation is possible with rotary screw traps where there are separate sites for the marking and the recapture of smolts (Dempson and Stansbury 1991, Schwarz and Dempson 1994). Recently, Bayesian techniques for population estimation (Muthukumarana, et al. 2008, Can. J. Stats. and see www.cmiae.org for a recent course announcement) have been shown to provide more precise estimation.

In the future (post-dam removal), evaluations of wild fish capacity, hatchery introductions, and habitat improvement effectiveness evaluations will rely more heavily on smolt statistics than the full-count adult statistics previously available. Thus, a more precise calculation of smolt production is justified. Monitoring in the Revised Master Plan should consider smolt enumeration at several sites. The Revised Master Plans should consider strategic placement of rotary screw traps in tributaries to determine their relative smolt contribution, tributary capacities, estimate migration mortality, and in the relation of these fish production metrics to habitat improvement.

Local expertise is required to carefully select treatment and control tributaries where rotary screw traps might be placed for fish marking to determine the relative contribution to overall smolt yield at a mainstem Hood River recapture and sample site. This could facilitate assessment of habitat improvement, impacts of residualized steelhead, the introduction of hatchery Chinook and steelhead, and general assessment of fish population dynamics. Some discussion and consideration of these options within the subbasin or in comparison to other subbasins in a cooperative Provincial context would be a great benefit that could also be an example and reference for others.

Adaptive Decision Making and Decision Pathways. An important element of all project master planning is the need for formal decision pathways for managing adaptively. For example, the sponsors indicate that “the need to resume supplementation (following the decommissioning of Powerdale Dam) will be evaluated after two generations...” The ISRP agrees that such evaluations are important parts of any major change in the subbasin. However, we also recommend other strategies (all H’s) be considered in addition to supplementation. Moreover, the sponsors should identify in advance what criteria will be used in the evaluation.

Appendices

Appendix B (ISRP Three-Step Review Questions) of the Revised Master Plan is very detailed in its responses to the required review elements and is excellent in cross-referencing the reader to documentation in the main Plan.

Appendix J (Winter Steelhead HGMP) was repetitive and lacked the required detail necessary for review and evaluation of experimental designs for monitoring and evaluation.

ISRP Comments on Step 1 Review Elements

A. All Projects

Does the Revised Hood River Production Program Master Plan:

- 1) Address the relationship and consistencies of the proposed project to the eight scientific principles (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section B.2) (Step 1)?

The eight Scientific Principles:

1. The abundance, productivity, and diversity of organisms are integrally linked to the characteristics of their ecosystem.
2. Ecosystems are dynamic, resilient and develop over time.
3. Biological systems operate on various spatial and time scales that can be organized hierarchically.
4. Habitats develop, and are maintained, by physical and biological processes.
5. Species play key roles in developing and maintaining ecological conditions.
6. Biological diversity allows ecosystems to persist in the face of environmental variation.
7. Ecological management is adaptive and experimental.
8. Ecosystem function, habitat structure and biological performance are affected by human actions.

ISRP Comments: Appendix B (ISRP Three-Step Review Questions) of the Master Plan is very detailed in its responses to the required Three-Step review elements and is excellent in cross-referencing the reader to documentation in the Master Plan. Appendix C (Subbasin Attributes and Life-History . . .) summarizes the subbasin attributes and life histories of sensitive Hood River salmonids. Appendix D summarizes limiting factors.

In the Revised Master Plan, the relationship between natural production, artificial production, and environmental conditions was inadequately considered. Figures 2 and 3 were very helpful to those of us who are not intimately familiar with the Hood River Subbasin. Chapter 5 provides a good description of habitat projects that are ongoing or proposed. This indicates that other H's (not solely supplementation) are being considered. Chapter 5 provides a rationale for habitat improvement that is necessary to achieve increases in production predicted by Ecosystem Diagnosis and Treatment (EDT) analysis and Unit Characteristic Method (UCM) modeling. It is not clear from this chapter, or the preceding sections on the status of the focal species in the subbasin, the extent of habitat improvements required to achieve the biological objectives set out in the Revised Master Plan. The ISRP did not examine in detail the ten-year review (Underwood et al. 2003) to determine the status of carrying capacity estimates for natural and hatchery fish in this system. If the poor outcome from the HRPP so far is owing to water withdrawals and instream habitat conditions within the subbasin, then modifications to the spring Chinook program are unlikely to yield additional harvest or successful reintroduction of this species.

- 2) Describe the link of the proposal to other projects and activities in the subbasin and the desired end-state condition for the target subbasin (Step 1)?

ISRP Comments: Co-managers identify that section 1.3 and Table 4 (pages 16 – 19) address the links between the Revised Master Plan and other projects and the end-state condition for the Hood River. As summarized above, the Revised Master Plan is not sufficient to conclude whether the actions in total within the subbasin are likely to achieve the biological objectives identified in the Revised Master Plan.

