Okanogan

Review Summary

The Okanogan Subbasin Plan indicates significant effort in development of the introductory material, collation of aquatic habitat data for EDT, summarization of EDT results, and initial efforts at completion of the Inventory and Management Plan. However, as the report acknowledges, the Plan is incomplete -- specifically the Inventory and Terrestrial RM&E sections are incomplete -- and consensus has not be reached on the Management Plan or the related aquatic monitoring and evaluation program. Consequently, the Plan does not substantially meet all the scientific elements for a subbasin plan called for in the Council's 2000 Fish and Wildlife Program and the Subbasin Planning Technical Guide.

If comments on the level of community support and involvement are accurate, the incomplete portions of the Plan can likely be accomplished, but there remains significant work to complete this. Of concern from a scientific perspective is an apparent disconnect between the founding principles and assumptions and the extensive discussion of the role of hatchery supplementation for spring and summer/fall chinook and summer steelhead. While reviewers recognize the importance of short-term harvest opportunities to these communities, the balance between restoration of natural populations and their habitats and the desire for harvest is not evenly presented through this plan. While there is reference to the desire for summer/fall chinook and steelhead harvest, the mainstem harvest of sockeye salmon is not even commented on in this Plan. Yet, the harvest of sockeye salmon in the Okanogan may be one of the most achievable objectives in the short-term.

In terms of usability, the Plan has been poorly edited and there are many sections that are repetitive. The Plan contains figures, tables, and appendices that are incorrectly numbered and/or have inaccurate captions. The plan includes maps and text that have been inserted from the Methow subbasin plan. The final plan must be very carefully edited, as the corrections are too extensive to expect reviewers to capture all of them.

In its present form, this Plan does not constitute an adequate technical basis for subbasin planning but extensive groundwork has obviously been laid for development of a more complete plan. The imbalance between what is achievable with sockeye salmon and what may be desired with other species, but is much more difficult and expensive, is an obvious issue in consideration of priority actions. Many sections of the plan refer specifically to Chinook salmon and steelhead but do not even discuss sockeye salmon. Although the inability to apply EDT to sockeye salmon may well have been a contributing factor, the plan could better address sockeye salmon.

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.

I. A. Subbasin Overview

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. A.1. General Description		*(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: The Assessment provides an adequate orientation to the subbasin.		Yes	0
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: The Assessment adequately provides a general description of the subbasin's macro-environment.		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: The Assessment adequately provides a general description of anthropogenic disturbances.		Yes	0
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 provides a list of species that are threatened or endangered under the ESA, recognized as especially rare or significant, and it lists those that are not native to the subbasin. It does not provide a list of species that have any unique significance for American Indians or special ecological importance to the subbasin. Consideration of the listed salmonids indicates that they are a minor consideration in the ESUs in that ecoprovince, but it is not clear if there is significant opportunity for restoration of these species in available habitats.		Partial	2
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: The Assessment does not adequately identify plants that have any special significance to the subbasin. Adding such a list, or stating that this information is not available, will increase the efficacy of the subbasin plan.		No	2
I.A.2. Subbasin in the Regional Context		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
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: The Assessment adequately places the subbasin within its regional context.		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.[1]) where this information was available during the planning process?		
Reviewers: The Assessment adequately describes the subbasin's relationship to the ESA.		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)?		
Reviewers: More details would augment this portion of the plan.		Partial	2
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: The Assessment adequately identifies future trends.		Yes	0

[1] 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.)

	Summary comments and evaluation on the Subbasin Overview: Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin?		
Reviewers: In general, the introductory material is well presented, but there are some significant limitations. First, given the arid nature of this region, the discussion of water resources and issues within the Canadian and US portions of this subbasin could have been improved had the plan included a much greater emphasis on water management, current conditions, and availability and future pressures/opportunities for water management. The lists of native and non-native species are well presented but there is little identification of special ecological or American Indian cultural significance. Some of this could be assumed from the text but it is not specifically identified. Making this information clearer would enhance the text. Species lists are much better for fish and wildlife than for terrestrial and aquatic plants, the vegetation coverage is generally more inadequately done. The plan addresses out-of-subbasin effects on aquatic species very generally in several portions of the plan, but more thoughtful linkage to a long-term plan would improve the assessment. For instance, there is no comment at all on the out-of-basin harvest of sockeye salmon, no reference to publications linking ocean climate change with local climate changes and expected conditions, and surprisingly little effort to link conditions in Canada (especially for water flows) and the needs in the US. There is very little attention to trend assessments and expected future conditions, for example in human population growth, water use, etc. This latter is significant to a long-term planning document, so adding it would maximize this plan's utility. Out-of-subbasin effects on terrestrial focal species are not adequately considered.		Yes	2

I.B. Species Characterization and Status *General question: Does the assessment adequately describe the current status of fish and wildlife focal species?* 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,[2] and c) cultural significance.		
Reviewers: Please see summary comment in the green field below.	Partial	2
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?		
Reviewers: Please see summary comment in the green field below.	Partial	2
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)?		
Reviewers: This plan does an adequate job of describing the current and historic status of aquatic focal species.	Yes	0
I.B.4. Does the assessment describe the population's life history, including identifying distinct life stages?		
Reviewers: Please see summary comment in the green field below.	Partial	2
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?		
Reviewers: Please see summary comment in the green field below.	Partial	2
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?		
Reviewers: Please see summary comment in the green field below.	Partial	3
Summary comments and evaluation on the Species Characterization and Status Subsection: Does the assessment adequately describe the current status of fish and wildlife focal species?		
Reviewers: The authors identify focal terrestrial and aquatic species, but the plan's utility would be improved by having each section presented more clearly and by increasing the consistency between different sections. Some of the focal species selected will be very difficult to monitor, because they are not abundant and data quality is very limited. Assessments of the available data on focal species are highly variable, but the planners were dealing with limited information, so this is not unexpected. The assessments would be improved by identifying what the critical information needs are and what confidence there is in the existing data. The discussion of introductions and artificial production for aquatic species is spread throughout the text and involves very little true assessment; there are no comments on hatchery versus natural population interactions, but then there is very little information on the natural	Partial	2

[2] 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.

populations, with the exception of sockeye that are all natural. Consideration of harvest of aquatic species is quite limited but then the effect of harvest is likely less for this subbasin. The obvious exception though is the lack of any consideration of out-of-basin sockeye harvest. Harvest of terrestrial species is not discussed. Including this information is important to maximize the efficacy of this plan. Consideration of distinct populations, life history, and genetic integrity of aquatic species relied largely on the ESA assessments, which is likely adequate given the limited information for this subbasin. The "partial" for life history indicates that very little general information is provided on 1) juvenile use in the basin and 2) important life history features that should be recognized for future management. For population status, the authors made an effort for each salmonid species but not as complete of an effort for wildlife species, but these assessments are seriously limited by lack of data. Consideration of historical status is likely adequate since the data are limited, and the habitats are highly disturbed. There is little point in trying to recreate history based on no data. However, no effort was presented to identify recovery reference conditions. It may well be that the authors presumed this would be addressed by the TRTs, but this would only address the fish species.		

