

# **Yakima**

## **Review Summary**

The Yakima Subbasin Plan's Assessment and Inventory components adequately meet most of the scientific elements called for in the Council's 2000 Fish and Wildlife Program and the Subbasin Technical Guide, but the Management Plan component falls short in providing prioritized objectives and strategies that are clearly justified by findings from the Assessment and Inventory. In addition, the description of the EDT assessment is unclear and the major restoration actions are not documented. Furthermore, the research, monitoring and evaluation component of the plan is incomplete. For all three components of this subbasin plan, there is a clear need to have an open and full treatment of the Yakima Klickitat Fisheries Program (YKFP); until it is included, this plan fails to cover the entire range of subbasin activities.

The relatively high quality of the Assessment and Inventory reflects the great deal of time and energy that went into these sections of the report. It appears that the planners ran out of time as they reached the later segments of the plan. Those end segments, however, are the most crucial because they define the goals set for the program, the actions to be taken, and the monitoring and evaluation to determine if the planned approach worked. Without more detail for those three issues, the rest of the report is less likely to have much real consequence.

As evidenced in the written plan and the presentation to the ISRP/AB, this planning process was a very positive social exercise, and the right people, agencies and entities were involved. Moreover, the documentation of public comment and response was impressive and very complete. The planners should be encouraged to move forward to improve the plan.

### **Assessment**

Overall, reviewers were favorably impressed with the Assessment. The significant amount of work that went into the Assessment was evident. The application of the conceptual foundation was particularly good, as was the separation of the subbasin into its components. The body of the assessment presents a summary analysis of key habitat attributes for each of the seven Assessment Units and the watershed as a whole. The data on flow and habitat were especially useful. Although the recognition that the altered hydrograph is a significant limiting factor is an important conclusion of this document, the planners need to take the analysis of the effects of flow a step farther. An analysis of the focal species and life history stages most impacted by the altered flow regime would provide some indication of what restoration actions (short of restoring the natural hydrograph) might address some of the flow effects. If there are no actions that would be effective for those sections of the subbasin impacted by current flow management, this finding would provide a strong rationale for either 1) focusing on actions that change the current flow management program before implementing other restoration actions or 2) concentrating on restoration in areas of the subbasin least impacted by the altered flow.

The overview is informative, concise, and provides adequate context for both current plan development and future plan users. In general, although the list of focal species was broad and adequately done, the reviewers have some general concerns and observations with the approach taken to identifying and assessing focal species and habitats. The general concerns are described

in the programmatic section of the ISRP/AB report. Specific to the Yakima Subbasin Plan, several of the focal species (sandhill crane, lamprey, sockeye salmon) were not considered by the reviewers to be good choices as focal species. The problems with the selection of these species are numerous. The available information about the current status of two of these species in the subbasin was generally very poor. The sandhill crane and the lamprey both seem to be very rare in the subbasin. Their limited distribution would suggest that changes in their abundance through time would not necessarily be a good indicator of the effectiveness of the overall restoration effort. The sockeye is an extirpated species in the subbasin, and the success of re-introduction may be due to factors other than the adequacy of the subbasin restoration plan. The goal to restore these species or to emphasize them in devising strategies for action is appropriate, but to use any of them as a "focal" species in an assessment is not particularly useful.

In regard to focal species, as the Yakima Plan's Research, Monitoring and Evaluation plan is developed in the future, the choice of focal species may need to be revisited to increase the likelihood that the intended effects of management strategies can be monitored. That stated, more can be done to characterize the biota beyond the selected number of focal species. Although this level of characterization may be beyond the guidance given for this round of subbasin reports, this problem must be rectified if we are to move to a broader consideration of all the biological implications of current patterns. The ISRP/AB describes this issue more fully in the programmatic section of this report.

To depict the ecological conditions of the subbasin accurately, the Assessment should include more details concerning artificial production and stocking activities in general, and the activities of the YKFP in particular. The reader was referred to Appendix J for information regarding the YKFP, and a review of those contents are given at the end. Because of the placement of information regarding YKFP in an Appendix, with little detail presented in the main body of this document, its relationship to the entire planning effort is confusing - that needs to be clarified.

The limiting factors discussion in the assessment and the plan was incomplete and inconsistent in some respects. Limiting factors for both terrestrial and aquatic systems are presented, but they are difficult to find because they are interspersed with other elements. Although the limiting factors were incorporated into the Management Plan as well, they were hard to relate back to the more detailed explanation in the Assessment. The procedure used to identify the limiting factors is not fully explained. The reader must assume that a reliable process was utilized to identify the limiting factors presented in the Key Findings in the Management Plan. For example, the assessment of limiting factors for the focal fish species by life stage and by stream reach was not described fully in the text. It appears that the limiting factors were derived during the gathering of ten years of EDT data, and the current report simply presents this information in a well-digested form. In the programmatic section of the ISRP/AB report, the review team offers comments that cut across subbasins on EDT and on the choice of focal species, but that are also relevant to the Yakima plan. Particularly important is the requirement that the results of EDT are used appropriately, including a clear statement of the uncertainties and limitations of each specific EDT application, and that these limitations are clearly acknowledged when EDT products are presented.

The authors did follow the suggestion to apply EDT as a diagnostic tool in subbasin planning, and because the Yakima subbasin has worked with EDT for over 10 years (page 2-381), it was particularly well positioned to conduct this analysis. Although the authors identify three templates (historic, current, and restoration), the presentation of the results is confusing. The authors refer to “ladder charts” and present expected changes under columns described as Degradation and Restoration. The interpretation of these diagrams (based on EDT documentation), however, is very confused by their statement that the charts “only apply to the Restoration reference condition ...”. Although the reviewers were forced at first to interpret what had been conducted, subsequent e-mails with members of the Aquatic Technical Team clarified how the Restoration scenario had been compared to the Current conditions. Readers should not have to guess at methods or comparisons, and section 8.2.2 should be edited (particularly the 1<sup>st</sup> paragraph of page 2.384) to ensure subsequent users can understand exactly how the analyses were conducted, and what was the basis for the Key Findings.

Reviewers have some concern that the framing of limiting factors is not based in the most relevant and current understanding of the role that human actions can have in changing landscapes, and the physical structure and biota of rivers. The limiting factors discussion seems constrained by a long history of flawed conventional wisdom about what selected fish species require. Using the specific requirements for single species based on the current dogma as a target may not lead to management decisions that will broadly benefit the subbasin biota. What evidence is there that we are not making the same kinds of narrow conceptual mistakes that led to removal of woody debris for several decades to enhance fish passage? Reviewers are not convinced that these limiting factor analyses are as firmly grounded in the most current understanding of ecology and the biology of watershed ecosystems. How and why will the species-specific approach produce different results from application of the same kind of limiting factor analysis that was done three decades ago?

The Assessment contains certain broad simple statements that contradict other statements in the documents. Some of these statements are demonstrably false (see Checklist Item I.E.3). Some of these specific statements seem to be constructed to ease the movement of a particular section of the plan without placing the statement in the broader context of empirical evidence and scientific understanding needed for a coherent plan. The plan would benefit from a revision that addresses these inconsistencies.

In summary, although it provides just enough information to develop a scientifically based management plan, the Assessment can be improved in the several areas addressed above.

### **Inventory**

The Inventory contains a great deal of excellent work, including a well-conceived strategy to relate projects to assessment findings. There are, however, several significant items that need further treatment to make the Inventory most useful. Most notably, a comprehensive description of the YKFP and its relationship to the subbasin needs to be provided; i.e., information needs to be summarized and synthesized from the appendices. The inventory of restoration programs is quite general. There is little or no specific description of the effectiveness of past actions. Completing this description would greatly increase the ability of future plan users to make

informed decisions about what kinds of projects should continue, what kinds should end, and what new project types are needed to accomplish the stated goals.

The planners deserve full marks for the effort that this subbasin has invested in the gap analysis and its design. The gap analysis was innovative and proactive. The effort could be made more understandable, however, by providing tables of key words that link the Assessment's Key Findings and the Inventory. Specific recovery goals under the ESA are not adequately covered. Moreover, the value of the gap analysis depends on the limiting factor analysis having been done (in the Assessment) correctly and appropriately, which is not clear (see comments above). Better links between the Inventory and the Assessment and more specific detail would help identify gaps or future needs.

### **The Management Plan**

The Management Plan is not nearly as well organized or as complete as the Assessment or the Inventory. Its organizational structure is more difficult to follow, and the RME portion is poorly developed. More work is needed to bring the Management Plan to the level of the first two parts. The sole explanation of the proposed management plan is contained in one huge table. While the table summarizes a lot of information from a large complex watershed, the table is unfriendly to readers, and, therefore, not very usable. Because of this problem, it was difficult for the reviewers to assess whether or not this table was accurate and/or effective. Beyond basic usability issues, the principle issue for revision is that the Management Plan contains insufficient synthesis. There is no prioritization of restoration strategies or actions, which should have been the primary purpose of this section of the document. Little explanation is provided for the selection of any given strategy over others, and the logic behind some choices was not obvious and even questionable in some circumstances.

The RME component of the plan needs significant work to capitalize on the good overall effort in the Assessment and Inventory. The RME for the diversity of issues and size of this basin will be a daunting task, but some general description of ongoing efforts, including a few examples, could have been presented along with identification of key uncertainties in the plan that are not currently being addressed through existing RME efforts. The ISRP/AB is aware that the YKFP is capable of developing a large-scale RME program, but the subbasin plan participants will need to work together to develop an overall plan. The lack of integration of this plan with the YKFP that has already been developed and reviewed was conspicuous and is a clear indication of the work remaining in the RME sections.

## **Review Checklist**

### **I. The Subbasin Assessment**

(See generally pages 4-6, 9-10 of the Technical Guide; the checklist is derived from 18-24 of the Technical Guide.) Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin assessment.

