

# Upper Columbia Mainstem

## Review Summary

The Upper Columbia Mainstem Subbasin Plan meets most of the scientific elements of a subbasin plan as described in the Council's 2000 Fish and Wildlife Program and Subbasin Planning Technical Guide. Some elements of the plan would benefit from additional treatment, but the reviewers' concerns are not insurmountable.

A notable strength of the subbasin plans in the Intermountain Province is their consistency and direct linkage to the Fish and Wildlife Program and its base principles; however, the planners' focus on objectives and strategies they feel are most consistent with Bonneville's mitigation responsibilities detracts from the ecological approach that is central to the base principles. This is a particular problem in the terrestrial sections.

## Assessment

The subbasin overview, along with information from the Provincial Plan Assessment, provides a good basis for the subsequent sections of the plan. Discussions of environmental conditions and focal species and habitats contain appropriate detail relevant to resource restoration.

There is much good detail in the aquatic section both by focal species and subarea, and in the terrestrial section by focal habitats and species. It would be helpful to have a summary section that pulled it all together. Interpretation and synthesis is provided in the terrestrial section, and would be a useful addition to the aquatic one. The Assessment is reasonably complete, with the exception of the Inter-species Relationships section.

The selection of Chinook salmon and lamprey as focal species seems illogical because they no longer exist in the subbasin and prospects for their reentry are slim in the foreseeable future. The presumption is that the dams will stay in place, and other passage strategies are not well developed.

The Assessment presents a reasonable description of focal species' status, to the extent that information is available. The only species where more could have been done were bull trout and west coast cutthroat trout. Aquatic species are covered more extensively than terrestrial species. Out-of-basin effects are not adequately addressed for fish or migratory wildlife. If anadromous species are considered for reintroduction, then out-of-basin effects on the species should be assessed relative to potential production in the subbasin.

Overall, the interaction between environmental conditions and aquatic focal species' status is well described with good detail and discussion. Limiting factors are described for each focal species. QHA is used for white sturgeon, kokanee, and rainbow and redband trout. Passage obstructions within the subbasin are identified as the major limiting factor for these species. Lamprey and Chinook, currently extirpated, are not assessed using QHA.

## **Inventory**

The Inventory provides a good description of ongoing management programs, their accomplishments and the gaps in coverage, but description of current protection measures for fish is lacking. The assessment of gaps between past and current actions and those needed to address the limiting factors and meet recovery and other goals is done systematically for aquatic species, including an identification of areas needing attention. Gaps for terrestrial species are addressed through the dam construction mitigation HU targets. The overall impression of the Inventory is that it is thorough, but it is too much a list of activities and too little a synthesis of what is being done for the resources.

## **Management Plan**

The Management Plan is sound and thorough, with the exception of the research, monitoring and evaluation (RME) section. Prioritization of objectives in the terrestrial section, which is only partially complete, is a good start. The plan is strong on specific objectives and strategies that address the limiting factors identified in the Assessment and are consistent with province and basin-level objectives. The overall plan needs to have a more ecological outlook. Its objectives are sound, but its strategies need to be beefed up and extended into plans for adaptive management.

Most of the plan's biological objectives are written in specific, measurable terms and link to the province and subbasin goals and objectives. For terrestrial species, focus is on completing mitigation HUs, but strategies are also prioritized. The prioritization done thus far is a major accomplishment.

The RME plan would be more useful if its tabular material was accompanied by more explanation in the text. The research section flowed more from the Management Plan than from the Assessment and Inventory; it should link back to the latter two sections more clearly. The monitoring plan is a good beginning, but more work is needed on coordinating standard protocols, plans for cooperative monitoring; definition of monitoring indicators and development of infrastructure for RME quality assurance, data management/analysis, reporting, and archiving. Adaptive management is not addressed in the RME plan.

The past management in the Upper Columbia Subbasin has emphasized stocking of hatchery-produced fish, but the main priority in this Management Plan is on habitat.

