

Lower Columbia and Estuary

Review Summary

The geographic scope of the Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan includes the Columbia River plume and extends 146 river miles to Bonneville Dam. The scope of the plan does not extend past the confluence of the tributaries that drain into the Columbia River, with the exception of the western-most Oregon tributaries (WOTs), including the watersheds of Youngs Bay, Nicolai-Wikiup, Lower Columbia-Clatskanie River, and Scappoose. These watersheds have been included in the plan because they are not already covered under other subbasin planning efforts. The two subbasins are within the jurisdictions of both Oregon and Washington. The states have agreed to combine the two subbasins in a single plan. The geographic area of the two subbasins aligns closely with that of the Estuary Partnership, which was asked by the Governors of Washington and Oregon to coordinate federal and state efforts to recover threatened and endangered species. The subbasin plan carries a heavy bias toward anadromous fish recovery.

In theory, the Mainstem Lower Columbia River and Columbia River Estuary Subbasin Plan is generally consistent with the scientific elements of a subbasin plan as described in the Council's 2000 Fish and Wildlife Program and Subbasin Planning Technical Guide. In implementation, however, the plan could differ from the Council's scientific elements. At the moment the strategy statements create uncertainty about the specific procedures to be followed, but the measures and research identified could form the elements of a progressive plan to assist recovery and restoration. The plan could be broadened to be an ecosystem-based subbasin plan that addresses the subbasins beyond anadromous issues. The planners feel that these subbasins are unique to all others in the Columbia River Basin because they are located at the river's end.

The plan needs to be organized according to the Council's format from the technical guide. Currently, the plan contains a greater level of detail and overall consistency than many other subbasin plans, but its organization is so confusing that reviewers could not find key pieces of information in the document and its appendices. A thorough analysis of the plan's organizational shortcomings is included at the end of the checklist.

Assessment

The plan's emphasis on anadromous species has created an Assessment that is thorough for them, but weak for other species. The "analyses" that are conducted, however, are well presented and once the organization is discerned the logic process can be followed. Adding text describing the QHA analysis and condensing the hypotheses would augment the Assessment.

The Assessment offers a generally adequate overview of the subbasin. The plan provides a good history of land and water uses in the subbasin, but its description of current uses is thin. Because the river and estuary are heavily developed, competition with existing human activities will be an issue for any restoration activity, so the omission of descriptions of land use and population projections is significant. A significant feature of the ecosystem is the abundance of hatchery fish that annually migrate through the system. The information presented tends to be of total returns of wild and hatchery adults; there is essentially no data on the number of hatcheries and releases.

The mainstem Columbia River between Puget Island (upper estuary) and Bonneville Dam remains largely un-assessed even after this process. This limitation has been identified before but it still persists. Approximately 100 miles of river is either a gauntlet common to all up-river and Willamette River salmonids, or could be viewed as a hundred miles of restoration opportunities. At this time there is apparently insufficient information to assess the importance of this large and highly modified subbasin.

This plan's presentation of historic and current limiting factors differs from that of other subbasins. In this case, the authors conducted the Assessment and then prepared a series of working hypotheses that "collectively represented our current understanding of the primary issues in the estuary and mainstem" (this is also done for the WOT). The hypotheses complete the Assessment sections and then lead to tables of limiting factors that are included in the Management Plan chapter. Limiting factors for anadromous species include severe channelization in the lower mainstem, the resulting subsequent loss of backwater habitat, and riparian degradation. An equally detailed examination of limiting factors for terrestrial focal species would strengthen this plan.

Inventory

The Inventory section is hard to read and does not include the information requested, although much of this information appears in the Management Plan. The Inventory needs to be reorganized to compare current programs and projects with the limiting factors identified in the Assessment. A concise comprehensive Inventory would be useful for generating project solicitations and for developing and reviewing proposals. In addition, further effort on the Inventory could lead to a better understanding of the system.

The subbasin plan makes a start at relating the Assessment to existing activities and identifying the gaps between past actions and actions needed to meet recovery and other goals of the Management Plan. In the introduction to the Inventory, the authors note that a database of projects and programs had been compiled and could be queried for additional information. A more empirical assessment of projects and assessment outcomes could have been developed. Without such a link, reviewers are unable to identify critical uncertainties or to accurately assess how completely they are being addressed by ongoing projects.

Management Plan

The Management Plan includes the best content of the subbasin plan, but the logic path is difficult to follow and the biological objectives should be clarified. The information is embedded in the plan, but the overall presentation should be re-organized for readability and clarity.