<b>I. A. Subbasin Overview</b>		
<i>General Question to be addressed: Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin? The Council specifically asked that the independent scientific review evaluate whether the subbasin assessment was thorough and substantially complete. The following checklist is to aid reviewers in that determination.</i>		
<b>I. A.1. General Description</b>	(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
I.A.1.1	Does the assessment provide a general orientation to the subbasin (location, size, distinguishing natural and cultural features, land use, land ownership) and an overview of jurisdictional authorities (state, county, federal lands, tribal lands and fishing rights)?	
Reviewers: Tribal fishing rights are not described in sufficient detail.		Yes 1
I.A.1.2	Does the assessment provide a general description of the subbasin's macro-environment (geology, climate and weather, land cover, vegetation) and of the subbasin's water resources (hydrography and watersheds, hydrologic regimes, water quality, riparian and wetland resources), water uses, and modifications to water resources (hydropower projects and operations, water diversions, channel modifications)?	
Reviewers: No additional comment.		Yes 0
I.A.1.3	Does the assessment provide a general description of anthropogenic disturbances to the aquatic and terrestrial environment, organized by the source of disturbance (urbanization, agriculture, forest practices, water development, mining, transportation, and other)?	
Reviewers: Anthropogenic disturbances were generally described but were not necessarily organized by source of disturbance. The plan could be improved by including descriptions of how those disturbances connect to the kinds of changes that play out to influence the biology of the rivers.  It would be helpful for the planners to refer to the five-factor diagram that was developed for coupling with an IBI analysis to track changes in the biota of rivers as a result of human actions. That diagram can be found in several places. It was first published in a simple version in a paper in 1981 in Environmental Management by Karr and Dudley and later in a paper from the Illinois Natural History Survey (Karr et al. 1996). Another more detailed presentation can be found in Ecological Applications (Karr 1991). It can also be found in the 1999 Island Press book "Restoring Life in Running Waters" and in a 2004 paper on TMDL in Journal of Environmental Engineering (Karr and Yoder), as well as in the National Academy Report Restoration of Aquatic Ecosystems (figure 5.5, page 189). The five major factors are water quality, physical habitat alteration, flow regime alteration, energy source changes, and changes in biotic interactions. Scientists and planners need to do a better job with these analytical programs of understanding the mechanisms of operation and change that go from specific human action(s) to manifest themselves as changes in the biology of rivers. comment here		Yes 1

I.A.1.4	Does the assessment provide a list of native and non-native fish and wildlife species present in this subbasin including those species that: a. have been designated as threatened or endangered under the Federal Endangered Species Act or state equivalents, b. have been recognized by applicable federal, state, or local resource management agencies, or by the Nature Conservancy or state heritage program, as being especially rare or significant in the local area, c. have special ecological importance within the subbasin, d. are recognized by Native American tribes as having special cultural or spiritual significance, or e. are not native to this subbasin?		
Reviewers: The Assessment included a good listing overall, but fish and wildlife recognized as culturally important to Native American tribes could be better described.comment here		Yes	1
I.A.1.5	Does the assessment identify plants that have been designated as threatened or endangered under the Federal Endangered Species Act or state equivalents, and/or that are recognized by Native American tribes as having special cultural or spiritual significance, or (optional) that have special ecological importance within the subbasin?		
Reviewers: Although plants were not explicitly covered, some individual species are mentioned in the text.comment here		Partial	2
<b>I.A.2. Subbasin in the Regional Context</b>		<i>(Y)es, (P)artial, (N)o</i>	<i>Need for additional treatment (0-4)</i>
I.A.2.1	Does the assessment describe how this subbasin fits within its regional context (size in relation to the total Columbia Basin, placement within the ecological province and relationship to other subbasins in this province, qualities that distinguish this subbasin from others in the province)?		
Reviewers: Well stated, although the subbasin is placed within the context of the ecoprovince in the upper basin only. Distinguishing characteristics are provided, but not in the overview. comment here		Yes	0
I.A.2.2	Does the assessment describe this subbasin's relationship to Endangered Species Act planning units (NOAA Fisheries-designated evolutionarily significant units (ESU) and U.S. Fish and Wildlife Service-designated bull trout planning units.) where this information was available during the planning process?		
Reviewers: Addressed, but not specifically in the overview.comment here		Yes	0
I.A.2.3	Does the assessment summarize external environmental conditions that might have an effect on fish and/or wildlife in this subbasin (the ocean, the estuary, the mainstem downstream from the subbasin, and, as relevant, upstream areas and adjacent subbasins)?		

<sup>1</sup> The USFWS bull trout planning hierarchy includes, from large areas to small, distinct population segments, recovery units, recovery sub-units, core populations, core areas, and local populations. A subbasin would typically correspond to a recovery unit or sub-unit.)

Reviewers: The plan would benefit from a more specific description of the mainstem dams that have to be negotiated by adult and juvenile salmonids. Such a description would have been useful in interpreting the table that shows Snake River and lower Columbia River SARs, although the information on Snake River SARs is not relevant here. Also, the plan's treatment of Lower Columbia data requires the reader to take the next step in analyzing the data; a summary analysis of these data in the plan would be preferable.		Partial	1
I.A.2.4	Does the assessment identify macroclimate and human occupation and use trends that may affect hydrological or ecological processes in this subbasin over the long-term (50 years into the future and beyond)?		
Reviewers: No additional comment.comment here		Yes	1
<b>Summary comments and evaluation on the Subbasin Overview:</b>			
Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin?			
Reviewers: This section is informative and concise, providing an adequate overview. comment here		Yes	0

<b>I.B. Species Characterization and Status</b>			
<i>General question: Does the assessment adequately describe the current status of fish and wildlife focal species?</i>			
Note to Reviewers: for this section of the review, the checklist should be applied to each focal species. Please identify which species your evaluation applies to in the comment field. Use the ranking fields (Y,P,N; 0-4) to give an overall evaluation across all focal species. Note differences among approaches to species in the comment field. If necessary, once the plans are received, assignments will be made to cover an individual species or a series of focal species.		(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
I.B.1. Does the assessment identify a series of focal species that will be used to characterize the status of fish and wildlife species within the subbasin? These should include one or more wildlife, resident fish, and, where present, anadromous fish species. Anadromous fish may also be included in subbasins where they were historically present and where there is a reasonable probability that these fish could be restored to sustainable levels. Criteria suggested for selecting focal species include a) designation as Federal endangered or threatened species, b) local ecological significance, <sup>2</sup> and c) cultural significance.			
Reviewers: In general, although the list of focal species was broad and adequately done, the reviewers have some general concerns and observations with the approach taken in many of the subbasin plans to select and assess focal species and habitats. The general concerns are described in the programmatic section of this review. Focal species should be species that are closely related to the habitat that is the focus of management actions. From this perspective, the reviewers have significant concerns with the choice of some of the focal species (e.g.,		Partial	1

<sup>2</sup> Species that could be considered under the ecological significance criterion might include those that: a) are particularly rare within the subbasin (regardless of ESA classification), or b) perform a particularly important or unique ecological function.

<p>sandhill crane, sockeye, and lamprey) specific to this plan.</p> <p>The goal to restore these species or to emphasize them in devising strategies for action is appropriate, but to use any of them as a "focal" species in an assessment is not particularly useful. The available data on the species are inadequate to assess current habitat availability and condition. Monitoring the effects of any actions is likely to be difficult for these rare/extirpated species. If the monitoring problems could be addressed, the rarity and limited distribution of these species would suggest that they would not be good indicators of the overall effectiveness of the restoration plan.</p> <p>For wildlife species, the value of identifying focal species would be increased if the planners conducted a census of the animals (a baseline) and proposed to monitor the animals (presence, habitat use, etc).</p> <p>Assessment of the plan's effectiveness might be improved by including some integrative activities that look at the integrity of the entire biological system as a whole (e.g., species diversity, indices of biological integrity), rather than relying on the response of individual species. In our programmatic comments we suggest that it may be beneficial to assess the response of sets of species with comparable habitat requirements rather than the abundance of a single species.</p> <p>Despite the concerns about the choice of the focal species, the plan's subsequent treatment of the species (points below) was, for the most part, well done.</p>		
<p>I.B.2. Does the assessment identify and characterize focal species populations; i.e. delineate unique population units and, as applicable and where information is available, meta-populations, subpopulations and/or other genetic/behavioral groupings used by scientists or managers?</p>		
<p>Reviewers: Mostly complete given data availability; i.e., although the extent and availability of the data (population dynamics, current distribution, demographics, etc.) are both highly variable, when data are available they seem to be incorporated adequately. Very little is presented for (non-fish) wildlife.</p> <p>P. 2-240: The term "with specified biological limits" appears in the second line of the page. What does that phrase mean? Who is specifying those limits? What are the biological factors or parameters that are considered in this context? Also, how is "sufficient to support" determined? What is monitored and how are these judgments made? These issues relate to how one will decide if progress is being made, if restoration or conservation is successful, and so on. The text here and elsewhere is too vague to discern these issues.comment here</p>	<p>Yes</p>	<p>0</p>
<p>I.B.3. Does the assessment describe the current and historic status of each focal species population and summarize available population data (abundance, productivity, spatial structure, etc., with particular emphasis on trend data)?</p>		

<p>Reviewers: Mostly complete, given data availability. The "benchmark" is to restore numbers of all focal species to pre-1850 abundance. This is so ambitious that it becomes impractical to the point of being unable to accept it as an explicit goal; e.g., taken to a basin scale, that would mean 12 to 16 million salmon for the Columbia River system. Given that it will be impossible to eliminate all effects humans have had on the subbasin over the last 150 years, restoring salmon to levels occurring prior to the arrival of European-Americans at the scale of entire subbasin seems unrealistic. At best this goal might be achieved in only a few places. comment here</p>	<p>Yes</p>	<p>0</p>
<p>I.B.4. Does the assessment describe the population's life history, including identifying distinct life stages?</p>		
<p>Reviewers: Mostly complete, but the discussion of the Pacific lamprey's life history needs clarification. A paragraph may have been misplaced. Lamprey sub-adults (or young adults) migrating downstream to sea are not "smolts". That term is reserved for salmonids. Passage problems at the mainstem dams should be emphasized as a (the) key problem with lampreys. Here again, the number of lampreys seen in recent times raises the question of whether lamprey are a comprehensive and useful focal species for which sufficient natural history information exists to know anything about what is really going on with this species. comment here</p>	<p>Partial</p>	<p>1</p>
<p>I.B.5. Does the assessment characterize the genetic diversity of the population, especially regarding possible effects of artificial production? Specifically does the assessment describe the historic and current status of introductions, artificial production, or captive breeding programs in this subbasin or affecting the subbasin through straying or other means, and describe the relationship between the artificial and naturally produced populations?</p>		
<p>Reviewers: Although there is a discussion of genetic characterization for a number of the focal species, there is only a superficial treatment of the potential effects of artificial propagation. Very little information is provided on the history and extent of past introductions. Perhaps most obviously lacking is a detailed inventory of past and present stocking and supplementation programs; i.e., what and how many of each species are being stocked where - and at least as importantly, why?</p> <p>In addition, the discussion on the potential for introduction of sockeye salmon missed the point that the Lake Wenatchee population is a mix arising from past introductions from three or four sources, following extirpation of the local stock due to dams on the Wenatchee River constructed early in the 1900s. comment here</p>	<p>Partial</p>	<p>3</p>
<p>I.B.6. Does the assessment describe historic and current harvest, including both in-subbasin harvest and downstream or ocean harvest affecting the focal species?</p>		
<p>Reviewers: The plan's treatment of harvest is reasonably complete, but would benefit from more information on out-of-basin harvest impacts on Yakima stocks, if that exists. The planners can likely develop better estimates for in-river (Columbia) and ocean harvest rates from coded wire tag recoveries.</p>	<p>Partial</p>	<p>1</p>