# Review Checklist

<p><b>I. The Subbasin Assessment</b>          (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.</p>		
<p><b>I. A. Subbasin Overview</b>  <i>General Question to be addressed: Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin? The Council specifically asked that the independent scientific review evaluate whether the subbasin assessment was thorough and substantially complete. The following checklist is to aid reviewers in that determination.</i></p>		
<p><b>I. A.1. General Description</b></p>		<p>(Y)es, (P)artial, (N)o</p> <p>Need for additional treatment (0-4)</p>
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)?	
<p>Reviewers: A good general orientation to the subbasin is provided in the subbasin plan as well as in the provincial plan. Descriptions of the subareas are brief but illustrative of the integration of human uses and physical features. This overview could be more extensive to give readers a more thorough understanding of the subbasin's conditions.</p>		
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)?	
<p>Reviewers: The description of the subbasin's macro-environment is adequate, but brief. It has more detail on water resources and soils. Less information is provided about vegetation. Overall, it could have been more extensive to give readers a more thorough understanding of the subbasin's conditions.</p>		
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)?	
<p>Reviewers: The plan's anthropogenic disturbances are described by drainage area. Its discussion of land uses is much too brief.</p>		
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 lists forty-seven native and nonnative aquatic species. Some description of their distribution and uses over subareas is presented. This information is not included in the Upper Columbia Subbasin overview section of the Assessment, but it is in the species characterization section and the IMP Plan.			
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 plan utilizes the list of plants found in the IMP Plan in Table 4.3. Native plants are mentioned but not emphasized.			
<b>I.A.2. Subbasin in the Regional Context</b>		<i>(Y)es, (P)artial, (N)o</i>	<i>Need for additional treatment (0-4)</i>
I.A.2.1	Does the assessment adequately 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 subbasin Assessment provides an adequate description of the subbasin. Linkages between this subbasin and other subbasins, the province and the region are addressed well in the provincial plan.			
I.A.2.2	Does the assessment adequately 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 <b>units.</b> <sup>1</sup> ) where this information was available during the planning process?		
Reviewers: ESA planning units are referenced in the terrestrial section. The plan should have included more detail on bull trout and westslope cutthroat habitat.			
I.A.2.3	Does the assessment adequately 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: External environmental conditions are adequately described in the subbasin Assessment and in the provincial plan.			
I.A.2.4	Does the assessment adequately 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 long-term trend data are only partially addressed (for about a ten year projection) in the IMP Plan, and center on the assumption that as long as the hydroelectric dams remain, their deleterious effects will continue and fish and wildlife resources will diminish. Human influences			

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

are adequately described in the overview of the IMP plan.			
<b>Summary comments and evaluation on the Subbasin Overview:</b>			
Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin?			
Reviewers: The subbasin overview, along with information from the Provincial Plan Assessment, provides a good basis for the subsequent sections of the plan. In a future draft, the Upper Columbia Mainstem Subbasin Plan would benefit from citing some of the detailed demographic and environmental information found in the IMP plan. The combined discussions of environmental conditions and focal species contain good detail relevant to resource restoration.			

<b>I.B. Species Characterization and Status</b>			
<i>General question: Does the assessment adequately describe the current status of fish and wildlife focal species?</i>			
Note to reviewers: for this section of the review, the checklist should be applied to each focal species. Please identify which species your evaluation applies to in the comment field. Use the ranking fields (Y,P,N; 0-4) to give an overall evaluation across all focal species. Note differences among approaches to species in the comment field. If necessary, once the plans are received, assignments will be made to cover an individual species or a series of focal species.		(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
I.B.1. Does the assessment adequately identify a series of focal species that will be used to characterize the status of fish and wildlife species within the subbasin? These should include one or more wildlife, resident fish, and, where present, anadromous fish species. Anadromous fish may also be included in subbasins where they were historically present and where there is a reasonable probability that these fish could be restored to sustainable levels. Criteria suggested for selecting focal species include a) designation as Federal endangered or threatened species, b) local ecological significance, <sup>2</sup> and c) cultural significance.			
Reviewers: Aquatic focal species are the white sturgeon because of its ecological, cultural and economic importance; redband/rainbow trout because of its recreational and subsistence values and ecological significance; kokanee salmon because of its economic, cultural and genetic importance; Chinook salmon because of its cultural and recreational value, and for the reintroduction of a native species; Pacific lamprey because of its cultural and subsistence value and native species conservation; burbot because of its ecological significance, and potential recreational value. For terrestrial species, four focal habitats are identified: wetlands, riparian and riparian wetlands, steppe and shrub-steppe, and upland forest. A reasonable description of each is presented. Twenty priority species are listed; among them seven are listed under the ESA. Brief descriptions of each are presented. There is no explicit discussion of the availability of data to monitor focal species. Many appear to have limited data available. More attention could have been given to native bull trout and westslope cutthroat			

