

Lake Chelan

Review Summary

Generally, the Lake Chelan Subbasin Plan meets most of the elements for subbasin plans called for in the Council's 2000 Fish and Wildlife Program and the Subbasin Planning Technical Guide. The plan should provide useful guidance in managing fish and wildlife resources in the Lake Chelan Subbasin and in assessing the effectiveness of management strategies. The overall goal of the plan is consistent with the Fish and Wildlife Program's target of returning native fish and fauna to the lake.

The Lake Chelan subbasin planning effort benefited from the fact that the Assessment and Inventory were mostly completed through a different process (FERC relicensing) before the Council's subbasin planning process was initiated. This allowed their process to be focused on developing a management plan.

The logic path from the limiting factors to the objectives and strategies and then, to the research, monitoring and evaluation (RME) is particularly well done. This approach and several other elements in the Lake Chelan plan could be used as examples for other planners as they revise their management plans. The RME section includes a matrix that links indicators with strategies. This is a logical and useful approach. In addition, the RME plan suggests agencies and other entities that should be responsible for various RME strategies and tasks. These specific assignments should prove to be a major asset in coordinating and implementing an effective RME plan. In addition, this plan's approach to addressing Inventory section II.C.4, assessing accomplishments and failures of past and ongoing management activities, may be an archetype for other plans. Many plans fell short on this section of the inventory.

Like other subbasin plans, the Lake Chelan management plan does not describe the potential for various strategies proposed for use on one species to impact other fish or wildlife species. The fish and terrestrial sections are often done as separate sections with inadequate description of their connection. For example, if the composition of the fish community in Lake Chelan is changed, then it is important to consider what effect that change would have on wildlife species, especially those like the osprey and eagle that prey on fish. In addition, there could be a disconnect between this subbasin plan's focus on native fish species such as the westslope cutthroat trout and an existing WDFW stocking program that focuses on Chinook salmon, rainbow trout, and other recreational species.

There were some questions expressed by the reviewers regarding the history of one of the focal species, bull trout. The Assessment noted that bull trout disappeared from the lake in the 1940s. However, the possible reasons for their extirpation were not fully explored. The plan authors note the occurrence of a "great flood" that approximately coincided with the disappearance of the bull trout. However, no discussion of how a flood might have caused this effect is provided. The reviewers noted that there was a bounty on the bull trout in the 1920s, which certainly may have contributed to their demise. Also, many diversions were built in tributaries to the lake that may have disrupted spawning. The plan also mentions that a disease may have been introduced.

However, there is no compelling evidence that one of these factors, or several in concert, was the primary culprit. A more thorough understanding of why bull trout disappeared from the lake would be valuable information in any effort to restore them. Some of the proposed RME questions regarding bull trout would address some of the factors. However, there is no mention of any attempt to determine if an introduced disease may have been a factor. If the disease hypothesis proves correct, and it is still present in the system, it may be that any attempt at reintroduction would prove futile.

The plan could better describe the US Forest Service and other entities' strategies for management of severe fires and recently burned areas. This discussion should cover the potential impacts to fish and wildlife. A discussion of this is especially important given the large percentage of land in the subbasin under federal ownership and its susceptibility to fire.

The planners noted that they did not incorporate the public process in their planning effort to the extent they desired (e.g., is there local concurrence with the choice of focal species?). Will this need be met through the Council's process and/or through the State Recovery Planning? This is an issue the Council will need to monitor and address as it proceeds in the program adoption process for the Columbia Cascade plans. Several of these plans were substantially affected by or based on the FERC relicensing process and the HCP development, both of which involved a lengthy and comprehensive public process. Further description should be provided on the issue whether that constitutes adequate public involvement.

In sum, there is a lot to like about this plan. The management issues that matter are well considered and well presented. The Inventory is very thorough. The Synthesis is particularly helpful and clearly presented. The prioritization of strategies and objectives is well done, although it could be more clearly presented.