	<b>Summary comments and evaluation on the Species Characterization and Status Subsection:</b> Does the assessment adequately describe the current status of fish and wildlife focal species?	
<p>Reviewers: The effort put into the Species Characterization and Status Subsection is impressive with one obvious exception, the significant omission of a comprehensive discussion of artificial production and stocking information. Inclusion of this information is especially important given the prominent role these activities have played within the basin over many years and the implied intent to continue or expand these activities in the future.</p> <p>More can be done to characterize the biota of these places beyond the selected number of focal species. Although this level of characterization may be beyond the guidance given for this round of subbasin reports, this problem must be rectified if we are to move to a broader consideration of all the biological implications of current and future management actions. This broader perspective is also needed to make the signal used to understand status and trends in these systems more robust and useful for interpreting the effectiveness of conservation and restoration efforts.comment here</p>	Partial	2

<b>I.C. Environmental Conditions</b>		
<i>General question to be addressed: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?</i>		
<b>I.C.1. Environmental Conditions within the Subbasin</b>	(Y)es, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>
I.C.1.1	Does the assessment describe the current condition of the environment in this subbasin, and characterize the condition of the environment under the following reference conditions: a) historic, <sup>3</sup> b) potential, <sup>4</sup> c) future/no new action, <sup>5</sup> and the potential condition of aquatic and terrestrial habitats within the subbasin? Does the assessment include a determination of the difference between current conditions and the various reference conditions?	
<p>Reviewers: Although the Assessment did not include a specific organization section labeled “Environmental Conditions within the Subbasin”, much of the information was scattered throughout this document. The plan applied current, historical, and future restoration conditions for spring and summer/fall Chinook, coho, and summer steelhead. Assessments, however, were not provided for bull trout, sockeye salmon, or lamprey.</p> <p>Because the Assessment continually refers to the lack of information on pre-1850s conditions, the choice of a different reference point, at least as a temporary measure would have been useful. More importantly, the factors</p>	Partial	1

<sup>3</sup> The historic condition refers to the state of the environment at the time of European settlement, or 1850.

<sup>4</sup> The potential condition is defined as the optimal condition for the subbasin in the year 2050, but it acknowledges cultural modifications that are not reversible such as urbanization.

<sup>5</sup> The future/no new action condition is the state of the environment in 2050 assuming that current trends and current management continues.

<p>that were assumed in the future condition should also be documented.</p> <p>Although setting the benchmark as pre-1850 initially seems like an attractive idea, it is largely impractical for any but the most superficial information about the biology of these places. For that reason, it is important to have some kind of backup strategy for establishing objectives that is based on the best available current information or some other logical and scientifically defensible approach to setting standards and defining goals. More thought needs to be given to this because of our inability to set those pre-1850 benchmarks with any reliability.comment here</p>			
I.C.1.2	Does the assessment classify 6 <sup>th</sup> field HUCs (or other appropriate assessment units) within the subbasin according to the degree to which each area has been modified and the potential for restoration?	Yes	0
<p>Reviewers: Although there is good specification and identification of individual tributaries within the subbasin and their characteristics, they are not classified in the HUC system and the scale of the assessments was much larger than 6<sup>th</sup> field HUCs. The classification and spatial scale of assessment units were, however, adequate for this planning process.</p>			
<p><b>I.C.2. Out-of-Subbasin Effects and Assumptions</b></p>			
I.C.2.1	Does the assessment identify factors outside of the subbasin that have a significant effect on each focal species, with particular attention to bottlenecks? These might include effects associated with upstream conditions, downstream conditions, and, in the case of migratory wildlife, conditions in adjacent subbasins. Outside effects are particularly relevant for anadromous fish and may include mainstem passage and habitat, estuary conditions, ocean conditions, and harvest.	Partial	2
<p>Reviewers: An entire section (#7, p 366) is provided on this point, based on an Oregon TOAST report. The assessments, however, could have been more specific, at least with respect to currently available data. More detail on critical out-of-basin impacts could have been provided; e.g., there is little reference to the myriad of potential survival bottlenecks or how artificial production might influence mortality processes at these bottlenecks. A broader view needs to be taken of potential causes of problems. The reviewers recognize that the TOAST report is not a product from these planners, but the material contained in that report could have been better tailored to this subbasin.</p> <p>Furthermore, survival estimates are not based on the best information available. The Snake River information on SARs is not relevant and is a distraction for this basin. There is not an adequate discussion of mainstem survival of smolts, the changes that have occurred in the past and possible changes in the future, nor the implications for production within the Yakima basin. The white paper by Ferguson et al, 2004 that was provided in response to the remand would be an easy source for this information, along with the December 21, 2003 NOAA white paper, "Effects Of The Federal Columbia River Power System On Salmon Populations", by the Fish Ecology Division Northwest Fisheries Science Center, National</p>			

Marine Fisheries Service, National Oceanic and Atmospheric Administration, 2725 Montlake Boulevard East, Seattle, Washington 98112-2097 (Williams et al.) For both papers go to: <a href="http://www.salmonrecovery.gov/R_Analysis.shtml">www.salmonrecovery.gov/R_Analysis.shtml</a> .comment here			
I.C.2.2	For each focal species, does the assessment establish assumptions for each external effect that can be used to calculate the effects of external conditions on the productivity and sustainability of fish and wildlife within this subbasin?		
Reviewers: This is not explicitly done. Again, information presented is only based on a TOAST 2004 report. The assumption would be that any change in productivity and sustainability would be a function of changes within the subbasin; OOSE should only affect productivity estimates		Partial	2
<b>I.C.3. Environment / Population Relationships</b>			
For each focal species, does the assessment identify, for each life stage, environmental factors that are particularly important for the species' survival and determine the characteristics that constitute optimal conditions for species health? Does the assessment describe and make a finding regarding the environment's ability to provide such optimal conditions, or conditions that support the long-term viability of these populations.			
Reviewers: Apparently, this was done using EDT (see the reviewers' programmatic comment on EDT). The comment above on Pacific lamprey applies here as well. There is a potential advantage to delving into the biological dynamics of the system as a whole in important ways unconstrained by the selection of a few sometimes poorly selected individual focal species. This selection approach creates blinders that do not allow the planners to see other important biological signals and may conceal important diagnostic information on what specific human actions are responsible for the observed patterns. Because EDT results were only summarized by adult-to-adult stages, not by the life-stage data available in the more detailed EDT data files, it was difficult to determine exactly what the authors used in S8.2.2.		Yes	1
<b>Summary comments and evaluation on the Environmental Conditions Section:</b> Does the assessment adequately describe the effect of the environment on fish and wildlife populations?			
Reviewers: Although the section on Environmental Conditions was done reasonably well, organization of the details could be more reader friendly. Furthermore, even though the use of EDT addresses this issue for a few species, the majority of the focal species is not addressed fully, nor is there an indication how environmental conditions for these species could be considered. External effects on local stocks should be included in the expected results of implementation of strategies.  This section does not do a good enough job of connecting explicitly human actions with biological results. Although this would not be an easy task, efforts should be made now to begin the process of doing a better job on it.comment here		Partial	2

<b>I.D. Ecological Relationships</b> <i>Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?</i>	(Y)es, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>
<b>I.D.1. Inter-species Relationships</b> Does the assessment identify important inter-species relationships or interactions, both positive and negative, with specific attention to relationships between anadromous fish and wildlife and specifically identify: 1) wildlife species and habitats that may be influenced, positively or negatively through direct effects of changes in fish abundance or fish community composition; 2) fish species and habitats that may be influenced, positively or negatively, through direct effects of changes in wildlife abundance or wildlife community composition; and 3) key species relationships within this subbasin based on the above?		
<p>Reviewers: The Assessment partially covers this. The treatment of supplementation's effect on competition is inadequate. Further description is needed of how the planners arrived at the conclusion of little to no competition (p. 241).</p> <p>P. 2-17: Principle 13. The suggestion that intraspecific and interspecific competition is the driver of species diversity and life history diversity is simply not correct. This statement proposes that there is a very narrow window through which we can understand living systems. Disease, predation, mutualism and so on are also very important.</p>	Partial	1
<b>I.D.2. Processes and Functions</b> Does the assessment identify key ecological functions for species within this subbasin and assess the current status of ecological processes and functions in the subbasin?		
<p>Reviewers: The plan includes a subsection on Ecological Processes and Functions that addresses the issue at a reasonable level, and much of this information also is touched upon in earlier sections of the document. When little is known about an ecological process or function, planners should consider identifying it as a Key Uncertainty (e.g., pathogens).</p> <p>The plan could be improved by a clear and comprehensive documentation of what the authors meant regarding “processes.” Page 2-239: Has “ecosystem processes” been defined here? People use the term “process” in many different ways. Without a clear definition it is hard to tell exactly what is meant by its use in this document. There is a tendency in recent years to use the term “ecological processes” in only a very narrow sense. Although there are in fact many different processes, those to which authors typically refer are hydrological and/or nutrient cycling/energy flow. Clarifying the intended meaning would improve this section of the Assessment.comment here</p>	Yes	0