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

trout.		
I.B.2. Does the assessment adequately 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: Focal species populations are well described for all aquatic species to the extent that information is available. Terrestrial species are less well described.		
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: A good description of what is known about the life history stages, historical status, current status, distribution and management of white sturgeon, redband/rainbow trout, kokanee salmon, Chinook salmon, Pacific lamprey and burbot is offered. Very brief descriptions of terrestrial species are provided.		
I.B.4. Does the assessment adequately describe the population's life history, including identifying distinct life stages?		
Reviewers: Life history stages are adequately described for aquatic species, but not for terrestrial species. The plan could be more detailed on the life-stage habitat needs of redband and rainbow trout.		
I.B.5. Does the assessment adequately 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: The Assessment adequately presents genetic information as known.		
I.B.6. Does the assessment adequately describe historic and current harvest, including both in-subbasin harvest and downstream or ocean harvest affecting the focal species?		
Reviewers: Economic data from nine years of creel surveys is summarized for rainbow trout. Harvest data is also provided for grouse and deer. Additional information on effects of out-of-basin harvest on white sturgeon should be added.		
	<b>Summary comments and evaluation on the Species Characterization and Status Subsection:</b> Does the assessment adequately describe the current status of fish and wildlife focal species?	
Reviewers: The Assessment appears to be a reasonable description of focal species status, to the extent that information is available. The species where more could have been done are bull trout and west coast cutthroat trout.		

**I.C. Environmental Conditions**  
*General question to be addressed: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?*

<b>I.C.1. Environmental Conditions within the Subbasin</b>		(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
I.C.1.1	Does the assessment adequately describe the current condition of the environment in this subbasin, and characterize the condition of the environment under the following reference conditions: a) historic, <sup>3</sup> b) potential, <sup>4</sup> c) future/no new action, <sup>5</sup> and the potential condition of aquatic and terrestrial habitats within the subbasin? Does the assessment include a determination of the difference between current conditions and the various reference conditions?		
Reviewers: The Assessment adequately describes the subbasin's historic and current environmental conditions by subarea, but it does not include a discussion of potential environmental conditions with and without action. QHA is performed for three aquatic focal species, providing a comparison between existing and reference conditions in the focal species section. There does not appear to a comparison of future/no new action scenarios.			
I.C.1.2	Does the assessment adequately classify 6 <sup>th</sup> field HUCs within the subbasin according to the degree to which each area has been modified and the potential for restoration?		
Reviewers: QHA was used to analyze stream reaches. IBIS was used for current wildlife. Road density is considered in these units.			
<b>I.C.2. Out-of-Subbasin Effects and Assumptions</b>			
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: The plan offers a brief general discussion of out-of-basin effects pertaining to all species in the subbasin; it cites the hydroelectric system as the major out-of-basin effect. The discussions of focal species include identification of some out of subbasin effects. More information should be available for out-of-basin effects on wildlife. If anadromous species are considered for reintroduction then out-of-basin effects on the species should be assessed relative to potential production in the subbasin.			
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: The plan does not establish any assumptions about the impact of out-of-subbasin effects on the sustainability of fish and wildlife in the subbasin. Perhaps this issue could be discussed for wildlife.			