Finally, the document has some rough edges -- grammatical and proofreading errors -- that should be addressed prior to adoption by the Council as part of the Fish and Wildlife Program. See the Editorial and Other Specific Review Comments section below.

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		
<i>General Question to be addressed: Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin? The Council specifically asked that the independent scientific review evaluate whether the subbasin assessment was thorough and substantially complete. The following checklist is to aid reviewers in that determination.</i>		
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: Placing the subbasin map towards the beginning of the plan was useful.		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 plan 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 plan adequately describes 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 plan adequately lists species present in the subbasin.		Yes 0
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: More information on plants would be helpful.		Partial	1
I.A.2. Subbasin in the Regional Context		(Y)es, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>
I.A.2.1	Does the assessment describe how this subbasin fits within its regional context (size in relation to the total Columbia Basin, placement within the ecological province and relationship to other subbasins in this province, qualities that distinguish this subbasin from others in the province)?		
Reviewers: The plan adequately places the subbasin in 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 plan adequately describes the subbasin's relationship to the ESA, ESUs, and USFW bull trout planning units.		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: This subbasin's aquatic elements are mostly isolated from external factors except for human intervention with hatchery introductions. The only anadromous fish are those in the tailrace. The terrestrial element includes migratory species that are discussed in that context.		Yes	0
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 projection of future trends could be explained better.		Partial	1
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: The overview is generally good although some parts of it read like a draft. In addition, the formation of the lake basin is attributed to "glacial carving" but may actually be a graben - i.e., a fissure caused by a collision of shifting landmasses. The lake is 1500 feet deep and the bottom is more than 500 feet below sea level. While portions of the lake may have been affected by glaciation, it seems unlikely that it could have been carved out by glacial action. There are several sources that suggest shear forces from collision of land masses producing a series of faults and grabens, such as the one containing Lake Chelan, are the more likely explanation.		Yes	1

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.)

I.B. Species Characterization and Status		
<i>General question: Does the assessment adequately describe the current status of fish and wildlife focal species?</i>	<i>(Y)es, (P)artial, (N)o</i>	<i>Need for additional treatment (0-4)</i>
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: This plan does an adequate job of identifying focal species.	Yes	0
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: This plan does an adequate job of identifying and characterizing focal species populations.	Yes	0
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 historic status of each focal species population. Some suggestions and additional information regarding the disappearance of bull trout are provided in the Review Summary above.	Yes	0
I.B.4. Does the assessment describe the population's life history, including identifying distinct life stages?		
Reviewers: This plan does an adequate job of describing the population's life history.	Yes	0
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: This plan does an adequate job of characterizing the population's genetic diversity.	Yes	0
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: This plan does an adequate job of describing historic and current harvest.	Yes	0
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 evaluation of both terrestrial and aquatic species was done well.	Yes	0

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.

I.C. Environmental Conditions			
<i>General question to be addressed: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?</i>			
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: The plan adequately describes the condition of the environment in the subbasin.		Yes	0
I.C.1.2	Does the assessment classify 6 th field HUCs (or other appropriate assessment units) within the subbasin according to the degree to which each area has been modified and the potential for restoration?		
Reviewers: The plan does not use HUCs, but rather uses assessment units (aquatic) or habitat types (terrestrial). The assessment includes descriptions of each of the tributaries to the lake, large and small. The plan's approach was adequate for the purposes of this planning effort.		Yes	0
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: There are few outside factors that affect the focal species for this subbasin. The potential "out-of-subbasin" effects that impact migratory songbirds are thoroughly covered.		Yes	0
I.C.2.2	For each focal species, does the assessment establish assumptions for each external effect that can be used to calculate the effects of external conditions on the productivity and sustainability of fish and wildlife within this subbasin?		
Reviewers: This subbasin's aquatic elements are mostly isolated from external factors except for human intervention with hatchery introductions. The only anadromous fish are those in the tailrace of the lake level control structure. The terrestrial element includes migratory species that are discussed in that context.		Yes	0