<b>I.E. Interpretation and Synthesis / Limiting Factors and Conditions</b>
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<p><b>I.E.1. Limiting Factors and Conditions</b></p> <p>Does the assessment describe:</p> <p><b>1) Historic factors or conditions</b> that led to the decline of each focal species and of ecological functions and processes?</p> <p><b>2) Current key factors or conditions</b> within and without the subbasin that inhibit populations and ecological processes and functions relative to their potential.</p>		
<p>Reviewers: Limiting factors are provided for both terrestrial and aquatic systems, but organizationally, they are difficult to find because they are interspersed with other elements. Although the limiting factors were incorporated into the Management Plan as well, they were hard to relate back to the Assessment to find more detailed explanations. Much of the limiting factor analysis is not presented, but is assumed within the Key Findings in the Management Plan. comment here</p>	<p>Yes</p>	<p>2</p>
<p><b>I.E.2. Key Findings</b></p> <p>Is the knowledge gained through the assessment synthesized in regard to: 1) the status of species, 2) the status of the subbasin environment, 3) the biological performance of focal species in relationship to the environment, 4) the health of the overall ecosystem, 5) potential conflicts and compatibilities between individual species and ecological processes, 6) a determination of the key factors that impede this subbasin from reaching optimal ecological functioning and biological performance?</p>		
<p>Reviewers: Although key findings were listed in specific sections for wildlife, for aquatic systems they were laid out in the Assessment less clearly. The key findings are specified in an itemized manner without adequate synthesis or explanation. The presentation's list of the priority key findings was good and should be in the plan. The key findings of the EDT analysis are not adequately presented -- no appendix of outputs.</p> <p>The key finding that credited the supplementation program with creating harvest for the first time in 40 years needs to be better justified. The primary component of the Yakima fishery was wild fish, and the majority of Columbia River Basin stocks were doing relatively well in those years.</p>	<p>Partial</p>	<p>2</p>
<p><b>I.E.3. Subbasin-wide Key Assumptions/Uncertainties (“Working Hypothesis”)</b></p> <p>Does the assessment describe the key assumptions (including uncertainties) that have been made in the “Key Findings” above, and document the data sources and/or analytical tools relied upon?</p>		

<p>Reviewers: For the most part, Yes, but again, organizationally, the key assumptions were hard to locate. In addition, in many instances things listed as key uncertainties were certainly not stated as such (e.g., see those listed for spring chinook).</p> <p>On Page 4-4. There is a statement that water quality and flow are the "principle [sic] indicators of a healthy river ecosystem." This broad simple statement, however, contradicts other statements in the documents and is demonstrably false. The clearest indicator of the health of a river biota or ecosystem is the condition of the biology in that river. Such broad generalizations (in this quote and elsewhere in the plan ) are contradicted by statements elsewhere in the plan. Some specific statements seem to be constructed to ease the movement of that section of the plan without placing the statement in the broader context of empirical evidence and scientific understanding needed for a coherent plan. As another example see earlier statement regarding the role of competition. The plan would benefit from a revision that addresses these inconsistencies.</p>	<p>Partial</p>	<p>2</p>
<p><b>Overall impression and evaluation of the Assessment:</b>  Does the assessment adequately synthesize the information regarding the health and functioning of this subbasin ecosystem? Does it adequately: a) bring together the single-species and community assessments to form a holistic view of the subbasin’s biological and environmental resources, b) provide a foundation for the development of scientific hypotheses concerning ecological behavior and the ways that human intervention might prove beneficial? As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please (e.g., socio-economic descriptions or analysis).</p>		
<p>Reviewers: Overall, reviewers are favorably impressed with the Assessment. The significant amount of work that went into the Assessment is evident. The application of the conceptual foundation is particularly good, as was the separation of the subbasin into its components. The body of the Assessment presents summary analysis for the seven Assessment Units and the watershed as a whole for key habitat attributes.</p> <p>The data on flow and habitat were especially useful. Although the recognition of the altered hydrograph as a significant limiting factor is an important conclusion of this document, the planners need to take the analysis of the effects of flow a step farther. An analysis of the focal species and life history stages most impacted by the altered flow regime would provide some indication of what restoration actions (short of restoring the natural hydrograph) might address some of the flow effects. If there are no actions, other than altering flow, that would be effective for those sections of the subbasin impacted by current flow management, this finding would provide a strong rationale for either focusing on actions that change the current flow management program before implementing other restoration actions or concentrating restoration in areas of the subbasin least impacted by the altered flow.</p>	<p>Yes</p>	<p>2</p>

There is, however, a lack of detail concerning artificial production and stocking activities in general, and the activities of the YKFP in particular. The reader is referred to Appendix J for information regarding the YKFP, and a review of those contents are given at the end. Because of the placement of information regarding YKFP in an Appendix, with few details presented in the main body of this document, its relationship to the entire planning effort is confusing - that needs to be clarified.

The process used to assess limiting factors for focal fish species by life stage and by stream reach is not clearly described in the text. We gather that the analysis is based on old EDT data. The Assessment presents these EDT results in a highly abbreviated form and provides little indication of the assumptions or quality of the data that were used in the EDT assessment.

In the programmatic section of the ISRP/AB report, the review team offers comments on EDT and choice of focal species that cut across subbasins but are also informative to the Yakima plan. Particularly important is the requirement that the results of EDT are used appropriately, and that the limitations of EDT are clearly acknowledged when EDT products are presented.

As the Yakima Plan's Research, Monitoring and Evaluation plan is developed in the future, the choice of focal species may need to be revisited to increase the likelihood that the intended effects of management strategies can be monitored. Although this effort might focus on the selection of additional focal species, it should also incorporate other approaches to measuring effects on living systems in a broad context.

Reviewers have some concern that the identification of limiting factors is not based on the most relevant and current understanding of watershed biology and ecology and the effect of human actions on these systems. The limiting factors discussion seems too constrained by conventional wisdom about what selected fish species require. Using the specific requirements for single species may not lead to management decisions that will broadly benefit the subbasin biota and ecosystems. What evidence is there that we are not making the same kinds of narrow conceptual mistakes that led to removal of woody debris for several decades to enhance fish passage? Reviewers are not convinced the limiting factor analyses are as firmly grounded in the most current understanding of ecology and biology of watershed ecosystems. How and why will the species-specific approach produce different results from application of the same kinds of limiting factor analysis that were done one, two, or three decades ago? (See Editorial and Other Specific Comments below the checklist for additional detailed comments on the Assessment.)

<b>II. The Inventory</b>			
<i>(This checklist section was developed from pages 11-12 of the Technical Guide.)</i>			
<i>Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin inventory, specifically whether the inventory includes an assessment of the adequacy of current legal protections, plans, and projects to protect and restore fish, wildlife, and ecosystem resources. Does the inventory adequately synthesize past activities and their biological achievements? Planners were requested to, as applicable, describe the extent to which these programs and activities extend beyond the subbasin to a larger scale (provincial and basin-wide).</i>			
<b>II.A. Existing Protection</b>		<i>(Y)es, (P)artial, (N)o</i>	<i>Need for additional treatment (0-4)</i>
II.A.1	Does the inventory identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?		
Reviewers: The Inventory includes good descriptions of government, local initiatives, and major programs within the basin and the related activities and protections. The locations of protected areas, however, were not specifically summarized in the Inventory.comment here		Yes	0
II.A.2	Does the inventory assess the adequacy of protections for fish, wildlife, and ecosystem resources?		
Reviewers: Although the current protection efforts are noted, little is presented in terms of their adequacy. A qualitative assessment of adequacy would improve the plan and help in the identification of key locations where adequate protection is not being provided. comment here		Partial	1
<b>II.B. Existing Plans</b>			
II.B.1	Does the inventory identify and review applicable local, state, tribal, and/or federal fish and/or wildlife management plans and water resource management plans that affect fish and wildlife?		
Reviewers: Quite complete.comment here		Yes	0
II.B.2	Does the inventory assess the extent to which existing plans are consistent with the subbasin assessment and their adequacy in protecting and restoring fish, wildlife, and ecosystem resources? (It is possible that this analysis is done in another section of the plan, e.g. in the management plan.)		
Reviewers: A comparison of current plans against the problems identified in the Assessment is not explicitly provided. Although the Inventory does not refer specifically to the Assessment, the programs described in the Inventory presumably have influenced the current status of the subbasin, which is described in the Assessment and are further discussed in the Management Plan. The plan did not describe the Washington Salmon Recovery Funding Board (SRFB) and other plans adequately.		No	3

<b>II.C. Management Programs / Restoration and Coordination Projects</b>		
Does the inventory identify management programs implemented through on-the-ground restoration and conservation projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife? These include, at a minimum, those implemented within the past five years regardless of funding source.		
II.C.1	Does the inventory identify ongoing or planned public and private management programs or initiatives that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas? <sup>6</sup>	
Reviewers: Reasonably complete, with the exception of the omission of details concerning the YKFP and projects being funded by the SRFB. The Inventory might have provided a list of BPA-funded projects in the basin but these may be contained in the database. The plan noted the inventory was still in development. comment here		Partial 2
II.C.2	For each management program (or project where not clearly part of an overarching management program), does the inventory describe the program, project or activity; identify the management or lead entity; identify how the program/project was authorized and who is responsible for implementation; identify the funding source; and identify the relationship to other activities in the subbasin?	
Reviewers: For the most part, yes, with the exception of the omission of details concerning the YKFP and SRFB funded projects. comment here		Partial 2
II.C.3	For each management program (or project where not clearly part of an overarching management program), does the inventory identify limiting factors or ecological processes the activity is designed to address?	
Reviewers: For the most part, yes, with the exception of the omission of details concerning the YKFP and SRFB funded projects. comment here		Partial 2
II.C.4	For each management program (or project where not clearly part of an overarching management program), does the inventory summarize accomplishments/failures of activity	

<sup>6</sup> Among other programs, the Technical Guide requested for artificial production programs that the inventory include and summarize relevant HGMPs (both BPA-funded and non-BPA funded programs) and Council APRE evaluations?