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

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

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

<b>I.C.3. Environment / Population Relationships</b>		
For each focal species, does the assessment adequately 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 adequately 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 provides a reasonable description of the environmental factors by area, and for each species the important environmental conditions are identified.		
	<b>Summary comments and evaluation on the Environmental Conditions Section:</b> Does the assessment adequately describe the effect of the environment on fish and wildlife populations?	
Reviewers: Overall, the interaction between environmental conditions and aquatic focal species status is well described with good detail and discussion. The out-of-basin effects are not adequately addressed. If anadromous species are considered for reintroduction then out-of-basin effects on the species should be assessed relative to potential production in the subbasin.		
<b>I.D. Ecological Relationships</b>		
<i>Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?</i>		(Y)es, (P)artial, (N)o  <i>Need for additional treatment (0-4)</i>
<b>I.D.1. Inter-species Relationships</b>		
Does the assessment adequately 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: Interspecies interactions and ecological effects are addressed indirectly in the focal species sections. Overall, almost nothing about inter-species relationships is included in the plan, but some of this information is included in the Province Overview.		
<b>I.D.2. Processes and Functions</b>		
Does the assessment adequately identify key ecological functions for species within this subbasin and assess the current status of ecological processes and functions in the subbasin?		
Reviewers: Key ecological processes and functions are discussed indirectly in the focal species and limiting factors sections, but they are not explicitly addressed as key ecological functions or processes. The ecological role of fishes should be presented better.		

<b>I.E. Interpretation and Synthesis / Limiting Factors and Conditions</b>		
<b>I.E.1. Limiting Factors and Conditions</b>		
Does the assessment adequately describe: <b>1) Historic factors or conditions</b> that led to the decline of each focal species and of ecological functions and processes? <b>2) Current key factors or conditions</b> within and without the subbasin that inhibit populations and ecological processes and functions relative to their potential.		
Reviewers: Limiting factors are described for each focal species. QHA is used for white sturgeon, rainbow/redband trout and kokanee. Passage obstructions are identified as the major limiting factor for these species. Lamprey and Chinook salmon, currently extirpated, are not assessed using QHA. Little appears to be known about burbot.		
<b>I.E.2. Key Findings</b>		
Is the knowledge gained through the assessment adequately 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 Assessment contains individual sections that are good descriptions of individual components of the key findings, but could use some summary tables or concluding remarks to address higher-level issues regarding the health of the ecosystem overall and the potential conflicts and compatibilities between individual species and ecological processes.		
<b>I.E.3. Subbasin-wide Key Assumptions/Uncertainties (“Working Hypothesis”)</b>		
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 guiding principles and working hypotheses were developed at the provincial level, in an explicit attempt to integrate and provide consistency across subbasins.		
	<b>Overall impression and evaluation of the Assessment:</b> Does the assessment adequately synthesize the information regarding the health and functioning of this subbasin ecosystem? Does it adequately: a) bring together the single-species and community assessments to form a holistic view of the subbasin’s biological and environmental resources, b) provide a foundation for the development of scientific hypotheses concerning ecological behavior and the ways that human intervention might prove beneficial? As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please comment here (e.g., socio-economic descriptions or analysis).	

Reviewers: There is good detail in most of the Assessment, presented by focal species and subarea. The species where more could have been done are bull trout and west coast cutthroat trout. It would be helpful to have a summary section that pulls it all together. An interpretation and synthesis section is provided in the terrestrial section; this would also be useful in the aquatic section. The Assessment is reasonably complete, except for the inter-species relationships section. However, if anadromous species are considered for reintroduction then out-of-basin effects on them should be assessed relative to potential production in the subbasin.		
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<p><b>II. The Inventory</b>  <i>(This checklist section was developed from pages 11-12 of the Technical Guide.)</i>  <i>Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin inventory, specifically whether the inventory includes an assessment of the adequacy of current legal protections, plans, and projects to protect and restore fish, wildlife, and ecosystem resources. Does the inventory adequately synthesize past activities and their biological achievements? Planners were requested to, as applicable, describe the extent to which these programs and activities extend beyond the subbasin to a larger scale (provincial and basin-wide).</i></p>			
<b>II.A. Existing Protection</b>		<p>(Y)es,  (P)artial,  (N)o</p>	<p>Need for  additional  treatment  (0-4)</p>
II.A.1	Does the inventory adequately identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?		
Reviewers: Brief mention is made of bull trout, which does not have critical habitat within the UC subbasin. ESA and state protections for terrestrial focal species are described.			
II.A.2	Does the inventory assess the adequacy of protections for fish, wildlife, and ecosystem resources?		
Reviewers: The adequacy of protections for fish, wildlife, and ecosystem resources is only generally implied in the descriptions of the various management plans.			
<b>II.B. Existing Plans</b>			
II.B.1	Does the inventory identify and review applicable local, state, tribal, and/or federal fish and/or wildlife management plans and water resource management plans that affect fish and wildlife?		
Reviewers: State, tribal and federal entities are described in the provincial plan. The subbasin plan describes conservation districts.			
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 consistency of existing plans with the subbasin plan is not assessed.			
<b>II.C. Management Programs / Restoration and Coordination Projects</b>			
Does the inventory identify management programs implemented through on-the-ground restoration and conservation projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife? These include, at a			