- 3) Define the biological objectives (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section C.2 (1) and (2), and Technical Appendix) with measurable attributes that define progress, provide accountability and track changes through time associated with this project (Step 1)?

ISRP Comments: Biological objectives with measurable attributes and a time frame are adequate.

- 4) Define expected project benefits (e.g. preservation of biological diversity, fishery enhancement, water optimization, and habitat protection) (Step 1)?

ISRP Comments: Adequate

- 5) Describe the implementation strategies (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section D.2) as they relate to the current conditions and restoration potential of the habitat for the target species and the life stage of interest (Step 1)?

ISRP Comments: Chapter 5 identifies habitat improvements but is unconvincing that the results will actually be realized. Achieving the biological objectives for spring Chinook reintroduction and harvest; winter steelhead harvest using artificial production; and summer steelhead population status improvement will undoubtedly require substantial habitat improvements within the subbasin to increase capacity for several life-stages including spawning, young-of-the-year, and smolt production. This improvement is not treated in sufficient detail.

- 6) address the relationship to the habitat strategies (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section D.3) (Step 1)?

ISRP Comments: See above. The general consideration of habitat measures is covered in Chapter 5. However, this section does not provide convincing evidence that habitat actions, that are likely to be initiated, will lead to improvements in capacity sufficient for the combined natural and artificial production to achieve the HRPP biological objectives.

- 7) Ensure that cost-effective alternate measures are not overlooked and include descriptions of alternatives for resolving the resource problem, including a description of other management activities in the subbasin, province and basin (Step 1)?

ISRP Comments: Adequate

- 8) Provide the historical and current status of anadromous and resident fish and wildlife in the subbasin most relevant to the proposed project (Step 1)?

ISRP Comments: Adequate

- 9) Describe current and planned management of anadromous and resident fish and wildlife in the subbasin (Step 1)?

ISRP Comments: Adequate

- 10) Demonstrate consistency of the proposed project with NOAA Fisheries recovery plans and other fishery management and watershed plans (Step 1)?

ISRP Comments: Consistency of the steelhead components of the Revised Master Plan with the lower Columbia River Recovery plan is asserted; however, specific elements of the recovery plan that would be met by implementing the Revised Hood River Master Plan are not detailed.

- 11) Describe the status of the comprehensive environmental assessment (Step 1 and 2)?

ISRP Comments: Reference is made to the Hood River Subbasin Plan and the ten-year evaluation of the HRPP. These include EDT and UCM modeling of habitat conditions for salmonid species.

- 12) Describe the monitoring and evaluation plan (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section D.9) (Step 1, 2 and 3)?

ISRP Comments: Revisions are needed before moving on to Step Two. The co-managers in this subbasin have a track record of high quality assessments. See recommended developments for the M&E that should be incorporated in a revision of the Step One documents in the summary above.

- 13) Describe and provide specific items and cost estimates for ten fiscal years for planning and design (i.e. conceptual, preliminary and final), construction, operation and maintenance and monitoring and evaluation (Step 1, 2 and 3)?

ISRP Comments: Costs are provided for upgrades to fish rearing facilities and traps. Cost for ten years for the overall project appears to be missing.

B. Artificial Production Initiatives

Does the Revised Hood River Production Program Master Plan address the following:

- 1) Address the relationship and linkage to the artificial production policies and strategies (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section D.4 and Technical Appendix) (Step 1)?

ISRP Comments: The artificial production tasks in the Revised Master Plan will employ best practices suggested by the Hatchery Scientific Review Group, ISAB, and ISRP. These include protocols for hatchery broodstock composition and restricting hatchery-origin adults' access to natural spawning locations. These protocols adequately address Artificial Production Standard 5. The monitoring and evaluation, together with the quantitative biological objectives should adequately satisfy the requirement for appropriate risk management (standard 8).

- 2) Provide a completed Hatchery and Genetic Management Plan (HGMP) for the target population(s) (Step 1)?

ISRP Comments: HGMPs are provided as Appendix I (spring Chinook) and Appendix J (winter steelhead).

- 3) Describe the harvest plan (see 2000 Columbia River Basin Fish and Wildlife Program, Basinwide Provisions, Section D.5) (Step 1)?

ISRP Comments: Adequate

- 4) Provide a conceptual design of the proposed facilities, including an assessment of the availability and utility of existing facilities (Step 1)?

ISRP Comments: Adequate

- 5) Provide a preliminary design of the proposed facilities (Step 2)?

ISRP Comments: Not applicable for this review. This is a Step 2 issue.

- 6) Provide a final design of the proposed facilities, including appropriate value engineering review, consistent with previous submittal documents and preliminary design (Step 3)?

ISRP Comments: Not applicable for this review. This is a Step 3 issue.