I.C. Environmental Conditions *General question to be addressed: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?*			
I.C.1. Environmental Conditions within the Subbasin		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
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,[3] b) potential,[4] c) future/no new action,[5] 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?		
Reviewers: Yes overall, but only partially (Partial 2) in terms of a, b, and c above and only partially (Partial 2) in terms of the difference between current conditions in the various reference conditions. For more analysis, please see comments below in the green field.		Yes	2

[3] The historic condition refers to the state of the environment at the time of European settlement, or 1850.
[4] 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.
[5] The future/no new action condition is the state of the environment in 2050 assuming that current trends and current management continues.

I.C.1.2	Does the assessment classify 6th field HUCs (or other appropriate assessment unit) within the subbasin according to the degree to which each area has been modified and the potential for restoration?		
Reviewers: Please see comments below in the green field.		Partial	2
I.C.2. Out-of-Subbasin Effects and Assumptions			
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.		
Reviewers: Please see comments below in the green field.		Partial	2
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: Please see comments below in the green field.		Partial	2
I.C.3. Environment / Population Relationships 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: The Assessment did not adequately identify important environmental factors for each life state of focal species. For more analysis please see the comments below in the green field.		No	2
Summary comments and evaluation on the Environmental Conditions Section: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?			
Reviewers: The planners conducted extensive field programs to populate the EDT model for summer/fall Chinook and steelhead. They have also used a QHA approach for bull trout and a more qualitative assessment for sockeye salmon, because the bio-rules for sockeye have never been developed. For sockeye, however, none of the assessment is provided. In addition, the plan offers minimal assessment for wildlife. The overall assessment could be improved by treating the wildlife and all fish focal species as the Assessment has for chinook and steelhead. The EDT assessments are limited by two issues: (1) only one contrast was developed, and (2) only one fixed out-of-basin analysis was provided in the EDT runs. The one contrast conducted is not clearly described but referred to assessing the reduction in production potential due to current conditions; thus, it appears that the planners "re-constructed" a past or historical condition. Making this clearer will increase the usefulness of the plan. A strong point of the analysis was that the planners rolled the reaches into Assessment Units and attempted to summarize EDT results by species and		Partial	2

stage so that the potential by AUs could be assessed. The summary tables by AU were informative. However, the summaries by AU and scoring across species could definitely be taken further. This plan provided little evidence of an attempt to identify key environmental correlates, assess the plan's ability to provide key environmental correlates or assess the long-term viability of aquatic populations based on habitat availability and condition anywhere in the text. Effect of the local environment on wildlife populations is generic among the subbasins in the Columbia Cascade and based on the WDFW document (Ashley and Stovall 2004). Unique effects of the subbasin should be considered.		

I.D. Ecological Relationships *Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?*	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
I.D.1. Inter-species Relationships 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?		
Reviewers: This plan acknowledges important species relations between fish and wildlife. However, this plan does not identify key species relationships within this subbasin.	Partial	3
I.D.2. Processes and Functions 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?		
Reviewers: The authors acknowledge these interactions and provide an extensive text on ecological interactions, or at least the possible interactions that could occur. Reviewers have not dealt extensively with these issues for this basin as the species and aquatic habitats are extremely disturbed. Reviewers doubt there is a basis for anticipating what these interactions may be. This is likely less true for sockeye in the Okanogan lakes. The discussion for wildlife is again much less well developed.	Partial	3

I.E. Interpretation and Synthesis / Limiting Factors and Conditions

I.E.1. Limiting Factors and Conditions Does the assessment describe: **1) Historic factors or conditions** that led to the decline of each focal species and of ecological functions and processes? **2) Current key factors or conditions** within and without the subbasin that inhibit populations and ecological processes and functions relative to their potential.		
Reviewers: This plan only partially describes historic factors and conditions and current factors and conditions. It does not offer any distinguishing factors that can, or cannot, be corrected or influenced by human actions. Adding this information would increase the efficacy of the plan.	Partial	2
I.E.2. Key Findings 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?		
Reviewers: Status of the species - partial 2 (P2). Status of the subbasin environment - P2. Biological performance of focal species - P2. Overall health of the ecosystem - P2. Potential conflicts and compatibilities between individual species and the ecological process - No. Determination of key impeding factors - P2. The response to these points is quite variable by species and topic. A good effort was made and a meaningful basis is provided for focal fishes in the Assessment Unit (AU) summary tables (Section 6.2). These tables provide key findings (by species within geographic areas) that lead to objectives, working hypotheses, and strategies at the AU level. This is more holistic than analyzing by individual species or issues. But the summaries do not consider wildlife or terrestrial habitats, nor do they indicate the potential benefits of actions for fish. Adding this information would augment the utility of this part of the plan. The AU's identify the key uncertainties and data gaps for these focal fish species. The EDT method, as applied, allows estimation of losses (this analysis was only made for spring chinook, summer/fall chinook, and steelhead), but does not provide estimates of the species abundance and productivity that would be present under specified restoration conditions. This is because only the historic reference conditions were applied to compare with current conditions. Reference is made to restoration in the text, but our current understanding is that this refers to reversing the loss estimated between historic and current templates. This is not completely clear in the text. The plan did consider the degree of uncertainty involved in EDT assessments, but it is not evident how these assessments carried through in the Assessment.	Partial	2