minimum, those implemented within the past five years regardless of funding source.		
II.C.1	Does the inventory identify ongoing or planned public and private management programs or initiatives that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas? <sup>6</sup>	
Reviewers: A detailed description of ongoing projects is presented, some with descriptions of monitoring programs and performance outcomes.		
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 information requested above is provided for both aquatic and terrestrial species.		
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?	
<p>Reviewers: The Inventory only identifies limiting factors for some of the management programs. For aquatic species, a summary section addresses the extent to which ongoing projects are addressing limiting factors. Information is presented in pie charts intended to represent the proportional effort being exerted on limiting factors and “strategies”. The percentages are actually based on project counts, misleading readers when many projects are unequal in scope. Either the pie charts should be deleted from the plan or they should be revised. Money spent would more nearly represent effort or emphasis than do mere numbers of projects. The revised pie charts should then be discussed in the text with synthesis and caveats.</p> <p>For terrestrial species, the focus is on meeting the construction mitigation HUs.</p>		
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: Accomplishments are summarized for completed projects, with particular successes noted. An overall evaluation of success or failure is not presented.		
II.C.5	Does the inventory adequately 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 assessment of 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 is done systematically for aquatic species, including identification of areas needing attention. Gaps for terrestrial species are addressed through the dam construction mitigation HU targets.		

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

<p><b>Overall impression and evaluation of the Inventory:</b> As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional information or analysis beyond what is laid out above in the checklist please comment here (e.g., socio-economic descriptions or analysis).</p>		
<p>Reviewers: The Inventory provides a good description of ongoing management programs, their accomplishments, and the gaps that they do not cover, but the description of the current protection measures for fish in the Upper Columbia Mainstem Subbasin is lacking. The overall impression of the Inventory is that it is thorough, but it is too much a list of activities and too little an explanation of what is being done for the aquatic and terrestrial resources. A more complete synthesis of gaps is needed.</p>		

<p><b>III. The Management Plan</b> <i>(Derived from pages 12-16 of the Technical Guide.)</i> <i>Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin management plan.</i></p> <p>These checklist tables incorporate Council Question 4, Consistency with the Provincial- and Basin-level Program: Are the vision, objectives, and strategies proposed in the subbasin management plan consistent with those adopted in the program for the province and/or basin levels? This is a three-part question and reviewers must be familiar with the vision, objectives, and strategies described in the 2000 Fish and Wildlife Program (pp. 13-33) and, for mainstem subbasin plans, the Mainstem Amendments (pp.11-28).</p>		
<p><b>III.A. The Vision for the Subbasin</b> Does the Vision Section of the Management Plan adequately 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><i>(Y)es, (P)artial, (N)o</i></p>	<p><i>Need for additional treatment (0-4)</i></p>
<p>Reviewers: The plan utilizes a general vision statement that is developed at the province level. The province document makes frequent and explicit reference to the Fish and Wildlife Plan's vision and objectives. The Upper Columbia Mainstem vision is a slightly more specific vision nested within the IMP statement.</p>		
<p><b>III.B. Biological Objectives</b> Does the Biological Objectives Section of the Management Plan adequately describe physical and biological changes within the subbasin needed to achieve the vision?</p>		
<p>Reviewers: Most of the plan's biological objectives are written in specific measurable terms. The focus on objectives planners feel are most consistent with Bonneville's mitigation responsibilities detracts from the ecological approach that is central to the base principles of the vision and Council's FWP, particularly for the terrestrial objectives.</p>		
<p>III.B.1. Are the biological objectives consistent with basin-level visions, objectives, and strategies adopted in the program? (Council Question 4) The 2000 Fish and Wildlife Program, pages 16-18, provides general descriptions for</p>		