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.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 plan adequately identifies the important environmental factors for each focal species.	Yes	0
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: This section is well done although it is a bit general in places.	Yes	0
I.D. Ecological Relationships		
<i>Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?</i>	(Y)es, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>
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: The plan identifies many of the important inter-species relationships for the focal species. As noted in the "Review Summary" some discussion of the possible impact alterations in the fish community caused by restoration actions might have on wildlife populations that utilize the fish as their primary food source (e.g., bald eagles, ospreys) should be included.	Yes	0
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 plan adequately identifies the key ecological functions for species within the subbasin.	Yes	0

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 adequately addressed limiting factors.	Yes	0
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: The document includes a synthesis section that is very well done and informative.	Yes	0
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: The plan adequately addresses key assumptions and uncertainties.	Yes	0
	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: The Assessment was well done, especially the synthesis portions. Some of the key elements are well organized in tables, both here and in the other sections of the document.	Yes	0

II. The Inventory		
<i>(This checklist section was developed from pages 11-12 of the Technical Guide.)</i>		
<i>Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin inventory, specifically whether the inventory includes an assessment of the adequacy of current legal protections, plans, and projects to protect and restore fish, wildlife, and ecosystem resources. Does the inventory adequately synthesize past activities and their biological achievements? Planners were requested to, as applicable, describe the extent to which these programs and activities extend beyond the subbasin to a larger scale (provincial and basin-wide).</i>		
	(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
II.A. Existing Protection		
II.A.1	Does the inventory identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?	

<p>Reviewers: Much of the land in the subbasin is owned by either the Park or Forest Service, or by Chelan County. The plan should better describe what is being and has been done about the effects of past burns on riparian areas. Is there salvage logging, and if so, what are the implications of this activity for fish and wildlife?? No section of this plan directly states which areas have existing protections.</p> <p>The Inventory component of the plan has a list of current restoration programs that are being funded by various groups. It often mentions stream buffers as a near-term restoration opportunity. The summary of restoration measures on pages xv-xvi is a list of goals and does not include an examination of what is already being done. There is no section heading or section that deals with this directly.</p>	<p>Partial</p>	<p>2</p>
<p>II.A.2</p>	<p>Does the inventory assess the adequacy of protections for fish, wildlife, and ecosystem resources?</p>	
<p>Reviewers: The Forest Service has done watershed analysis aimed primarily at erosion control and riparian health. The plan should at least describe the results of their analyses and management recommendations. The inventory is only described through bullet points and tables. The adequacy of the programs is not assessed.</p>	<p>Partial</p>	<p>2</p>
<p>II.B. Existing Plans</p>		
<p>II.B.1</p>	<p>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?</p>	
<p>Reviewers: Although the existing plans are covered in the Management Plan section, this information should be provided in the Inventory section along with some review.</p>	<p>Partial</p>	<p>2</p>
<p>II.B.2</p>	<p>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.)</p>	
<p>Reviewers: The Inventory section provides a list of programs and projects being implemented in the subbasin but gives little detail about these efforts. There is no explicit discussion of the extent to which existing projects and programs address issues identified in the Assessment. Some of this information can be gleaned from the table, but the treatment is incomplete.</p> <p>This plan's focus on restoring native fish and fauna is commendable. However, there could be a disconnect between this subbasin plan's focus on native fish species such as the west slope cutthroat trout and an existing WDFW stocking program that focuses on Chinook salmon, rainbow trout, and other species.</p> <p>The reviewers raised a question whether kokanee is a species native to Lake Chelan because they were introduced to Lake Chelan in 1917, according to Brown, L.G. 1984. Lake Chelan Fishery Investigations. Washington Dept. of Game and P.U.D. No. 1 of Chelan County, WA, Wenatchee, WA.238 pp.</p>	<p>Partial</p>	<p>2</p>