<p>Reviewers: More specific quantitative information, such as fish numbers or area of habitat, should have been provided on this subject. The assessment of success/benefits is very general, making it very difficult to judge which projects are best and which are less effective. Again, details concerning the YKFP should be included.</p> <p>Although the plan presents existing protections, plans, and programs, it could do a better job of evaluating which ones are more likely to be effective and why, as well as which ones need improvement or more complete demonstration of effectiveness. Without this level of detail, there is no way to discriminate among the huge number of potential projects. Surely they cannot all be equally likely to succeed or equally likely to produce incremental movement toward the broader goals of the program. When and where will these levels of discrimination and evaluation be introduced into the process? Although this detailed evaluation might not be appropriate for the Inventory section of the plan, it does need to be included somewhere, or these plans will offer little guidance relative to the difficult funding decisions that lie ahead.</p> <p>comment here</p>	<p>Partial</p>	<p>2</p>
<p>II.C.5</p>	<p>Does the inventory relate the assessment to the existing activities and identify the gaps between actions that have already been taken or are underway and additional actions that are needed to address the limiting factors and meet recovery and other goals, and identify inadequacies in both design and implementation?</p>	
<p>Reviewers: Full marks for the design and effort that this subbasin has invested in this question. The gap analysis was innovative and proactive. The effort could be made a bit more understandable by providing tables of key words that link the Assessment Key Findings and the Inventory, but these are issues of how to present the gap analysis. Specific recovery goals under the ESA are not adequately covered.</p>	<p>Yes</p>	<p>2</p>
	<p><b>Overall impression and evaluation of the Inventory:</b> As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional information or analysis beyond what is laid out above in the checklist please (e.g., socio-economic descriptions or analysis).</p>	

<p>Reviewers: Although the Inventory represents a lot of excellent work including a well thought out strategy to relate projects to assessment findings, there are several significant items that need further treatment to make the Inventory most useful. Most notably, a comprehensive description of the YKFP and its relationship to the subbasin needs to be provided; i.e., the YKFP needs to be summarized and synthesized from the appendices. A more thorough description of projects being supported by the Washington SRFB and how these projects address problems identified in the assessment also should be included. The inventory of restoration programs is quite general. There is little or no specific description of effectiveness of past actions. Completing this would greatly increase the ability of plan users to make informed decisions about what kind of projects should continue, what kinds should end, and what new project types are needed to accomplish the stated goals. More specific detail would help identify gaps or future needs. The value of the gap analysis depends on the limiting factor analysis having been done (in the Assessment) correctly and appropriately, which is not clear. (See Editorial and Other Specific Comments below the checklist for additional detailed comments on the Inventory.) comment here</p>	<p>Partial</p>	<p>2</p>
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<p><b>III. The Management Plan</b>  <i>(Derived from pages 12-16 of the Technical Guide.)</i>  <i>Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin management plan.</i></p> <p>These checklist tables incorporate Council Question 4, Consistency with the Provincial- and Basin-level Program: Are the vision, objectives, and strategies proposed in the subbasin management plan consistent with those adopted in the program for the province and/or basin levels? This is a three-part question and reviewers must be familiar with the vision, objectives, and strategies described in the 2000 Fish and Wildlife Program (pp. 13-33) and, for mainstem subbasin plans, the Mainstem Amendments (pp.11-28).</p>		
<p><b>III.A. The Vision for the Subbasin</b>  Does the Vision Section of the Management Plan 1) describe the desired future condition for the subbasin; 2) describe a vision that will drive development of the biological objectives and thereby the strategies that are incorporated to change conditions within the subbasin; and 3) incorporate the conditions, values and priorities of the subbasin in a manner that is consistent with the Vision described in the Council’s 2000 Fish and Wildlife Program? (Council Question 4 to the ISRP):</p>	<p>(Y)es, (P)artial, (N)o</p>	<p><i>Need for additional treatment (0-4)</i></p>

<p>Reviewers: The vision statement is nicely worded and provides a general description of a future condition for the subbasin. In this respect it is similar to the Council's vision statement in the Fish and Wildlife program, which describes "...an ecosystem that sustains an abundant, productive, and diverse community of fish and wildlife, mitigating across the basin for the adverse effects to fish and wildlife caused by the development and operation of the hydrosystem and valued by the people of the region." The Yakima Plan makes no mention of the development and operation of the hydrosystem. The vision statement in the Yakima Plan is a set of principles to be used in deciding among strategies that are presented in tables associated with specified objectives. The strategies, in effect, are listed as options. The choice of options will take place according to the principles listed in the vision statement. It would help to clarify this point. Does this model of activity allow for different levels and kinds of standards and objectives and criteria in different places within the subwatershed? Does it allow for the equivalent of designated uses and different standards (see these concepts in the Clean Water Act implementation requirements) for different segments of the basin?comment here</p>	<p>Yes</p>	<p>0</p>
<p><b>III.B. Biological Objectives</b></p> <p>Does the Biological Objectives Section of the Management Plan describe physical and biological changes within the subbasin needed to achieve the vision?</p>		

<p>Reviewers: This section was organized a bit differently from other subbasin plans, with objectives not listed in their own section. The objectives were presented in a single very large table with a lot of other information. Basically, the table relates Key Findings, Hypotheses, Objectives, and Strategies. However, the tables lack extensive discussion of objectives.</p> <p>This organizational structure needs to be improved to make the plan more useful. It took a lot of examination of the tables to figure out the plan; i.e., reviewers had to scour the appendices, Assessment, and Management Plan to find needed information. The tables could be summarized and much better organized. With a few hundred findings and more strategies, these tables provide a means to condense information "so that a logic path from Key Findings to strategies can be discerned ..." (page 4-5). The conceptual framework should be applied to the prioritization effort. As is, the tables are vague and unfocused and provide inadequate guidance for future project sponsors, reviewers, and decision makers.</p> <p>To improve the plan, definitive biological goals should be stated. These goals should include both narrative and numeric statements that relate to the biology of these places. In some cases, those goals (or minimum standards) could be expressed in the language of focal species, but in other cases they should be expressed in broader biological contexts and in broader biological terms. These should be stated as explicitly as possible and must go beyond harvestable populations, as one common example. One cannot use that as a guide because it is too vague.</p>	<p>Partial</p>	<p>3</p>
<p>III.B.1. Are the biological objectives consistent with basin-level visions, objectives, and strategies adopted in the program? (Council Question 4) The 2000 Fish and Wildlife Program, pages 16-18, provides general descriptions for basin-level goals, objectives, and strategies. The Mainstem Amendments provide additional biological objectives as well on pages 11-14.<sup>7</sup></p>		
<p>Reviewers: Consistent, at least for the most part. But they remain so vague as to be impossible to understand if and when they are actually being accomplished. comment here</p>	<p>Yes</p>	<p>0</p>
<p>III.B.2. Are the biological objectives based on the subbasin assessment? (This question relates to the Logic Path in the subbasin plan. Question III.C.1 is a similar question for the Strategies Section.)</p>		

<sup>7</sup> Given the Fish and Wildlife Program's emphasis on building from subbasin level management plans upward into provincial and basin level objectives, reviewers should evaluate whether the plans have a framework that will facilitate the development and linkage of objectives from the subbasin to the province to the basin.

<p>Reviewers: The connection from the Assessment to the objectives is made by extracting the “Key Findings” from the Assessment and providing associated objectives for each. Although from a process standpoint this approach was mostly adequate, the scientific basis for the connection from the Assessment to the objectives sometimes was unclear. For example, objectives for Marion Drain chinook and kelt reconditioning, do not tie back into the Assessment and in fact are not covered in the Assessment. Although kelt reconditioning is listed as a main protection strategy, there are numerous scientific uncertainties associated with this strategy that are not addressed in the Assessment. In addition, there is no real indication of the benefits expected from the reconditioning. Without some statement of expectations, there is no way to assess the success of the program. A process needs to be in place to explore its effectiveness or whether other activities might be more effective.</p> <p>A similar lack of connection between the Assessment and objectives can be seen relative to steelhead supplementation. Following their own logic path, the Assessment does not directly indicate that steelhead supplementation is an appropriate strategy. There are scientific uncertainties associated with supplementation (see ISAB report: <a href="http://www.nwcouncil.org/library/isab/isab2003-3.htm">www.nwcouncil.org/library/isab/isab2003-3.htm</a>) that should be thoroughly addressed in the Assessment before pursuing the strategy of steelhead supplementation. This is an excellent example of the issue raised above about the long history of standard approaches and past thinking that is likely to lead to the same kinds of narrow conceptual mistakes that have limited success in the past.</p>	Partia	3
<p>III.B.3. Where possible, are the biological objectives empirically measurable and based on an explicit scientific rationale; i.e., quantitative with measurable outcomes?</p>		
<p>Reviewers: The plan should give more attention to this point, particularly the quantitative aspect of it. The table in the Management Plan includes a mix of objectives from specific to broad and general. For many of the specific objectives, success could be determined empirically. The plan neglects to define some measure of success and link to the M and E plan. Currently, this is a major gap in the plan that is not adequately dealt with at a level that will provide any decision-maker, scientist, or manager with the ability to know whether the plan is working or not.</p> <p>One example is the coho salmon reintroduction project that is described as a pilot or test of feasibility. No criteria, however, are given for deciding when it might be appropriate to move to full-scale efforts nor to define the success or failure of reintroduction, and hence, when to discontinue efforts. It ought to be possible to specify some reasonable number of spawners or smolts that would be reflective of success. Those measures of success should carry through a life cycle to show that they are really having an effect on the population.</p>	No	4
<p>III.B.4. Are biological objectives identified for both the short and long-term?</p>		

Reviewers: This was not always done explicitly. It was not even implicitly done in any but very vague language. This varies across objectives, but some have short-term goals and others will require more time comment here	Partial	3
III.B.5. Are the biological objectives complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin?		
Reviewers: No direct ties are presented, but the objectives appear consistent; e.g., they were developed in conjunction with these staffs and programs. In addition, the objectives suffer from some of the vagueness issues already raised several times in these comments.	Yes	0
III.B.6. <i>Clean Water Act</i> : Does the management plan describe how the objectives and strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule within that particular state? I.e., does this subsection of the management plan assess and describe the consistency-coordination-findings of the Water Quality Plan with the subbasin plan? <sup>8</sup>		
Reviewers: TMDL is one but not the only current context for CWA implementation in the state. Much is made of the goals of ESA in this plan, but much less attention is paid to coming into compliance with the broad goal of the CWA, i.e., "to restore and maintain the chemical, physical, and biological integrity of he nation's waters." More could be said on that, and it is important not to fall into the narrow traps that are now being used to implement TMDLs. It is especially important that the TMDL goals be linked explicitly with biological context as called for in a recent NRC report (National Research Council (NRC). 2001. <i>Assessing the TMDL Approach to Water Quality Management</i> . National Academy Press, Washington, DC.) and a paper in Journal of Environmental Engineering (Karr and Yoder 2004).  Page 3-5, 6: There are major flaws with the TMDL process from the efforts to define what are impaired water bodies and segments to the analytical process of resolving those problems.  Also, should it be CWA 1987 rather than 1977? The 1987 version was the most recent major reauthorization (outside the last decade of continuing resolution type reinstatements).	Yes	0

<sup>8</sup> *Clean Water Act*: The Water Quality Management Plans developed for watersheds within each state includes the following information: 1) Management measures tied to attainment of TMDL; 2) Timeline for implementation; 3) Timeline for attainment of Water Quality Standards; 4) Identification of responsible parties; 5) Reasonable assurance of implementation; and 6) Monitoring and evaluation. The status of Total Maximum Daily Loads (TMDLs) is generally the responsibility of the state, which is delegated the responsibility for implementing the CWA. Each state has a schedule for completing TMDLs, which include a Water Quality Management Plan that describes how the allocations in the TMDL will be met. Basic information on TMDL's can generally be found on the web (see Resources).