basin-level goals, objectives, and strategies. The Mainstem Amendments provide additional biological objectives as well on pages 11-14. <sup>7</sup>		
Reviewers: A strength of the IMP approach for aquatic objectives is the close linkage between the subbasin, province, and regional levels, as well as with overall FWP principles for the basin. Goals and objectives of the FWP are the framework within which the province and subbasin goals and objectives are developed. The subbasin Management Plan objectives are explicitly tiered to those of the higher levels of aggregation. The terrestrial section lacks the integration necessary for a holistic ecosystem assessment.		
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 Management Plan begins with a summary of limiting factors by focal species identified in the Assessment. Objectives are developed to address these limiting factors.		
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: Most of the plan's biological objectives are written in specific measurable terms.		
III.B.4. Are biological objectives identified for both the short and long-term?		
Reviewers: No explicit differentiation is made between short-term and long-term, although several objectives have target dates attached.		
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: It is difficult to tell if the plan's biological objectives are complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin. The biological objectives do make explicit reference to the Washington bull trout recovery unit.		
III.B.6. <i>Clean Water Act</i> : Does the management plan adequately 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 adequately assess and describe the consistency-coordination-findings of the Water Quality Plan with the subbasin plan? <sup>8</sup>		
Reviewers: Reference to existing TMDL monitoring and proposed TMDL strategies is made.		

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

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

<p>III.B.7. <i>Endangered Species Act</i>: The USFWS and NOAA Fisheries are developing recovery plans for listed species (bull trout, white sturgeon, salmon). Recognizing that those ESA-based efforts are in various states of completion across the Columbia basin (some efforts are well underway, others just beginning), does the management plan adequately describe how the objectives of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin?<sup>9</sup></p>		
<p>Reviewers: References to ESA recovery are adequate for bull trout, but not the westslope cutthroat trout. Relationships between this plan and ESA efforts are better described in the Provincial Plan.</p>		
<p>III.B.8. If there are disagreements among co-managers that translate into differing biological objectives, are the differences and the alternative biological objectives fully presented? (The Council's review will examine whether the plan is consistent with legal rights and obligations of fish and wildlife agencies and tribes with jurisdiction over fish and wildlife in the subbasin, and agreed upon by co-managers in the subbasin.)</p>		
<p>Reviewers: The Management Plan mentions no disagreements. The IMP comment covers this.</p>		

<p><b>III. C. Strategies<sup>10</sup></b></p>		
<p>III.C.1. <b>Internal Consistency of the Plan.</b> Does the Strategies Section of the Management Plan explain the linkage of the strategies to the subbasin biological objectives, vision and the subbasin assessment? (Council Questions 2 and 3)<sup>11</sup></p>		
<p>Reviewers: The linkages of the strategies to the subbasin biological objectives, vision and the Assessment are well made.</p>		
<p>III.C.2. <b>Consistency with the Fish and Wildlife Program.</b> Are the Strategies proposed in the subbasin management plan consistent with those adopted in the program? (Council Question 4)</p>		
<p>Reviewers: The plan's consistency with the Fish and Wildlife Program is explicitly addressed for the aquatic section. The focus on objectives planners feel are most consistent with Bonneville's mitigation responsibilities detracts from the ecological approach that is central to the base principles of the vision and Council's FWP for the terrestrial strategies.</p>		
<p>III.C.3. <b>Consideration of Alternative Management Responses.</b> Does the Strategies Section explain how and why the strategies presented were selected over other alternative strategies (e.g. passive restoration strategies v. intervention strategies)? (Council Question 5)<sup>12</sup></p>		