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: The tables were good.		Yes 0
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 tables were good.		Yes 0
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 target of the activity is usually identified, but the target is not necessarily a limiting factor identified in the assessment. Some of the targets may not have been especially limiting.		Partial 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 plan summarizes accomplishments and failures of activities; however, it does so briefly in the table and some of the information is too brief to be very informative. More information would be helpful. That said, many plans had difficulty with this section and could benefit from reviewing the table in this Inventory as an example of how this information can be compiled in an understandable manner. However, the other plans should be aware that we felt that additional material would be required to produce a complete Inventory section.		Yes 1
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: This question is addressed only in a very cursory manner in the Inventory. Information gaps are identified in the RME section as a mechanism for providing guidance for future evaluation efforts. However, no comparable identification of gaps between current management actions and the limiting factors from the Assessment is provided.		Partial 2
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).		

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?

Reviewers: The tables in this section provide a good synopsis of projects. A more detailed description of the projects and their relationship to limiting factors identified in the Assessment would be useful. Some of this information is presented in the introduction as sources material for the subbasin plan.	Yes	1
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<p>III. The Management Plan <i>(Derived from pages 12-16 of the Technical Guide.)</i> <i>Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin management plan.</i></p> <p>These checklist tables incorporate Council Question 4, Consistency with the Provincial- and Basin-level Program: Are the vision, objectives, and strategies proposed in the subbasin management plan consistent with those adopted in the program for the province and/or basin levels? This is a three-part question and reviewers must be familiar with the vision, objectives, and strategies described in the 2000 Fish and Wildlife Program (pp. 13-33) and, for mainstem subbasin plans, the Mainstem Amendments (pp.11-28).</p>		
<p>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):</p>	<p>(Y)es, (P)artial, (N)o</p>	<p>Need for additional treatment (0-4)</p>
Reviewers: The vision is brief and generic but is similar to the visions articulated in many of the other subbasin plans.	Yes	0
<p>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?</p>		
Reviewers: There is a section in the Management Plan that provides biological objectives for terrestrial and wetland habitats. A comparable treatment is not provided for stream or lake systems or for the focal species in this section. However, some of this information is provided in the very good Interpretation and Synthesis section and the biological objectives are covered in some depth in the RME section. The information is covered adequately but in a somewhat different format from many of the other plans.	Yes	0
<p>III.B.1. Are the biological objectives consistent with basin-level visions, objectives, and strategies adopted in the program? (Council Question 4) The 2000 Fish and Wildlife Program, pages 16-18, provides general descriptions for basin-level goals, objectives, and strategies. The Mainstem Amendments provide additional biological objectives as well on pages 11-14.⁷</p>		
Reviewers: The biological objectives are consistent with basin-level visions for the terrestrial and wetland habitats. There are none provided for the aquatic systems or focal species. (See comment on previous question.)	Parti	1

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.

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: The biological objectives are based on the subbasin assessment for those elements for which objectives are provided.	Partial	1
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: There is good amplification in text and outlines, especially the RME section, although the information in the tables was not very specific. Some objectives could be stated more explicitly. For example, sport catch rates of kokanee are given for periods before and after effects of mysids, lake trout, and other introductions. A range of desired values might have been provided as targets to fit the vision. As it stands there is no yardstick for measuring success.	Partial	1
III.B.4. Are biological objectives identified for both the short and long-term?		
Reviewers: Near-term opportunities are clearly spelled out. However, the rest are not really broken down by term.	Yes	1
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: The objectives seem to be generally complementary, but they were not explicitly analyzed or discussed. Also, they do not describe the monitoring of pesticides of other chemicals in the plan.	Partial	1
III.B.6. <i>Clean Water Act</i> : Does the management plan describe how the objectives and strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule within that particular state? I.e., does this subsection of the management plan assess and describe the consistency-coordination-findings of the Water Quality Plan with the subbasin plan? ⁸		
Reviewers: The only mention of TMDLs in the plan is in the Inventory section where the TMDL for phosphorus delivery to Lake Chelan is described. Apparently, this is the only TMDL in the subbasin. There is no mention in the Management Plan about consistency with TMDL requirements. This point could be covered with a few sentences in the Management Plan section that indicates that the planned actions are not likely to impact phosphorus delivery to the lake. Also see comment above.	Yes	0
III.B.7. <i>Endangered Species Act</i> : The USFWS and NOAA Fisheries are developing recovery plans for listed species (bull trout, white sturgeon, salmon). Recognizing that those ESA-based efforts are in various states of completion across the Columbia basin (some efforts are well underway, others just beginning), does the management plan describe how the objectives of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin? ⁹		

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.