<p>III.B.7. <i>Endangered Species Act</i>: The USFWS and NOAA Fisheries are developing recovery plans for listed species (bull trout, white sturgeon, salmon). Recognizing that those ESA-based efforts are in various states of completion across the Columbia basin (some efforts are well underway, others just beginning), does the management plan describe how the objectives of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin?<sup>9</sup></p>		
<p>Reviewers: Although there is a separate section on this, if these goals are empirical, then this is not evident for each objective, nor is there any indication of input from TRTs. Insufficient discussion is provided both of the quantitative aspects of recovery and of the expected quantitative benefits of the strategies. comment here</p>	<p>Parti</p>	<p>2</p>
<p>III.B.8. If there are disagreements among co-managers that translate into differing biological objectives, are the differences and the alternative biological objectives fully presented? (The Council’s review will examine whether the plan is consistent with legal rights and obligations of fish and wildlife agencies and tribes with jurisdiction over fish and wildlife in the subbasin, and agreed upon by co-managers in the subbasin.)</p>		
<p>Reviewers: This topic is not presented. Although the vision statement outlines principles to be used to reconcile differences, differences are not identified. comment here</p>	<p>na</p>	<p>na</p>

### III. C. Strategies<sup>10</sup>

III.C.1. **Internal Consistency of the Plan.** Does the Strategies Section of the Management Plan explain the linkage of the strategies to the subbasin biological objectives, vision and the subbasin assessment? (Council Questions 2 and 3)<sup>11</sup>

<sup>9</sup> E.g. NOAA Fisheries has provided interim targets in a letter from NOAA Fisheries to the Council, Bob Lohn to Larry Cassidy: [http://www.nwcouncil.org/library/2002/nmfstargets2002\\_0404.pdf](http://www.nwcouncil.org/library/2002/nmfstargets2002_0404.pdf).

<sup>10</sup> *Definition*: Strategies are sets of actions to accomplish the biological objectives. Strategies are not projects but instead are the guidance for development of projects as part of the implementation plan. Strategies identified within the subbasin plans will be used as a basis for Council recommendations to the Bonneville Power Administration regarding project funding. Proposed measures will be evaluated for consistency with biological objectives and strategies. The strategies may be organized by categories of habitat, artificial production, harvest, hydrosystem passage and operations, and wildlife.

<sup>11</sup> This is one of the most important review questions. The set of seven questions from Council asks the ISRP to evaluate the internal consistency, scientific soundness, and thoroughness of subbasin plans. Internal consistency means there is scientific support for the conclusion that the strategies proposed in a subbasin plan will in fact address the problems identified by the subbasin assessment; i.e., does the Strategies Section take into account not only the desired outcomes, but also the physical and biological realities of the subbasin environment. The ISRP’s Subbasin Plan Logic Path flow chart, attached below, provides a straightforward illustration of the logic path reviewers should look for in subbasin plans. Rick Williams, ISRP chair, developed and has presented this flow chart to subbasin planners around the basin, emphasizing the importance that subbasin plans demonstrate a clear logic path.

<p>Reviewers: In general, although the strategies were based on conclusions from the Assessment, they were listed only in the huge table that constituted the management plan. As such, they were all fairly cryptic in their level of detail. Little explanation is given of the reason that any one strategy was chosen over others, and the logic behind some choices is not obvious at all, even being questionable in some circumstances (see below).</p> <p>The format looks linked, but adequate description of getting from point A in the Assessment to point B as a strategy is not provided. In addition, there were several strategies that did not appear to be linked back through the objectives, vision, and Assessment. Examples include the steelhead reconditioning project and steelhead supplementation, as discussed in the reviewers' response to III.B.2.</p> <p>Significantly, the major limiting factors/issues in the basin are not described in the detail warranted. For example, the flip-flop flow regime is included but all its components should be analyzed. In the plan, flow is not clearly defined in terms of specific flow parameters known to be biologically important. A normative flow project run by King County (WA) and a flow oriented restoration effort on the Kissimmee River in Florida (South Florida Water Management District) are two recent examples to do this in a more effective way.</p>	<p>Partial</p>	<p>4</p>
<p><b>III.C.2. Consistency with the Fish and Wildlife Program.</b> Are the Strategies proposed in the subbasin management plan consistent with those adopted in the program? (Council Question 4)</p>		
<p>Reviewers: It is likely that Fish and Wildlife Program strategies are consistent with the array of potential strategies possible within the basin, but the application of certain strategies to address some of the specific objectives is questionable. For example, in Table 3.4.1, Focal Species Populations, the second Key finding states that the range of spring Chinook has been reduced, and the working hypothesis for the cause of this reduction is that access to spawning habitat is physically limited due to barriers and that side channel rearing areas have been lost. The objective of proposed actions is to expand spring Chinook's range back to its former size. The number 1 strategy presented, however, is to continue the spring Chinook supplementation efforts of the YKFP. How does that restore the lost habitat? It follows no logical path, instead seeming to be more of a self-justification statement for supplementation, which continues to be billed as an "experiment".</p>	<p>Partial</p>	<p>3</p>
<p><b>III.C.3. Consideration of Alternative Management Responses.</b> Does the Strategies Section explain how and why the strategies presented were selected over other alternative strategies (e.g. passive restoration strategies v. intervention strategies)? (Council Question 5)<sup>12</sup></p>		

<sup>12</sup> The 2000 Fish and Wildlife Program directs that the subbasin management plan's strategy section must include an explanation of how and why the strategies presented were selected over other alternative strategies (e.g. passive restoration strategies v. intervention strategies). The Council does not expect subbasin plans to be structured like an Environmental Impact Statement with a list of alternative actions and descriptions of why each were not recommended. The Council's primary interest is on why and how a strategy was selected -- the rationale for the selected strategy -- which necessary includes some discussion of alternatives.

Reviewers: The plans lists a few alternatives, even bolding the preferred alternatives, but there was no explanation of how and why.	Partial	4
III.C.4. <b>Prioritization.</b> Does the Strategies Section describe a proposed sequence and prioritization of strategies?		
Reviewers: This was not done. There is no basis given for prioritization. Apparently, prioritization will be based on the principles presented at the outset of the Management Plan section. However, these principles are very general and it is not clear how they can be used to sort the vast array of strategies presented in the table. Much more emphasis should be placed on this component of the plan.comment here	No	4
III.C.5. <b>Additional Assessment Needs.</b> Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		
Reviewers: Key uncertainties or needs for more study are identified when appropriate; a new study is a strategy. Modeling is proposed as a need to better assess pre-1850s conditions as the baseline. Reviewer concerns with this approach to establishing objectives were stated above. In any case, more detail on expected outputs of the model would be helpful. comment here	Partial	2
III.C.6. <b>Clean Water Act:</b> Does the management plan describe how the strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule within that particular state?		
Reviewers: Although this is generally done, the plan fails to connect with aspects of the TMDL program focusing on selected water chemistry issues (contaminants) with their effects on the biota of the river. In addition, the plan fails to integrate that with the larger range of human actions that are in the aggregate responsible for the decline of fish populations and other changes in the biota of the river.	Yes	0
III.C.7. <b>Endangered Species Act:</b> Recognizing that ESA-based efforts are in various states of completion across the Columbia basin, does the management plan describe how the strategies of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin?		
Reviewers: Although there is a specific section on this, it is not specific enough to be able to relate possible effects of the plan's strategies to ESA-based goals.	Partial	2

### III.D. Research, Monitoring, and Evaluation

This RME Checklist Section provides the review elements necessary for the ISRP/ISAB to answer *Council Question 6. Plan for Assessing Progress toward Subbasin Goals*. The ISRP/ISAB is asked to determine whether a subbasin plan includes a procedure for assessing how well subbasin objectives are being met over time. This question focuses on accountability and self-assessment, and reflects on the adequacy of the Management Plan’s research, monitoring and evaluation component. This RME component needs to be closely connected to a limiting factors analysis and the biological and environmental objectives. A prioritized RME agenda reflecting the critical uncertainties and limiting factors should be developed and presented with the detail requested below (Technical Guide pp. 14-16). *NOTE: The focus of the RME component should be on the strategy level rather than individual project level.*

Subbasin planners were encouraged to incorporate, or link their RME framework and strategies with the “regional” RM&E strategies being developed by the Pacific Northwest Aquatic Monitoring Partnership and the Columbia Basin-Wide Research, Monitoring and Evaluation (RM&E) Program, a coordinated effort developed by State, Federal, and Tribal entities in response to the Basin-wide Salmon Recovery Strategy 2000 and the FCRPS 2000 Biological Opinion. Products from these regional RME efforts could be used to meet elements of a subbasin plan’s RME section (Technical Guide pp. 14-16), particularly in the areas of monitoring protocols and methodologies. The subbasin plan should also explain how they incorporated existing monitoring guidance from state programs.