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

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

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

Reviewers: The plan does not provide a discussion of alternative management strategies.		
III.C.4. <b>Prioritization.</b> Does the Strategies Section describe a proposed sequence and prioritization of strategies?		
Reviewers: A systematic approach was taken to assigning priorities for aquatic species. A very good summary of subbasin priorities is presented. For terrestrial species, focus is on completing mitigation HUs. Major objectives are prioritized, but sub-objectives are not. Also, it is unclear if strategies are prioritized. The prioritization done thus far is a major accomplishment.		
III.C.5. <b>Additional Assessment Needs.</b> Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		
Reviewers: Descriptions of additional assessment needs are not included beyond QHA.		
III.C.6. <b>Clean Water Act:</b> Does the management plan adequately 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: Water quality issues and TMDL assessment are referenced in the plan. Explicit reference is made to existing TMDL implementation plans.		
III.C.7. <b>Endangered Species Act:</b> Recognizing that ESA-based efforts are in various states of completion across the Columbia basin, does the management plan adequately 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: ESA goals are explicitly addressed, but these include just a brief mention of bull trout efforts and that examination should be expanded.		

### 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,

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

Federal, and Tribal entities in response to the Basin-wide Salmon Recovery Strategy 2000 and the FCRPS 2000 Biological Opinion. Products from these regional RME efforts could be used to meet elements of a subbasin plan's RME section (Technical Guide pp. 14-16), particularly in the areas of monitoring protocols and methodologies. The subbasin plan should also explain how they incorporated existing monitoring guidance from state programs.			
III.D.1	<b>Research:</b> Does the RME section of the plan describe a research agenda with specific conditions and situations identified in the subbasin that will require specific research studies to help resolve management uncertainties? Is the research agenda framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties? Does the RME section prioritize research topics that are of critical importance to the subbasin?	(Y)es, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>
Reviewers: Because RME was covered in Intermountain Provincial Plan, the comments here are the same as those provided for all the Intermountain Province subbasins. The province plan identifies research needs. These are not prioritized within the subbasin. The RME plan is essentially in tabular form. It would make this section more useful to have more text. The tables worked better for M and E than for Research. The research could be more closely tied to the objectives. This research section flowed more from the Management Plan than from the Assessment and Inventory; it should link back to them more clearly.			
III.D.2	<b>Monitoring Objectives:</b> Does the RME subsection identify what kind of information needs to be collected in order to determine if the plan's vision and objectives are being met? I.e., what indicator variables will be monitored?		
Reviewers: The RME subsection represents substantial progress in developing an M&E plan. Monitoring types and scales are listed by strategy and objective. Specific indicators are not identified, the section tends to be very general on this. Methods are shown (inconveniently for readers) by code numbers that refer to a "tool box," which is a list of standard technical references. The methods lists shown for various objectives seem not to designate which method would be best for a specific purpose.  More work is needed on the M&E plan. There is inadequate statement of coordination for standard protocols. Evidence of progress towards cooperative monitoring of projects within the basin is lacking.			
III.D.3	<b>Monitoring Indicators:</b> Does the RME subsection identify measurable indicators of physical, chemical, biological, or socioeconomic conditions that may act as environmental signposts by which progress towards achieving the stated vision can be evaluated? E.g., does the RME subsection describe performance standards or quantitative benchmarks for reference conditions against which observations can be compared? Does the plan prioritize which indicators are most needed to answer management questions (include a short list)?		
Reviewers: No indicators are listed other than expressed or implied in the objectives. The IMP comment implies that the "tool box" identifies indicators, but the reviewers find that too indirect and unwieldy. Desired future conditions and measurable objectives should be explicitly discussed in terms of appropriate indicators.			
III.D.4	<b>Data and Information Archive:</b> Does the RME subsection describe an infrastructure to archive relevant data and meta data generated through monitoring efforts in existence for the subbasin (e.g., locally or at a regional Fish and Wildlife Program funded database such as StreamNet, the Fish Passage		