Reviewers: Among the aquatics, bull trout is the only listed species, and it is probably extirpated. The resident Chinook salmon stocked in the lake for recreational fisheries are not part of the Upper Columbia ESU.	Yes	0
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.)		
Comments: If there were disagreements, they were not discussed.	na	na

III. C. Strategies¹⁰		
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 strategies are covered primarily in the RME section, although some discussion of strategies for terrestrial and wetland habitats is contained in the Management Plan. In the RME section the authors do a very nice job of describing the linkages between the strategies, objectives and the Assessment.	Yes	0
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's consistency with the Fish and Wildlife Program is adequate.	Yes	0
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		

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 strategies are presented as a starting point for further discussion to select among various strategies - as a laundry list without pros and cons discussed for each strategy. The strategies follow a logical path and are linked to limiting factors and objectives. (It can be inferred that there are alternatives that didn't make the cut.) There was no indication of the level of buy-in of the strategies. For example, what might be the implications to WDFW's ongoing fish stocking and management programs for recreational fisheries?	Partial	2
III.C.4. Prioritization. Does the Strategies Section describe a proposed sequence and prioritization of strategies?		
Reviewers: Further prioritization will be done through the state recovery process.	Partial	1
III.C.5. Additional Assessment Needs. Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		
Reviewers: Research is needed on some subjects that are identified. One example is the need to determine whether or not there may be a remnant population of bull trout in the lake.	Yes	0
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 only mention of TMDLs in the plan is in the Inventory section where the TMDL for phosphorus delivery to Lake Chelan is described. Apparently, this is the only TMDL in the subbasin. There is no mention in the Management Plan about consistency with TMDL requirements. This point could be covered with a few sentences in the Management Plan section that indicates that the planned actions are not likely to impact phosphorus delivery to the lake.	Yes	0
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 needs more detail here if it is to be used in ESA evaluations. The document states that no listed plant species have been found in the subbasin, and there are no wildlife or fish species other than bull trout, whose presence is questionable.	na	na

III.D. Research, Monitoring, and Evaluation

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

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

III.D.1	<p>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?</p>	(Yes, (P)artial, (N)o	Need for additional treatment (0-4)
Reviewers: The plan does a good job of describing a research agenda that addresses uncertainties identified in the Assessment. .		Yes	0
III.D.2	<p>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?</p>		
Reviewers: Tables are provided that show indicators that will be monitored and evaluated for each strategy for each fish species. This is an excellent way to illustrate what is needed. However, there are some inconsistencies between their hypotheses and supporting findings; e.g., hatchery fish are not showing up in the sport catch.		Yes	1
III.D.3	<p>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)?</p>		
Reviewers: Quantitative benchmarks were not included.		Partial	1
III.D.4	<p>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?</p>		