There is no comment in the plan about identifying properly functioning habitats with stronghold populations (refugia) that should receive high priority for protection. However, there are habitats in the Okanogan that could be refugia for sockeye salmon. Exploring this would further enhance the plan. Other refugia that could be inferred from the plan would include kokanee and rainbow trout, but these are species of minor importance in this plan. The plan did a good job of presenting numerous examples of blockages or obstructions for aquatic species that are restricting access to functioning habitat. They are identified but not collated or noted as a strategy for restoration. This plan doesn't identify aquatic habitat areas representing the range of habitat type within the subbasin that might serve as reference sites for future monitoring and evaluation. Including this information would increase the usefulness of the plan. The plan offers limited examples of compromised aquatic habitats that have had significant population losses and should be considered a high restoration priority with the notable exception of the Okanogan Lake sockeye and kokanee. Key habitats for steelhead and possibly bull trout could be inferred also. There is no collation of these opportunities. The Assessment Unit summary tables contain lots of suggested interim strategies and actions. There are far too many of these, however, and they are not prioritized. Limiting this list and prioritizing the actions will augment this portion of the plan. The following comments pertain to the NOAA questions regarding development of a habitat recovery plan in the Subbasin Planning Technical Guide. Presumably, the description of the relationship between habitat quantity/quality and fish abundance, along with the current and historic habitat conditions population, and the estimated and current juvenile and adult capacities are again related to the EDT assessment conducted on spring chinook, summer/fall chinook and summer steelhead. QHA is applied to bull trout and a more qualitative (expert) assessment was conducted on sockeye salmon (but these results were apparently not incorporated in this report). As the authors noted, much of the data used in these EDT assessments is of uncertain value. Changes in spatial structure by aquatic species could be inferred from results presented but are not specifically assessed. The Assessment describes many causes of aquatic habitat loss but does		

not refer to, define, or assess what is needed for "recovery." Doing so would increase the usefulness of this plan. EDT was not used to identify restoration opportunity areas, but EDT could have been used to determine the relative importance of these restoration areas/actions. This analysis was done within reaches by identifying the limiting factors, but the Management Plan presents results at a higher level (AU level) and does not identify the restoration opportunities across the various AUs. There are no references in this report to characteristics needed for viable salmon populations or ESUs. There are many interim strategies/actions suggested in the Assessment Unit summaries, but these may not be "prudent interim actions." Their use would assume acceptance of this assessment, and there is no priority assigned to actions. Prioritizing them would augment their usefulness. Again, the plan is less well developed for terrestrial focal habitat and species.		
I.E.3. Subbasin-wide Key Assumptions/Uncertainties ("Working Hypothesis") 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?		
Reviewers: See comment below.	Partial	3
Overall impression and evaluation of the Assessment: 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 comment here (e.g., socio-economic descriptions or analysis).		
Reviewers: A significant effort has been put into the aquatic habitat data and EDT work for spring chinook, summer/fall chinook, and summer steelhead. QHA was applied for bull trout, and a more qualitative assessment was apparently conducted on sockeye, but this is not documented in this report. A good initial effort was made to summarize the reach and EDT analysis into larger geographic areas (Assessment Units, AU's) and to score the AU's across species. Taking this even farther would further enrich this section of the plan. The wildlife and terrestrial habitat portions are informative but excessive in detail and sometimes inconsistent between sections. Wildlife and plant considerations are inadequate at this time. There is a basis for a good subbasin assessment, and the emphasis on ecosystem health generated by the emphasis on focal habitat types is good. However, at this time, the assessment remains incomplete. The Assessment is based on the generic document by Ashley and Stovall (2004) and should be	Partial	3

more specialized to the unique conditions of the Okanogan subbasin. The Assessment unfortunately suffers from a serious lack of editing and checking. In the fish focal species sections, it is not clear what the agreed focal species actually are. There are also sections of this report that are apparently copied from the Methow as there are maps for the Methow and text still refers to the Methow. Overall, this is a good initial effort that appears to have been rushed at the end, and needs more thought, completion of analyses, and discussion to become complete.		

II. The Inventory

(This checklist section was developed from pages 11-12 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 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).

II.A. Existing Protection		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
II.A.1	Does the inventory identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?		
Reviewers: See the blue summary field at the end of this table for more specific comments on the Inventory.		Partial	2
II.A.2	Does the inventory assess the adequacy of protections for fish, wildlife, and ecosystem resources?		
Reviewers: The Inventory does not assess the adequacy of protections for fish, wildlife, and ecosystem resources.		No	3
II.B. Existing Plans			
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: No additional comments.		Partial	3
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: The Inventory does not assess the consistency of existing plans with the subbasin's assessment.		No	3

II.C. Management Programs / Restoration and Coordination Projects 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?[6]		
Reviewers: No additional comments.		Yes	1
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: The Inventory adequately identifies the lead entity, describes the activity, and identifies how the project was authorized, who is responsible for implementation, and what the funding source is. The plan does not identify the program's relationship to other activities in the subbasin.		Yes	1
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: The Inventory adequately identifies the limiting factors the plan is designed to address.		Yes	1
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		
Reviewers: The Inventory did not summarize the accomplishments or failures of each management program activity.		No	3
II.C.5	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?		
Reviewers: The Inventory does not adequately relate the assessment to existing activities.		Partial	3
	Overall impression and evaluation of the Inventory: 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 comment here (e.g., socio-economic descriptions or analysis).		
The Inventory provides an extensive and detailed listing of authorities, legislation, and regulatory processes within the US and Canadian portions of the subbasin. One limitation for the subbasin that is not fully described is the water management and flood control regulations within the Canadian side of the basin. These agreements must limit the availability and seasonality of water for the lower Okanogan River, but this is not described in any detail. Including a detailed discussion of this will increase the utility of this subbasin plan.		Partial	3

[6] 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?

The Inventory provides an extensive discussion of artificial production of aquatic focal species related to the Okanogan Subbasin, but it reads more as a stated desire for more enhancement than a critical assessment that tries to integrate artificial production with the habitat and fishery concerns in this basin. Editing this to have it function as an assessment rather than an overview would improve the plan. The plan provides an extensive table of projects within the Okanogan Basin over the past 10 years (Appendix D). The Appendix, however, does not include any indication of their results and/or indication of their applicability to the current assessment. This Inventory is highly descriptive and involves very little technical material for review. There seems to be an excessive volume of text related to hatchery supplementation but this likely relates to the interest in the Chief Joseph Hatchery proposal. Overall, the planners should better relate this inventory section to the assessment section.		

III. The Management Plan

(Derived from pages 12-16 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 management plan.

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).

III.A. The Vision for the Subbasin 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):	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
Reviewers: The plan provides an adequate vision statement. Please see the penultimate blue "Overall Comments" section near the end of the checklist for more analysis and specific comments on the Management Plan.	Yes	0

III.B. Biological Objectives

Does the Biological Objectives Section of the Management Plan describe physical and biological changes within the subbasin needed to achieve the vision?