III.D.1	<b>Research:</b> Does the RME section of the plan describe a research agenda with specific conditions and situations identified in the subbasin that will require specific research studies to help resolve management uncertainties? Is the research agenda framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties? Does the RME section prioritize research topics that are of critical importance to the subbasin?	<i>(Y)es, (P)artial, (N)o</i>	<i>Need for additional treatment (0-4)</i>
<p>Reviewers: Like other components of the Management Plan, the RME section does not provide clear guidance on what will be done and why or on how RME efforts will be based on the foregoing analysis and synthesis. Although there is much open-ended discussion with some ideas being proposed, its format is rough. A true research agenda is not obvious, and there is no prioritization given. The research topics are an array of issues identified through the planning process but some are being addressed by the YKFP, some are beginning to be addressed, and others are not. A mathematical modeling approach is proposed for assessment of past conditions and potential effects of past and future actions. The list is not prioritized, and no plan could be assumed from this text, perhaps because no individual strategies have been agreed upon.</p> <p>comment here</p>		Partial	3
III.D.2	<b>Monitoring Objectives:</b> Does the RME subsection identify what kind of information needs to be collected in order to determine if the plan’s vision and objectives are being met? I.e., what indicator variables will be monitored?		
<p>Reviewers: This was not done in a detailed way in the plan. A notable program in the subbasin is the YKFP M&amp;E program that has been extensively reviewed by the ISRP. While this is referred to in this text and is included as an appendix, there is no effort to describe a broader program to address all aspects of monitoring wildlife and fish in this plan.</p> <p>comment here</p>		Partial	4

III.D.3	<b>Monitoring Indicators:</b> Does the RME subsection identify measurable indicators of physical, chemical, biological, or socioeconomic conditions that may act as environmental signposts by which progress towards achieving the stated vision can be evaluated? E.g., does the RME subsection describe performance standards or quantitative benchmarks for reference conditions against which observations can be compared? Does the plan prioritize which indicators are most needed to answer management questions (include a short list)?		No	4
Reviewers: Monitoring indicators are not defined clearly in the plan. The plan fixes upon pre-1850s conditions and points to the lack of information needed to specify them, but information is not provided on how those conditions will be defined. Even if they could be defined, the use of pre-1850s conditions as a benchmark may not be appropriate comment here				
III.D.4	<b>Data and Information Archive:</b> Does the RME subsection describe an infrastructure to archive relevant data and meta data generated through monitoring efforts in existence for the subbasin (e.g., locally or at a regional Fish and Wildlife Program funded database such as StreamNet, the Fish Passage Center, or DART)? Specifically, does the RME subsection include discussion of quality assurance/quality control (QA/QC), data management and analysis, and data reporting?		Partial	2
Reviewers: The RME subsection identifies the Yakima Tribe as the repository for data to be accumulated, and as the archives for mathematical models that may be developed. Quality assurance/control and reporting are not discussed.comment here				
III.D.5	<b>Coordination and Implementation:</b> Does the RME subsection describe who will collect the information and data collection methods whether collection is done by a subbasin, provincial, state, or a regional entity, or a combination of entities? This should include a description of coordination with regional RME efforts in the basin (Regional Partnership, Action Agencies Research, Monitoring, and Evaluation Plan, etc) with standardization of data methods. It should also include estimates of how much the proposed M and E will cost.		Partial	2
Reviewers: The plan's Section 5, Plan and strategy implementation and effectiveness monitoring, covers this question in a very general sense, but no specifics are provided. Estimates of cost for the RME effort are not provided.comment here				
III.D.6	<b>Summary Question. RME Logic Path (Evaluation and Adaptive Management):</b> Does the subbasin plan provide a scientifically supportable procedure for refining the biological objectives as new information becomes available about how fish, wildlife, and the environment interact, and in relationship to how the plans are implemented over time? (Council Question 7) Specifically, does the RME subsection describe a scientifically sound logic path for how to test if the subbasin plan's strategies are helping to reach the stated vision and objectives? I.e., Is the RME agenda adequately framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties?		No	3
Reviewers: The RME component of the plan needs significant work to capitalize on the good overall effort in the Assessment and Inventory. The RME logic path could be improved. Constructing an effective RME proposal for the diversity of issues and size of this basin will be a daunting task, but some effort needs to be expended, or at a minimum, a few examples need to be presented. The ISRP is aware that the YKFP is capable of developing a large-scale RME program, but the subbasin will need to work together to develop an overall plan for that activity.comment here				

	<p><b>Overall impression and evaluation of the Management Plan:</b>  As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please (e.g., socio-economic descriptions or analysis).</p>
<p>Reviewers: Much work and energy were put into producing the Assessment and Inventory, but it appears by the time the Management Plan component was reached, time or energy were exhausted. To constitute a plan that meets the scientific elements of the Council's program and technical guide, more work needs to be done in the Management Plan by using information from the Inventory and Assessment to prioritize objectives and strategies with documentation of linkages and rationales.</p> <p>The Management Plan is not as well organized or as complete as the Assessment or the Inventory. Its organizational structure is more difficult to follow, and the RME portion is under developed. More work is needed to bring the Management Plan to the level of the first two parts. The huge table serves as the sole explanation of the proposed management plan, is not reader friendly, and consequently is not very usable. Beyond basic usability issues, there is little sense given of what are the most important aspects. The management plan contains insufficient synthesis. The strategies are vague and not prioritized. Little explanation is given for the reason that a given strategy was chosen over another, and the logic behind some choices was not obvious at all, even being questionable in some circumstances.</p> <p>Beyond that, there are some credibility issues that come out in the key findings portion of the plan. For example, for spring Chinook, one states that "Increases in abundance of spring Chinook as a result of the supplementation at CRESF that have allowed tribal and sport harvest...." Is it an accepted fact that the increases in returns over the last few years are due to supplementation successes? What is the evidence to support that conclusion? What is the role of improved ocean conditions, and what do the relative increases of wild versus hatchery returning adults tell us? It is the reviewers' impression that there is a bit of an overstatement involved with the articulation of this key finding (and others), one that brings up overarching credibility issues. This portion of the plan seems at times like a strategy designed to justify past, current, and future artificial production activities.</p> <p>Another strategy struck reviewers as being somewhat inconsistent with the objective. For the objective of reducing populations of smallmouth bass, the proposed strategy is to continue or expand the bag limits. How would continuing the same bag limits accomplish a reduction? Catch would be expected to increase but would recruitment be effected? This can not be assumed.</p> <p>Similarly, for the objective of reintroducing sockeye salmon into Lake Cle Elum the proposed strategy is to continue the Bureau of</p>	<p>Partial</p> <p>3</p>

<p>Reclamation study. Obviously, a more complete description is needed.</p> <p>In addition, there really is no formal coverage of the YKFP and its relationship to any subbasin plans - other than what is presented in Appendix J. Although that portion of the document does have some interesting and informative parts to it, how it actually relates to the subbasin plan is not explicitly stated.</p> <p>In fact, much of what is presented in Appendix J is from a document that must have been produced in 2000-01, with no current updating. Because it mentions a number of projects that are presumably underway, it is disappointing not to have had the information produced by those projects over the last few years included in this document. For example, there were studies listed that presumably have been comparing the behavioral, morphological, and physiological characteristics of hatchery vs. wild salmon. What has been found, i.e., were there differences? If there were differences found, what then is the future of the supplementation programs? In addition, there are some clear questions regarding design issues that need answers; e.g., several components of the domestication experiment need clarification and possibly revision. Statements like "no HC [hatchery control] fish will be allowed to spawn in the wild" should be reworded (what if these fish stray to anywhere outside of the basin?), the genetic variation portion is quite open ended (what are baseline results telling us about the feasibility of this approach). This entire Appendix should be updated and fully integrated into the subbasin plan.</p> <p>The text needs more careful proofreading before it would be adopted as an amendment to the FWP. Citations to references are incomplete in several places in the text. (e.g., "Quackenbush", "Aquarella", and others.)</p> <p>(See Editorial and Other Specific Comments below the checklist for additional detailed comments on the Management Plan.)</p>		
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**General Council Question. Consistency with the Fish and Wildlife Program and its Scientific Foundation**

The Council asks the ISRP to evaluate a subbasin plan for its consistency with the Scientific Foundation adopted as part of the Program and with the requirements for "biological objectives" as described in the program. The core of the Council's Scientific Foundation is a set of 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.

*See 2000 Fish and Wildlife Program, pages 14-15 for full detail.*

Questions on consistency with the objectives and strategies section of the Fish and Wildlife Program are incorporated in the table above. Consistency with the Program’s scientific foundation is interwoven throughout the checklist, and this comment table provides reviewers a place to specifically summarize and identify how well the eight principles were addressed.

**Summary comments and evaluation of the subbasin plan’s consistency with the eight principles of the Fish and Wildlife Program’s Scientific Foundation:**

<p>Reviewers: The Assessment and the Inventory sections were excellent and consistent with the eight principles. These principles are inherent in material presented and several of the guiding principles in the Management Plan are similar in wording to these. The Management Plan, however, fell short, particularly the RME portion. There is a clear need to pick focal species that serve the assessment process well, not just some favored species. There is a clear need to have an open and full treatment of the YKFP in this subbasin plan; until it is included this plan fails to cover subbasin activities thoroughly.</p> <p>In general, it would be useful for the planning teams to consider and make explicit how they have been influenced in their deliberations by this set of overarching principles. What projects and programs that are active now acknowledge the importance of these principles and are in line with these principles? Which ones are not? The planning teams should have to evaluate themselves initially, and then make their final recommendations fit these principles. This process should include explicit text that shows how and where they have applied those principles in their planning and program development. If this was done by the planning teams as part of their activities, they would discover some of the inconsistencies that we have tried to outline.</p> <p>The following specific points coded to pages in the document relate to these issues:</p> <p>3-19, 20: Why is there a difference between goals and objectives? The goals have biological accomplishments as the targets, whereas the objectives are all about habitat, not about the biological endpoints. The reviewers believe that in the end the goals must be biological.</p> <p>3-41: The categorization that combines planning and assessment is very poor. It mixes very different activities in ways that make it impossible to distinguish important factors and issues.</p> <p>3- 50: The document notes that there is a lack of methods available to assess implementation success. Considering the amount that is being spent on these issues, that shortcoming is alarming. What is being done in this effort to resolve that problem?</p> <p>4-4: To understand the health of the system, biologists should not</p>	<p>Partial</p>	<p>1</p>
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<p>monitor programs and actions, they should monitor the river biota to determine its response.</p> <p>4-5: Again, there is a disconnect between goals, objectives, and strategies with respect to the role of biology.</p> <p>4-26: The suggestion here that water will be found somewhere outside of the subbasin needs substantiation. How many other subbasin plans in this largely dry region are suggesting that they will find water outside of their subbasin? How many are going to be able to provide water, and how many are planning to receive water from outside? comment here</p>		
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## Editorial and Other Specific Review Comments

2-44: Sandhill Crane is not the only North American crane. Whooping Crane is the other.

### Chapter 2. Assessment:

Section 1.2 Guiding Principles: This section is a good effort to describe a conceptual foundation and principles to guide restoration in the subbasin, but like many such lists, the list becomes repetitive and some of the later principles do not seem to be written as principles. Sections such as these can be useful but if excessive can become daunting for any planner to uses. It is important then, for this effort to be useful, that the principles are each unique, clearly written, and that they do provide a guiding principle.

For example:

- a) Principles 1-6 seem well written and state principles,
- b) Principle 7 seems to be an observation and four examples, but what is to be applied or taken as a principle? There could very well be a principle in this idea, but it is not clear, nor is there any real evidence presented to support this principle.
- c) Principles 8 and 10 seem very similar and the split between aquatic and terrestrial implies a difference. Couldn't these be combined into one clear statement?
- d) Principle 9 is another observation or statement. The way this idea is used in the plan seems to be more of an implementation strategy than a principle.
- e) Principle 12 is not written as a principle, and what is intended by the principle is unclear.
- f) Principle 15 may not be true. Does "state" refer to its habitat or its numerical status? If one population is isolated from all others, or the only remaining, then even a pristine habitat may not protect an isolated and small population, which seems to be Principle 16. The point for Principle 15 may be that there is higher protection value in identifying remnant or core populations as they have potential for restoration.