<p>Reviewers: The plan considers this issue, but no infrastructure is described. However, responsibilities are assigned to the implementing entity to collect, maintain, and make available to others the data collected in the subbasin.</p>	<p>Partial</p>	<p>1</p>
<p>III.D.5</p>	<p>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.</p>	
<p>Reviewers: The tables with agencies responsibilities are good. However, no cost estimate is given. Presumably, the way it is described, the responsible entity would include the cost in its budget.</p>	<p>Yes</p>	<p>1</p>
<p>III.D.6</p>	<p>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?</p>	
<p>Reviewers: The RME section does imply a process for refining biological objectives as new information is gathered. It does a very good job of outlining a scientifically sound logic path for addressing the key uncertainties.</p> <p>In addition, this plan does a good job of considering the ongoing need for coordination and cooperation among the developers of the plan. The plan's approach should provide a mechanism for the plan developers and implementers to consider results of research, monitoring and evaluation, as well as the need for modification of the plan's objectives and strategies.</p> <p>The tables in the plan were helpful as was the outline. The logic in the plan was clear.</p> <p>The plan should consider probabilistic and random sampling for resident fish and monitoring the spawning and rearing habitat for the fish in the streams.</p>	<p>Yes</p>	<p>0</p>
	<p>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).</p>	
<p>Reviewers: There is a lot to like about this plan. The things that matter are well considered and well presented. The Inventory provides an exhaustive list of projects being implemented in the basin but could have done a better job of relating these ongoing efforts to the Assessment and the Management Plan. The Interpretation and Synthesis is particularly helpful and clearly presented. Although it is done well, the prioritization of strategies and objectives could be more clearly presented.</p>	<p>Yes</p>	<p>1</p>

The plan has a number of grammatical and proofreading errors that need attention. See the Editorial and Other Specific Review Comments section below.		
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<p>General Council Question. Consistency with the Fish and Wildlife Program and its Scientific Foundation</p>		
<p>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:</p>		
<ol style="list-style-type: none"> 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. 		
<p><i>See 2000 Fish and Wildlife Program, pages 14-15 for full detail.</i></p>		
<p>Questions on consistency with the objectives and strategies section of the Fish and Wildlife Program are incorporated in the table above. Consistency with the Program’s scientific foundation is interwoven throughout the checklist, and this comment table provides reviewers a place to specifically summarize and identify how well the eight principles were addressed.</p>		
<p>Summary comments and evaluation of the subbasin plan’s consistency with the eight principles of the Fish and Wildlife Program’s Scientific Foundation:</p>		
Reviewers: Although the Fish and Wildlife plan itself is not evaluated, this subbasin plan is quite consistent with its principles.	Yes	0

Editorial and Other Specific Review Comments

1. The document has some rough edges that should be smoothed prior to adoption by the Council as part of the Fish and Wildlife Program. For example, on page 47 a paragraph is repeated. The document retains instructions or questions addressed to the editor. Figure 7 is the wrong figure. The text says there are eight birds and two mammals that are the focal wildlife species, but only five birds are listed in the text and table. An edit for typos is needed.
2. Page 193. The tables provided in the Aquatic Section contain a good summary of the key hypotheses, strategies for resolving them, and measurable indicators that can be monitored.
3. Page 10 (Disk). The Introduction misstates the origin of subbasin planning. For the purposes here, it would be more appropriate to simply refer to the Council as calling for development of the subbasin plans. Historically, there may or may not be a connection such as is suggested in the text here. Who can say?

4. This plan provided tables that show indicators that will be monitored and evaluated for each strategy used for each fish species. This is an excellent way to illustrate what is needed. However, specific measures or how they will be obtained are given only in general terms, or in some cases, the information given simply leads to more questions about the ability to adequately measure effects of implementation of the strategy. For example a strategy for kokanee is to reduce mysid populations. The information given in Table 60 suggests that the response will be measured in terms of abundance of kokanee parr/juveniles, their distribution and size. In the text it is suggested that sampling might be conducted in four locations in the lake where previous sampling has shown both mysids and kokanee to be present. The danger here would seem to be what is already discussed in the text on page 220, namely that in the West Arm of Kootenay Lake it was found that mysids did not compete with kokanee - unlike the experience elsewhere. This is an example illustrating the need for more in-depth thought to be given to the monitoring phase. Whether that needs to occur at this stage of development of the plan or later, is a point for broader discussion. The question here is whether the four areas chosen can be considered to be random samples, measurements from which can be expanded into estimates for the lake as a whole. The information given in this subbasin plan goes beyond many other subbasin plans.

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