Reviewers: The plan does not adequately describe physical and biological changes within the subbasin.	Partial	2
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.[7]		
Reviewers: Please see "Overall Comments" section below.	Partial	3
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.)		
Reviewers: Please see "Overall Comments" section below.	Partial	2
III.B.3.Where possible, are the biological objectives empirically measurable and based on an explicit scientific rationale; i.e., quantitative with measurable outcomes?		
Reviewers: Please see "Overall Comments" section below.	Partial	3
III.B.4. Are biological objectives identified for both the short and long-term?		
Reviewers: The biological objectives are not identified for both the short and long-term.	No	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: In general, the biological objectives appear complementary to the programs of other agencies, at all tiers, within the subbasin.	Yes	1
III.B.6. *Clean Water Act*: 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?[8]		
Reviewers: Please see "Overall Comments" section below.	Partial	1
III.B.7. *Endangered Species Act*: 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?[9]		
Reviewers: Please see "Overall Comments" section below.	Partial	2

[7] 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.

[8] *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).

[9] 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.

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.)		
Reviewers: This plan does not analyze disagreements among co-managers. Please see "Overall Comments" section below.	No	1

III. C. Strategies[10]		
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)[11]		
Reviewers: The plan adequately demonstrates internal consistency.	Yes	1
III.C.2. **Consistency with the Fish and Wildlife Program.** Are the Strategies proposed in the subbasin management plan consistent with those adopted in the program? (Council Question 4)		
Reviewers: The plan does not adequately demonstrate consistency with the Fish and Wildlife Program.	Partial	3
III.C.3. **Consideration of Alternative Management Responses.** 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)[12]		
Reviewers: The plan does not adequately consider alternative management programs.	No	3
III.C.4. **Prioritization.** Does the Strategies Section describe a proposed sequence and prioritization of strategies?		
Reviewers: The plan does not adequately prioritize its strategies.	No	3
III.C.5. **Additional Assessment Needs.** Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		

[10] *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.

[11] 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.

[12] 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 plan does not adequately identify additional assessment needs.	No	3
III.C.6. **Clean Water Act:** 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: The plan does not adequately describe how the strategies are reflective of the TMDL.	Partial	3
III.C.7. **Endangered Species Act:** 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: The plan does not adequately describe how its strategies are reflective of ESA-based goals.	Partial	3

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 inform elements of a subbasin plan's RME section (Technical Guide pp. 14-16). The subbasin plan should also explain how they incorporated existing monitoring guidance from state programs.

III.D.1	**Research:** 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?	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
Reviewers: The RME section does not adequately describe a specific research agenda. Please see "Overall Comments" section below.		Partial	3
III.D.2	**Monitoring Objectives:** 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?		
Reviewers: The RME section does not adequately identify monitoring objectives, but the RME section is more developed than most reviewed in other subbasin plans.		Partial	3

III.D.3	**Monitoring Indicators:** 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)?		
Reviewers: The RME section does not adequately identify monitoring indicators. Again, the section is better developed than most we have reviewed, however, please see "Overall Comments" section below.		Partial	3
III.D.4	**Data and Information Archive:** 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?		
Reviewers: The RME section does not adequately describe a data and information archive.		Partial	3
III.D.5	**Coordination and Implementation:** 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.		
Reviewers: The plan does not identify who will collect data or what the proposed costs are. It does briefly address coordination.		Partial	3
III.D.6	**Summary Question. RME Logic Path (Evaluation and Adaptive Management):** 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?		
Reviewers: The planners have addressed many of the issues related to development of an adequate RME plan; however, the plan is overly optimistic and incomplete.		Partial	3
	Overall impression and evaluation of the Management Plan: 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 comment here (e.g., socio-economic descriptions or analysis).		
Reviewers: <u>Comments on the vision statement:</u> The Okanogan Subbasin vision statement does a good job of being quite consistent with the Council's plan. The Okanogan vision statement is on page 11 of the Introduction. The reviewers ignored the vision statement for the Methow (page 281). <u>Comments on the biological objectives:</u>		Partial	3

The biological objectives for aquatic resources are not collated in one section but are incorporated into the Assessment Unit summary tables. These summaries applied the results of the subbasin assessment but have not yet identified or defined a "recovery" or restoration level of abundance. Defining this will increase the efficacy of the biological objectives. Limiting factors are summarized by AU and for the species of interest in that area. The aquatic biological objectives are based on the subbasin assessment and resulting working hypothesis assuming that the Assessment Unit summary tables are an adequate expression of the biological objectives. The biological objectives are infrequently quantitative with measurable outcomes; very few of the objectives are quantitative as of yet. The aquatic biological objectives are complementary to programs of tribal, state, and federal land or water quality management agencies in the subbasin and consistent with the Endangered Species Act recovery goals and Clean Water Act requirements as fully as possible. However, this assessment is only based on statements within the Management Plan, and should be considered within the frame that no actions have yet been agreed upon or prioritized. Also, there is a heavy emphasis on artificial production in the Management Plan, but this seems at odds with some of the founding principles in the Introduction. The plan does not analyze whether or not it 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. No differences of agreement were identified in this text. It is possible that differences could occur between the Colville Tribe and the Okanagan Tribe due to the Colville's interest in hatchery production. This may not, however, interfere with any interests of the Okanagans. Terrestrial biological objectives are generic among subbasins of the Columbia Cascade Province and should be discussed for potential specialization to unique conditions of the Okanogan Subbasin. <u>Overall Comment on Strategies</u>: The aquatics section of the plan takes into account both the desired outcomes, and the physical and biological realities expressed in the working hypothesis, while explaining the linkage of the strategies to the subbasin biological objectives, vision, and the subbasin assessment based on the Assessment Unit summary tables that really constitute the heart of the Management Plan. In each Assessment Unit, objectives, hypotheses, and strategies are presented in sequence and are intended to		

address the limiting factors identified for the AU. Terrestrial strategies are generic among subbasins of the Columbia Cascade Province but should be discussed for potential specialization to the unique conditions of the Okanogan Subbasin. <u>Comments on ESA and CWA Consistency:</u> The plan provides a short narrative about the CWA but does not offer any consideration of how actions would the integrated with a water quality plan. The plan refers to ESA assessments and the TRTs but there is inadequate indication of any direct interaction or coordination. Adding this, or explaining why it is not present, would increase the efficacy of the plan. ESA issues for terrestrial species are inadequately discussed. <u>Overall Comments on the RME Section:</u> The planners have addressed many of the issues related to development of an adequate RME plan, however it is incomplete and much work remains to develop it into a realistic plan. The section contains one of the better attempts to coordinate and standardize monitoring efforts among involved agencies. Monitoring and evaluation will be major considerations in the subbasin plans, but much work remains in this draft of the Okanogan Subbasin Plan. The text is confused, suffers from an apparent lack of time to begin the difficult task of cutting down the long "wish lists." In its present form, it provides little confidence that a realistic, economic M&E strategy will result. The long lists under guidance, principles, goals, and questions indicate the complexity involved in developing a comprehensive M&E program for several species, interests, and a diverse area such as the Okanogan subbasin. While this cataloging represents a good start, it does not constitute a plan. The lists may be a necessary first step, but it is very likely that an efficient plan will not allow one to ask all of the questions or to measure all of the data suggested by the comprehensive list. Given the primary limiting factors that resulted from the Assessment, and the varying levels of confidence shown in some of the critical data, the M&E plan does not appropriately address the design of a program to verify this assessment and test key assumptions. <u>Overall Impressions of the Management Plan:</u> The plan makes a good effort to collate the aquatic assessment into Assessment Units, but the prioritization of actions and how this		