	Center, or DART)? Specifically, does the RME subsection include discussion of quality assurance/quality control (QA/QC), data management and analysis, and data reporting?		
	Reviewers: The plan describes no infrastructure for RME quality assurance, data management/analysis, data reporting, and data archiving.		
III.D.5	<b>Coordination and Implementation:</b> Does the RME subsection describe who will collect the information and data collection methods whether collection is done by a subbasin, provincial, state, or a regional entity, or a combination of entities? This should include a description of coordination with regional RME efforts in the basin (Regional Partnership, Action Agencies Research, Monitoring, and Evaluation Plan, etc) with standardization of data methods. It should also include estimates of how much the proposed M and E will cost.		
	Reviewers: Agency responsibility for RME work is not shown. The toolbox might represent a start toward coordination, but further steps are needed. Decisions need to be made on standard regional protocols.		
III.D.6	<b>Summary Question. RME Logic Path (Evaluation and Adaptive Management):</b> Does the subbasin plan provide a scientifically supportable procedure for refining the biological objectives as new information becomes available about how fish, wildlife, and the environment interact, and in relationship to how the plans are implemented over time? (Council Question 7) Specifically, does the RME subsection describe a scientifically sound logic path for how to test if the subbasin plan’s strategies are helping to reach the stated vision and objectives? I.e., Is the RME agenda adequately framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties?		
	Reviewers: Adaptive management is not addressed in the subbasin RME plan. The logic path presentations in the province plan do incorporate this, but the subbasin RME plan does not seem to refer back to this. Failure to explain how the information from M&E will be used for evaluation, and how all the M&E work outlined in this section will be used in adaptive management is a major flaw that ultimately will hamper the effectiveness of restoration and protection work in the subbasin.		
	<b>Overall impression and evaluation of the Management Plan:</b> As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please comment here (e.g., socio-economic descriptions or analysis).		
	Reviewers:  The Management Plan is sound and thorough, with the exception of the RME section and prioritization of the objectives in the terrestrial section. Objectives and strategies address the limiting factors identified in the Assessment and are consistent with province and basin-level objectives. Focus on objectives and strategies the planners feel are most consistent with Bonneville’s mitigation responsibilities detracts from the ecological approach that is central to the base principles. This is most evident in the terrestrial section. The past management in the Upper Columbia Subbasin has emphasized the stocking of hatchery-produced fish, but the main priority in this Management Plan is on habitat. The overall plan needs to have a more ecological outlook. Its objectives are good,		

but its strategies need to be beefed up and extended into plans for adaptive management.

The following are specific points:

Page 34-8 - Under "Subbasin Objective 1B2: Begin implementation of habitat strategies for addressing identified limiting factors for all focal species and native fishes," Strategy d is "Use appropriate methodologies to remove nuisance species." Nuisance species of fish? If so, this is not a habitat measure, and it belongs elsewhere in the plan. The problem is repeated in Table 34.3-1 near the beginning.

p 34-9, Subbasin Objective 1B3 - This objective is "Maintain and/or achieve stream temperatures below 18°C for all streams that support salmonid populations." Strategy 9 under this objective is "Restore sinuosity to channelized streams." How does restoring sinuosity relate to stream temperature restoration? The problem is probably repeated in the table(s) on priority.

Page 34-13 - The arrangement of Province-level and Subbasin-level objectives is confusing. Show each subbasin objective under the corresponding province objective. The same problem exists on page 34-15 and perhaps elsewhere.

In section 31 (Aquatic Inventory), Figure 31.2 may not correspond to the emphasis on hatchery programs in the text.

Page 34-24 - Here is a particularly good statement: "The Upper Columbia Subbasin Work Team ranked the aquatic objectives with the idea that the more broad and general objectives would be ranked as top priority, with more specific objectives ranked lower. The top priority objective is a broad, overarching objective to address habitat limiting factors. The Upper Columbia Subbasin has experienced a wide array of habitat problems in the mainstem Columbia River (Lake Roosevelt) and tributary streams. This objective covers a variety of habitat improvement projects that may be needed in the Subbasin. This priority aligns with the Council's FWP: "a habitat-based program, rebuilding healthy, naturally producing fish and wildlife populations by protecting, mitigating, and restoring habitats and the biological systems within them, including anadromous fish migration corridors."

**General Council Question. Consistency with the Fish and Wildlife Program and its Scientific Foundation**

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

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

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

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

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

Reviewers: A notable strength of the subbasin plans in the Intermountain Province is their consistency and direct linkage to the Fish and Wildlife Program and its base principles. The plan is generally consistent with the Council's eight principles, although it places too much emphasis on the effects of the hydropower system.

The choice of Chinook salmon and lamprey as focal species does not constitute a very ecological approach to managing fish and wildlife when the presumption is that the dams will stay in place and other passage strategies are not well developed.