Many of these principles are sound ideas, but an edit of them to ensure clarity and uniqueness is advised.

Spring chinook age-at-returns (Section 6.3.2, page 2-159), Table 2-13: This table is not adequately documented. While data are reported from 1986-2003 return years, it is not documented clearly what the data in this table are. Are the data based on estimating the composition by sex and age within years and then averaging over years? The appropriate age data for this section would be age of return by sex from each spawning year, but the text is not clear on what is presented. Also, why is the sex ratio consistently and strongly biased to females? How were the samples collected and, if by carcass sampling, was there any effort to correct for the bias in carcass recovery (see Zhou paper in AFS). The time series also involves the recent years of increased returns from Cle Elum hatchery. Were the hatchery returns excluded from this data?

Spring chinook, Key Uncertainties (page 2-169): It is not clear at all why these three statements are the Key Uncertainties? The third statement may be as it is a restatement of a principle reason for the Cle Elum project. The first though implies some intention of stopping supplementation. The ISRP has never been informed of an agreement about when to terminate supplementation, so what is the source of this uncertainty? The second statement is not clear on what is the uncertainty? The supplementation seems to be indicating benefits in that there are spawning chinook. It is understandable that their success is not well understood at this time. Is the issue whether the supplementation program should be selecting brood stock from returns to the release streams, as opposed to the mainstem Yakima?

Surely one of the Key Uncertainties would be the survival of naturally produced smolts in the lower Yakima River. If supplementation is intended to restore natural production, then downstream limiting factors may be critical?

Fall chinook, Run Timing (page 2-175): the dates in the first paragraph of this section seem incorrect, check.

Fall chinook, Key Findings (page 2-179): It is difficult to see that these are the key findings, how could the extraordinary age-structure of the Marion Drain chinook not be notable? And why are there no Key Uncertainties for Fall Chinook? The downstream “window” and the effect of this thermal regime would be very important for the plan’s subsequent discussion about restoration.

Sections 6.3.6 Sockeye salmon and section 6.3.7 Pacific lamprey: It is the prerogative of the planners to identify focal species and their monitoring plans, but these two species seem to stretch the choice of focal species. One is extirpated and the other has not data. The species could still be important culturally for restoration but the sockeye re-introduction is very long term in outlook, and the lamprey needs some basic data before anything can be said about their ecological value. If they are identified as focal species, then appropriate monitoring programs should also be developed.

Section 6.4 Fish Habitat and Environmental/Ecosystem Attributes: This is a very informative section and contains a good explanation of the “flip flop” in river flow seasonally. Two minor comments on the section:

- a) Figures 68 to 72, while informative, seem to be out of context since the EDT analysis has not yet been discussed in the flow of the text (these figures have no captions and are not referred to in the text); and
- b) the first bullet under Key Uncertainties (page 2-248) seems to be important to have captured, but it does not materialize again in the EDT discussions. Certainly for completeness, some discussion of this should be included in the later EDT text.

Section 6.5 Yakima Subbasin Assessment Units: A very helpful addition to this text would be a very clear map (i.e., minimize use of color contrast as it is not too distinctive in these pdf files) that includes all locations and features that are important to description of these Assessment Units (including location of the irrigation canals). It is possible that two maps would be needed for clarity: river and features, and a second by with human alterations imposed (i.e., the drainage canals, each dam structure, etc.).

Section 6.5 Yakima subbasin assessment units is very detailed and includes summary of key findings and uncertainties after each unit. However, there is some notable overlap between assessment units, and a summary of this section would be very useful given its information context. A suggestion would be to collate these summaries after the text so that readers can compare these findings. In the lower assessment units, the results suggest that the EDT model hypothesizes increased susceptibility to pathogens and increased competition between hatchery and naturally produced fish. While these results may be indicated due to the rule set applied in EDT, is there any empirical evidence for either of these factors occurring? One important finding in the Mid Elevation Yakima unit was identification of potential smolt and kelt passage problems at Roza Dam. However, the text refers to steelhead smolts and kelts, but does not refer to spring chinook smolts that could be of comparable size to the steelhead smolts and could have similar emigration timing. Why would the spring chinook not be a concern -- due to their migration into the lower river in the fall/winter?

One graphic problem occurs in Figure 2-76 with a caption that refers to the average historical flows but these are not evident in the figure (but they are in other figures).

Section 7 Out of Subbasin Effects (OOSE): Since this is largely the work of another group, detailed comments are not provided here. With the exception of Section 7.1.10 Conclusions, a summary written by these authors.

1<sup>st</sup> sentence, page 2-379: *“While the document above lays out the effects of the hydrosystem on survival, it does not lay out the effect of other conditions in the mainstem (hatcheries, harvest, or estuarine habitat quality and quantity) below Bonneville. This is significant from the standpoint that post Bonneville mortality due to the supposed combination hatchery and harvest effects is significant (i.e. over 20 percent for Yakima Subbasin spring Chinook). ...”*

It is not apparent what the authors mean by “lay out the effect of other conditions.” The material presented includes comparisons of SAR’s from “intermediate EDT results” (which are not presented, page 2-374) and compared them with estimates based on coded-wire tag data and run reconstructions by C. Petrosky. The text would indicate that the other conditions were considered in these analyses and so this concluding statement would be incorrect, if understood correctly. However, the authors should clarify whether they mean the assumptions and values applied were

not adequately documented, or that they were actually not included in the estimates? The latter would seem to be incorrect based on the write-up in Section 7.1.

Section 8.1, page 2-379, 1<sup>st</sup> paragraph:

*“The EDT method was designed to provide a practical, science-based approach for developing and implementing watershed plans. The method provides decision makers with the technical information needed to develop plans that will achieve their goals. EDT has been used to develop fish and wildlife plans for many watersheds throughout the Pacific Northwest.”*

While the intent of this paragraph is certainly how people think of EDT, it does over-state what EDT should be used for (underlined text in quote). EDT is a scientifically based tool that allows the development of hypotheses concerning what limits production capacity and should really be considered a means to identify “experiments” about how to achieve goals. In most applications, the majority of data used in an EDT analysis is not even based on local empirical data. EDT should be a useful learning tool, and it does force planners to organize their data and collective wisdom about their watershed, but the results are only relative (i.e., one condition scenario versus another) and predictive of what actions might best benefit a subbasin. An important feature of EDT is that each scenario is essentially a database record of what was tested in the model and, therefore, what planners based their recommendations on.

### **Chapter 3. Inventory**

Section 2.1.1 (page 3-4), Sub-title: the sub-title should be omitted since the text underneath involves more than just the Pacific Salmon Treaty.

The authors made a significant effort to document the programs and projects conducted in the Yakima subbasin, and to provide summary graphics by project types (pie diagrams) and maps of aquatic project locations. Their method of using an Access database and key words is one of the few creative data summarization tools evident in these subbasin plans. Unfortunately, the final link between the key findings/uncertainties in the Assessment and how the projects align against them was not as well addressed. Table 3-2 (page 3-40) relates the projects to the Level 2 EDT attributes, but the table is not well described in text or a caption (e.g., what are the Priority levels to indicate?). Section 4 then summarizes the key findings using similar categories as used in the previous section on projects, and then superimposes (using GIS mapping) the location of projects from the inventory and findings from the Assessment. However, the focus of the gap analysis should be to identify the omissions and not how similar the portions of projects are etc. The authors are aware of this difficulty, as stated in their opening of Section 4.1 (page 3-50):

*“Due to the lack of consistent methods to assess implementation success and the lack of defined benchmarks to define subbasin-specific objective “measuring sticks”, only broad generalizations regarding the effectiveness of current activities can be given in this iteration of Subbasin Planning. It appears that, with some the exceptions, the proportions of project types implemented generally matches the proportion of limiting factors.”*

Possibly a more suitable method to summarize what is a large set of data would have been a table by assessment unit, key findings/uncertainty, and the project categories conducted within each unit. The table could also provide comment on benefits if documented and could provide a

simple scoring of whether an uncertainty or restoration opportunity was being addressed. The other key feature of a table could be a “consensus” ranking of the potential benefits if key omissions were addressed.

Overall, the inventory was the most informative that I reviewed.

#### **Chapter 4 Management Plan:**

Page 4-3, 1<sup>st</sup> para, 3<sup>rd</sup> line: does the reference to a 2002 Board vision refer to an earlier vision, or is this a typo referring to the Vision below?

Section 1.1.2; page 4-4 Guiding Principles: How do these principles relate to the principles in the conceptual foundation in the Assessment (Chapter 2)? Presumably, these principles related to agreements needed to achieve a consensus Vision statement, but should there be two sets of principles or should they be incorporated in the conceptual foundation also?

Section 5, page 4-79, Plan and Strategy for Monitoring ...

For such a large subbasin and its experience under the YKFP, the statement in this section concerning M&E (copied below), is rather simplistic and financially is likely unrealistic -- although it is a good statement on intentions, use of common protocols, and coordination. The YKFP project for RM&E just for the spring chinook supplementation program is millions of dollars per year. Planners gain little by suggesting the subbasin can monitor, analyze, and report on everything. More effort is clearly needed to develop a realistic M&E plan for such a complex basin.

*“The YSPB recommends that the Subbasin Plan and strategies be monitored using the Washington Salmon Recovery Funding Board protocols Field Sampling Protocols for Effectiveness Monitoring of Habitat Restoration and Acquisition Projects. Each project sponsor should be required to collect data on project effectiveness as a condition of receiving project implementation funding. Collection and analysis of this data should be performed by a central entity funded by BPA/NPCC for purposes of monitoring, coordination and reporting ...”*

## **Selected References**

Selected presentations of and references to the five-factor diagram for analysis of how human actions influence river biological condition:

Karr, J. R. and D. R. Dudley. 1981. Ecological perspective on water quality goals. *Environmental Management* 5:55-68.

Karr, J. R., K. D. Fausch, P. L. Angermeier, P. R. Yant, and I. J. Schlosser. 1986. Assessment of Biological Integrity in Running Water: A Method and its Rationale. Illinois Natural History Survey Special Publication No. 5. Champaign, IL. 28 pp.

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