collation would be accomplished remains to be established. The plan needs to determine how it will go about doing this before it is complete. The plan has also not been integrated with the Council's Fish and Wildlife Plan, the CWA, or the ESA and TRT efforts. It must do this to maximize its efficacy. Terrestrial section is generic among subbasins of the Columbia Cascade Province and should be specialized for the unique conditions of the Okanogan Subbasin. The plan's RME section is a necessary start, but it is overly optimistic and incomplete. . Reworking it will require significant work for the entire subbasin.		

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 identity 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:

Reviewers: See comment above.	Partial	2

Editorial and Specific Review Comments

Section (S) 2, page 4: The map of this large watershed is simply too small to be of any informative value. A good clear map as a reference tool in this large report is needed. Possibly, a US and a Canadian map would allow sufficient increase in size to be more useful. A general reference map including the communities noted, tributaries, etc. would be very useful.

As a general feature of the maps, the contrast is very difficult to read in these electronic files. Production staff should investigate how to improve the quality of the many maps and figures used.

S2.5, page 11: a good general Vision statement

S2.5.1 and S2.5.2: a detailed expression of the assumptions and founding principles, two minor comments: in S2.5.2 the text refers to the six founding principles, but a clearer relationship linking the principles to the six key elements would have clarified this section; more importantly, these lists of principles are very detailed and extensive and some are certainly clearer in purpose than others are. For example, the 4th and 5th points under key element 1 are not clear to reviewers.

In revision, these founding principles and assumptions should be written as clearly and concisely as possible. Each point must be understandable for any future planner to be able to use.

Concerning the key element 3 (Out of basin effects) … this was not particularly well addressed in the Plan. Is it really a key element? The local planners have limited control but will need to be aware of the out-of-basin effects as limiting factors, but it does not seem to be used in the same context or manner as the other five key elements.

S3.2, pages 17-36+: Much of this section was well done and informative. Some remaining questions were:
- concerning irrigation, there is 40% of the irrigated lands not accounted for in this section, where and what is it?
- population growth in the US portion was only for current values, any projections available?

NOTE: There is a page error after page 36 in Section 3.2. Figure 11 in electronic copy reverts to page 1 again and is then consistent through the remainder of the Plan.

S3.3, page 3, Habitat Areas and Sub-watersheds:
S3.3.2 US Sub-watersheds, Table 7 … This is a useful table but could be more so if the areas of anadromous access/use was added by tributary, and if the number of reaches in each was added and each tributary was mapped into its Assessment Unit. The mapping of spatial areas into Assessment Units is not done until in the Management Plan.

Pg 9, Reach 2: describe the location as in Reach 1. Should the reference to 'reach 1' in the 6th line actually be to reach 2?

Pg 16, Aeneas Creek: the numbers in the lower 3rd paragraph are very confusing, what was the point?

Pg 21, in text on Ecology of Okanogan subbasin: at the end of this text, there is a statement that "elevating the current threats to Okanogan biodiversity to an international conservation priority."

What is the basis of this statement and its source? If this is a significant issue for the basin, this comment is lost in the remainder of this Plan.

Pg 27, Vegetation Status: at the beginning of this section there is a reference to an Appendix ? … clarify. In the Noxious Weeds section there is reference to some inventories that have been developed, but no information is presented.

Pg 28, Water Resources: some redundancy in this section. The flow data presented does not address the seasonality of flows but does note that summer low flows have been "very much affected" over time. There must be some changes in seasonality of flows and with increased irrigation. It would more informative to provide annual flow patterns by time period and season, and to examine annual variability in flow over time.

S3.3.3, page 31, Fish Species: Species are list in Table 11 but the status of the species is referred to Appendix C, these could easily be incorporated to provide a more informative table.

S3.3.3, page 33: Focal Species referred to incorrect section, should be S3.8, page 43.

Reference to Table 8 is incorrect, Table 8 in this text is Habitat Types, US paragraph on page 33 refers to two different status ratings for Steelhead (Endangered or Depressed?)

Pg 35, Figure 15: Why doesn't the focal species extend to McIntrye Dam in the Okanagan River?

S3.3.5, page 37, Table 12: This table seems to be the same as Table 11 and does not clarify the designated population segments. What is the value of this Table? The section should define how a designated population segment would be used.

S3.4, page 39, Wildlife, US section: paragraph refers to Appendix D but it actually 'C'

S3.6 page 42, Table 14: the table includes Fish under the wildlife focal species, but the fish included in the table are not the focal species identified in Section 3.8 (I think, see below)

Section 3.7, title but no text?

Section 3.8, page 43, Fish Focal Species: This Section needs to be extensively edited and clarified. This is a fundamental request of the NWPCC but this section is poorly written. What are the focal species … consensus seems to have been sockeye, summer/fall chinook, kokanee, rainbow trout, and summer steelhead (page 43). But why are there references to seven species including spring chinook, and bull trout … neither of which are known to exist naturally in the subbasin? The following sections of text would then have to be edited.

S3.8.1 Sockeye, Table 15, page 46: The caption and column labels must be added to this table, and some comment made concerning the types of data and why the differences exist.

S3.8.2 Summer/Fall chinook, page 50: extensive duplication in this section's text. Page 53-55, Tables 16 and 17, correct presentation
S3.8.2 page 58: Are points 2 and 3 actually additive so that over 2 million new smolts would be produced?
S3.8.2 page 59, Table 18: No table presented.
S3.8.2 page 59 Harvest: reviewers were unable to understand a point in the 1st paragraph.

S3.8.3 page 60 Spring Chinook: Is this actually a focal species … how would it be selected if it is truly extirpated? This section also has too much redundancy.
- page 60, 1st para, 4th line … should 'not' actually have been 'now'?
- page 62, 1st sentence under bullets: Is this sentence in correct location … what does it refer to?

S3.8.4, page 67, Figure 19: What does 'cycle' refer to? No explanation provided.
S3.8.4, page 69: page refers to six possible life history types, but the bullets are labeled from #4 to #9?

S3.9 Other Important Fish Species, page 78: reviewers don't have a real problem with including these species, but is there a value or role for them in the Plan, this is never really explained or clear?

A serious concern for these fish focal species is that some are extirpated, others with unknown distributions, and all are salmonids. Plus, any production of Spring chinook and the majority of summer/fall chinook will be from hatchery production. Reviewers were not convinced that these are particularly sensitive choices of focal species if the purpose is to monitor habitat restoration and ecosystem production.

S3.11, page 82: Table 21 … what is the value of this long table? It is duplicated in Appendix A and the columns are not consistent with previous habitat sections:
Table 8, Habitat Types, page 24: Herbaceous Wetlands and Riparian Wetlands both included.
Table 14, S3.6, page 42: used Riparian Wetlands as a focal habitat.

S3.14, page 91, Focal Wildlife species: addresses species in four habitats but the report only refers to three, and questions why Rugged Terrain is not included? Is Herbaceous Wetlands a focal habitat or not?

S3.15, page 92 through S3.16.11, page 131: Theses sections are long and unnecessarily detailed, plus the section is incomplete. Section 3.16 does not include 6 of 17 species in Table 22, including Sage thrasher, Sage grouse, Pygmy rabbit, Willow flycatcher, Lewis woodpecker, and Red-wing Blackbird.

S3.16, pg. 114, Table 29: incorrectly cited in the text and caption is incorrect. This could be a useful table and formatted to substantially reduce the text in sections 3.16.1 to 3.16.11. For example, it will be important to know if information on the focal species is useful for future monitoring efforts. You may also wish to review the location of this table.

S3.18, pg 134, Environmental conditions: Not certain of the value of this section. NOTE: Figure 38, page 135 is a METHOW map, not Okanogan.

S3.18, page 138, Table 34: the section on introduced fish species is for Okanogan lakes only, and does not provide any information on the Okanogan River or aquatic plants.

S3.19, page 139: This section now includes Rugged Terrains and NOT Herbaceous Wetlands. This is more indication of confusion or disagreement on focal habitats?

S3.19, page 141, Figure 40. Use a log-scale for Y-axis; this will expand the scale so that small values can be actually presented.

S3.19, page 144, Figure 41: This figure is not about shrub steppe as referred to in the last line of page 144.

S3.19, page 146: The first bullet is a statement and not one of the preferred or desired conditions.

S3.21, page 147, Table 35, Fishes in the Upper Columbia: Is this the correct title? It is not clear to reviewers what the information or value of this table is. The source of the information needs to be cited, the column titles require explanation, and there should be some indication of the frequency of occurrence of these species.

Pages 151 through page 164, S3.29: All this detailed text could be very substantially reduced or summarize in a table. The material is far too detailed for a general planning assessment and the impacts are only addressed concerning spring chinook and summer steelhead. Why would this be and how is it consistent with focal species? In the reviewers' opinion, this material is largely unnecessary. Surely these biological interactions are what ecosystem management is all about.

S3.29, page 164, Limiting Factors: The topics included seem very selective and incomplete. What about factors such as: fishing and hunting, hatchery practices, flood and flow controls, and international agreements, Agricultural development and irrigation. Why is this small section even included? A consideration of limiting factors should certainly be more important than the preceding pages (see comment above).

S3.30, pages 164-173, Limiting Factors Overview: This is all very general background and does not even include the topics in S3.29, nor is it balanced by areas or issues identified within the subbasin. Again, it is not at all apparent why this section was written. Reviewers would suggest omitting or deferring to an appendix.

S3.31, pages 173-182, Decline of Focal Species: While the topic may be appropriate for a sub-basin plan, this section is again too specific to two species (Spring chinook and summer steelhead) and is not a consideration of the focal species. It reads like an impact statement about the 4-H effects on these two species only, and further, why is the emphasis on hatchery supplementation and merits for future fisheries? The material seems out-of-place and is not a balanced discussion of the focal species.

S3.33, page 185: Why is the section on upper Columbia SAR's separated from the previous section? What is the source for these SAR values and what populations were included?

S3.33, page 187, last sentence of Out of Subbasin paragraph: "The variability in SAR indicates that the survival rate of smolts leaving a subbasin is highly dependent on conditions both inside and outside the subbasins." Given what has been presented, it is not apparent why this would be concluded. The only information associated with the SAR's concerned out-of-basin effects. This statement needs clarification or presentation of data to support this conclusion.

Figure 45, page 189: Either the explanation or the EDT run that generated these curves (3 frames in the figure) needs more explanation. If you are only applying a range of constant values for OOSE, then why aren't all three frames linear? Diversity would result from applying a constant value to each trajectory … unless the survival is applied differentially and not drawn randomly. This would be an added process error but not simply related to a direct effect of OOSE on population parameters. NOTE: the figure references in this section are frequently incorrect.

S3.35, page 191, Synthesis: This section is again narrowly focused on spring chinook and steelhead. Also, why does this section not comment on a past role of hatcheries, e.g., mixed-stock origins of new hatchery populations?

S3.36, page 193, Methods and Interpretation (EDT section), last sentence, 1st para: "Regardless of the means whereby Level 2 information is obtained, the characterization it provides can be ground truthed and monitored over time through an adaptive process."

Reviewers agree completely but did not see this important point highlighted in the Management Plan or M&E programs.

S3.36 … there is extensive duplication of certain paragraphs through this section.

S3.36, page 193, reference to sockeye salmon: reviewers accept that bio-rules for sockeye did not exist, **but where are the results from the Canadian Habitat Workgroup, and what were the major findings? Why couldn't those results be summarized in tables similar to the ones following this text on page 193?**

S3.36, page 194, Table 38: correct Harvest title within the table.

S3.36, page 196, first paragraph: description of stream reaches and Assessment Units would have been aided by a map or table of reaches and the AU that each was mapped into. Page 196 is also the first reference to "patient current conditions" and template (reference) conditions. More care needs to be taken in describing these conditions and what they represent and how they are represented, see next comment.

S3.36, last paragraph of page 196: Clarification needed on the current and template conditions. Reviewers understanding of this paragraph is that the template was historical (i.e., less disturbed) conditions … but why does this paragraph refer to "prevailing climate, geologic, geographic, hydrologic, and biological characteristics." The next sentence then refers to reductions in focal

species performance, which again implies past conditions. The use of 'prevailing' is confusing. Does it refer to some limited restoration of current conditions towards historical conditions due to fixed features in the current conditions?

S3.36, page 197, 1st paragraph refers to an Assessment Unit Summary sheet in Section 2.6 (Synthesis and Interpretation) … while this seems to be an important Section, reviewers could not locate this type of summary, where is it? Also, the text refers to scaled and unscaled results without any definition of what the difference is, or how the scaling is conducted.

S3.36, page 197, last sentences of 2nd paragraph: reviewers disagree with this statement. The use of one set of OOSE values for both the current and template conditions within the Okanogan Subbasin means that the assessment could only compare EDT outcomes for changes WITHIN the subbasin. Any use of one set of OOSE values is the same as assuming a fixed out-of-basin impact.

S3.36, page 198, 3rd paragraph: This is a useful approach to summarizing EDT results over species and by AU's, but it only weights the AU's by listed species. Future work could incorporate an inverse weighting by the confidence scoring described in the text, and by a cost or acceptability score. The weighting method for prioritizing AU's seems to have merit but should be further explored with the communities.

S3.36, page 199, 2nd para.: text seems to relate to Methow again.

S3.36, page 199, last few paragraphs … are these supposed to be in a discussion of QHA?

Page 200, **Section 4.1** (?) Developing Wildlife … Is this section numbering correct?
The description was OK, but there are absolutely no results presented? How will the 'Central Wildlife Habitat Hypothesis' be used? Where is it addressed in the Management Plan?

S4.2, page 201, Synthesis of Key Finding, Sockeye: **NO tables 6 or 7, so no results**. Again, what does the last sentence refer to?

Page 202, Data Availability and Quality: This section seems to be included under Section 4.2.4 Steelhead, but would seem to be more generally applicable, should it be re-numbered?

The section should clarify the differences between category 2 and 3 assignments. Category 2 seems to be localized extrapolation within a subbasin, whereas category 3 is a broader-based extrapolation or inference based on data from other subbasins … is this correct?

Page 203-206 … This section makes important comment on data needs and sensitivity of results to data. There are several good points about data limitations and the lack of use of the information concerning uncertainties.

Page 205, Figure 46: What is the value/need for this figure?

Page 206, Table 40: How was Category defined? Need to be more careful in describing the contents of figures and tables.

Section 4.2, page 201 … essentially all the table and figure numbers are incorrect in this important summary section. Captions need to be standardized for clarity.

Page 214, Table 45: reviewers understood that survival factors were summed across species, so why are all entries in this table only 1, 2, or blank? This is a key summary table that must be understood.

Page 219, Table 48: This is a good short-list summary, but are these entries assumed to be prioritized? If so, how was this conducted and by whom? If not, it needs to be stated.

INVENTORY, Section 5, page 236:

The authors acknowledge immediately that analysis of the Inventory is incomplete, including the portion not undertaken.

Page 238, Figure 50: could present the distribution of protected lands within the subbasin but the basis of the categories is not described and the resolution of the figure was too limited for use.

There is significant redundancy in the first few pages of this section.

Pages 240-259: provides an extensive and detailed listing of authorities, legislation, and regulatory processes within the US and Canadian portions of the subbasin. One limitation for the subbasin that is not fully described is the water management and flood control regulations within the Canadian side of the basin. These agreements must limit the availability and seasonality of water for the lower Okanogan River but is not described in any detail.

The Plan provides an extensive table of projects within the Okanogan Basin over the past 10 years (Appendix D). The Appendix, however, does not include any indication of results and/or indication of applicability to the current Plan.

This section is highly descriptive and involves very little technical material for review. There seems to be an excessive volume of text related to hatchery supplementation but this likely relates to the interest in the Chief Joseph Hatchery proposal.

There is no apparent effort to relate this Inventory section to the Assessment sections.

MANAGEMENT PLAN, Section 6, page 279

Page 279, 1st paragraph: Unfortunately, this introductory paragraph is NOT an accurate description of the involvement of Canadian members of this subbasin.

Reviewers **note**, however, that the remainder of the Introduction to this section actually refers to the Methow (again, see Section 6.1, page 281) and reviewers therefore wonder if the above

paragraph was copied over and is not truly an accurate statement throughout the Okanogan subbasin.

S6.1, pages 281-282, Figures 52 and 53: The Okanogan planners flow figures would benefit from some revision. The ISRP/AB review team for the Columbia Cascade subbasins provides a draft flowchart on the last page of this subbasin plan review. The full ISRP/AB did not have time to review the flowchart, but the chart is provided to assist the Okanogan planners in further developing their logic path.

S6.2 Assessment Unit Summaries:
Page 282: The text refers to "salmon habitats", is this accurate as opposed to each focal species?
Page 282: The text describes four "coarse filters" in developing specific strategies. Reviewers think these are actually quite good filters but given the numerous strategies within each AU, it is very difficult to see how these filters were actually applied. Also, are the sequence of objectives and strategies meant to imply a priority within an AU? This is not commented on in the text.

In Assessment Units 1 and 2, the AU geographic descriptions are not apparently limited to the spatial scale of the maps or the number of RM described. This should be checked.

Inclusion of Level of Uncertainty is a good idea in these summary tables, but reviewers did not find the inclusions helpful, with the exception of the brief statements in the Canadian portions. With the work by survival factors conducted by reach, possibly you could create a weighted score for confidence within each AU, or possibly confidence should be a scale assigned to each objective.

In the concluding portion of each Summary on Data Gaps and M&E Needs, are these directly related to the EDT results or what basis was used to determine these statements? These could be useful guides to future programs and how the content was determined should be described.

Page 287, Reach 2: the first limiting factor identified was "reduced natural population numbers"; this is not an EDT survival factor and generates the question about where these limiting factors were determined. If there are multiples sources, possibly the Plan should identify the source for each (EDT could be a default and only exceptions identified).

In AU's 1 and 2, the first "hypothesis" listed relates to Artificial Production. This seems to be more of a belief (or desired) statement than a testable hypothesis, but may relate to the comment made above. The concern would be that the Assessment was to identify limiting factors and used to frame the management plan. It would be unfortunate after all that work to subjectively determine the primary objectives … which may not address the true limiting factors.

The majority of the statements that are called "hypotheses" are not really stated as such. They are more like goal statements and would then relate more directly to the Assessments.

AU 2, page 288: What is the basis for the 5% measure? This small increment will be difficult to measure and one wonders why such a small value would be important.

AU 5 … not in the reviewers' copy of this Plan.

Au 6, L. Salmon Creek: it is not clear if the OID dam is passable if water is provided. Obstructions were identified as a primary limiting factor, so presumably not.

AU 8, Omak Creek: Is it correct that the P1 limiting factor is population supplementation to aid in recovery. This has not been identified in any aspect of the Assessment. What is the basis for this assessment as a limiting factor?

AU 13, Inkaneep Creek: map does not seem appropriate to this Creek.

AU 15, description has not been filled in.

General comment on AU descriptions:
The table summary format is a good idea and seems well composed. However, the extensive lists of strategies seem premature until a process for prioritizing the actions desired has been developed. There will always be far too many separate actions to undertake but the Assessment and the original founding principles should determine where to focus efforts and then how to achieve these objectives. Initially, the focus could be on the limiting factors (as has been presented) but then ranked by the four "coarse filters". The AU descriptions also lack any indication of the scale of benefits possible from an AU, and what the value to recovery within the Basin could be. One point of concern is the frequent reference to hatchery supplementation that has not been well linked to the Assessment.

S6.5.1, page 341: Formatting correction … at the end of strategy 3-5, separate Spring Chinook into next heading.

S6.5 Spring Chinook, page 341: The detailed lists of strategies for spring chinook do not seem consistent with the current status of those fish in the Okanogan. Our understanding of the situation is that spring chinook is considered extirpated, and that the critical habitat for spring chinook ESU even excluded the Okanogan subbasin. Spring chinook are known to have existed in the basin, but their current status must be very limited (rare). The approach for spring chinook would seem to be more of a restoration research project, including:

- extensive surveys of natural habitats to locate any existing fish
- possibly use marked hatchery fish as test out-plants to examine useable habitats
- compare habitat used with area of similar available habitats and its distribution
- re-introduce smolts via supplementation (using local brood stock if available) into natural habitats
- augment desired production but isolate from natural production to meet harvest needs (at least until Objective 3 is achieved).

Aspects of these steps are included in the strategies, but they seem far too detailed for a species that may not exist within the basin.

S6.5.2, page 344 Summer/Fall chinook: Since supplementation is ongoing for this species, reviewers understand the interest in these programs, but there is very little emphasis on the re-

establishment of viable natural populations (objective 9 only). Is there any intent to study "naturalization" of supplemented fish as they adjust to the natural environments?

S6.7, page 351 Wildlife Management Plan: Herbaceous Wetlands has again been omitted, this issue relates to several previous comments.

S6.8, page 355, under CWA title: 2nd para., 2 line, not certain of what this statement means, is the point that water quality within the Okanogan is inadequate for spring chinook, bull trout, and steelhead to provide any meaningful step towards recovery of these species within this subbasin?

S6.8.2 Spring Chinook, page 356: What is the value of this text to the Okanogan subbasin? Omit.
S6.8.3 Summer Steelhead, page 357: does the last paragraph of this section actually belong under the general CWA section? Seem out-of-place in this location.

S6.9, page 357: The subbasin planners that developed this Plan did not create the OBTWG (it has been functioning in Canada for over 8 years).

S6.10, page 358, Research: Unfortunately, reviewers have no idea what the value of this section is, reviewers would recommend omitting or rethinking. Reviewers actually disagree with the comment that research needs to wait until an information basis is developed. **In many cases targeted research may be a preferred approach to broad-based M&E** so that specific hypotheses can be tested, evaluated, and adjusted. A good research program can control and test variables as opposed to monitoring natural systems for many years, and observations taken against highly variable natural backgrounds. Once priorities are agreed by planners and communities, a thoughtful research plan may be much more effective in making progress than simply waiting for observations.

S6.11, Monitoring and Evaluation, pages 360-364: The long lists under guidance, principles, goals, and questions indicate the complexity involved in developing a comprehensive M&E program for several species, interests, and a diverse area … but they by no means constitute a Plan. They actually can be very distracting from the establishment of an efficient plan because everything that you want to ask or that you can measure, may not need to be. For example, no question related to the data used in this Assessment. Given the primary limiting factors that resulted from the Assessment, and the confidence shown (or lack of) in some of the critical data, does the M&E plan appropriately address the design of a program to verify this assessment and test key assumptions, etc.?

S6.11, Measurable M&E Objectives, page 364: Why is there no reference to monitoring natural endemic species production? Without this aspect, the plan would fail to meet the needs for recovery of listed species. The use of "error" should be verified and re-examined. Error is a function of bias and imprecision. But in monitoring, an index could be consistently biased, but measured precisely and be a very useful tool for monitoring. Recognizing the sources of error and what you can control for are important aspects of designing a monitoring program.

On page 364, reviewers suggest the four points presented are the "priority objectives":

(1) Presumably, these parameters relate to abundance, productivity, and diversity by species, but why limit to these four only, there were other focal species? Temporal monitoring.
(2) How will you associate the "selected physical habitat parameters" with the cumulative effect of actions? Two issues to consider: the essential use of controlled or untreated streams for comparison, and whether you should measure specific parameters or develop metrics to directly assess cumulative effects of actions?
(3) Would you also monitor passage at the mainstem dams? How would you assess life cycle mortality patterns and sources without this?
(4) Agreed
(5) Following the four points, there are performance standards for artificial production. While reviewers support these, there should be some assessment of interactions between supplemented hatchery fish with naturalized populations.

Page 365, 1st paragraph, 2nd sentence: remove ? at end of this sentence. Remove next 2 sentences, they are redundant.

Page 365, Program Set-up down to Basic Statistical … is this material original, or should it be properly referred to its source?

Page 367: Why would a "statistical design" not imply a "rigorous statistical analysis"? Reviewers may not understand what the authors meant here, but the alternative could be called ad-hoc and has been responsible for many examples of misleading results and inferences drawn.

A "valid statistical design" is simply logical by the authors' definition but their text then clearly implies a formal statistical basis for sampling programs, contrary to your comment above. Reviewers do not understand the hesitation to acknowledge a proper statistical design, sampling, and analysis. These issues need to be clarified in revision.

With the exception of the Canadian M&E example, this M&E section is extensive text as background but totally lacks any design or substance. The Canadian example is likely clearer because it has specific focus and completed work.

Section 6.11 Monitoring and Evaluation will be a major consideration in the subbasin plans, but much work remains in this draft. The text is very confused and provides little confidence that an M&E plan could result from this Plan. Further, the Plan must address monitoring and research for recovery of natural populations, and there is no evidence of any attempt to integrate this Plan with the Council's Fish and Wildlife Program.

Apply the KISS principle first

Draft-1, Planning Cycle

Founding principles, agreements

VISION STATEMENT

Interim assessment checks

Performance assessment, data management, feedback

Adjust

feedback

Management Plan

Assessment
- Data
- Popn. / Habitat status or trends
- Analysis
- Limiting factors

Focal species & habitats

M & E Plan

Research/Projects

Objectives (goals)

Strategies

Gap Analysis

Project Inventory

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