Additional focus on the mainstem, Portland, Vancouver, Astoria, etc. would strengthen the plan. The needs of the non-anadromous species would benefit from more attention, as the present plan fails to address management of anything but anadromous stocks. There also remains a significant role for research in these subbasins and a continued need for a full habitat inventory and assessment in the fluvial mainstem. The reviewers note the need for greater research emphasis on the mainstem portion of the river is consistent with previous ISRP comments.

The plan relates each strategy to one or more objectives and describes how it would be implemented by one or more measures (or actions). Strategies are related to the subbasin Assessment via the objectives and limiting factor analyses. Strategies are "tiered" according to their ability to address key objectives, relationship to the ESA, relationship to focal species of the subbasin, and socio-economic considerations as stated in the vision. The measures should get to a more useful level than "No net loss," which is a goal, not a strategy. The plan's strategies are prioritized only at a general level, without a clear identification of the few highest priority actions.

Research, monitoring, and evaluation (RME) efforts that are developed specifically to implement this subbasin plan are included as part of the LCFRB Lower Columbia Salmon and Steelhead Recovery Plan. The subbasin plan states that this, along with substantial ongoing RME planning efforts, can be used to evaluate this plan's strategies and measures. However, the subbasins will need more focused RME programs. The basins have many species of value and host all upriver salmon production, but the focus on the mainstem and, until recently, estuary habitats has been inadequate. The implementation of a comprehensive RME program could be very expensive. The plan's RME logic path and its adaptive management component are found in Chapter Eight Volume One of the LCFRB report.

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 <i>Need for additional treatment (0-4)</i>
I.A.1.1	Does the assessment provide a general orientation to the subbasin (location, size, distinguishing natural and cultural features, land use, land ownership) and an overview of jurisdictional authorities (state, county, federal lands, tribal lands and fishing rights)?	
Reviewers: The scope and emphasis of the Assessment reflects the lead entities: the Lower Columbia River Estuary Partnership (LCREP) in partnership with the Lower Columbia Fish Recovery Board (LCFRB). The Estuary Partnership worked closely and directly with the LCFRB. The Assessment offers a narrative on salmonid (some reviewers wonder if this included the NOAA paper "Salmon at River's End") histories, however, its coverage of jurisdictional information is cursory, and it omits cultural uses. An historical narrative provides some of the overview		Partial 2

<p>information. Inadequate information is provided on the people living in the subbasin and the current and future development likely to take place.</p> <p>This portion of the plan could be improved by integrating the myriad documents contained in the plan in the format laid out in the Council's technical guide. Much of the necessary information is present, but it is not organized or expressed in a usable fashion. The eleven postulates should be paced after the vision and incorporated more fully. The plan should explain how these broad principles apply to these very disparate areas so they become referential to a recovery plan. As it is, there is no process for applying the principles to a specific area, whether it is the estuary, the lower Columbia Mainstem, or the Coweeman. The working hypotheses are postulates; exploring these assumptions could provide the needed supporting text.</p>			
I.A.1.2	<p>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>	Yes	0
<p>Reviewers: The subbasin's physical setting is summarized in a reasonable way. A good description of the physiographic zones of the lower Columbia and estuary is given. A list of "areas of biological significance" is provided without explanation. A good description of the hydrology, sediment transport, salinity, flow, climate and channel confinement, contaminants and ongoing restoration efforts is provided. The plan would be augmented by the inclusion of a better map of the estuary with reference to Bonneville and the mainstem. The area is difficult to describe, but a sequence of clear maps identifying major streams and other points of interest would be beneficial. To improve the clarity of illustrations, authors should avoid using shading that does not have adequate contrast in pdf files.</p>			
I.A.1.3	<p>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>	Partial	2
<p>Reviewers: A good summary of the environmental-economic development of the lower river is provided. Major land uses are summarized in a cursory way in a short historical context. Providing more details would strengthen this portion of the Assessment.</p>			
I.A.1.4	<p>Does the assessment provide a list of native and non-native fish and wildlife species present in this subbasin including those species that:</p> <ul style="list-style-type: none"> 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? 		

<p>Reviewers: The Assessment provides a good habitat description. A list of all of the fish and wildlife species found in the area is included; however, indication of whether species are native or nonnative, have special ecological importance, or cultural significance to American Indians is not included. There are large sections covering non-native species later in the plan, but mentioning them here would make the plan more readable.</p> <p>Habitat types are also described according to different assessments. A table presents summary information about habitat types identified using four different methods.</p>	Yes	2
I.A.1.5	Does the assessment identify plants that have been designated as threatened or endangered under the Federal Endangered Species Act or state equivalents, and/or that are recognized by Native American tribes as having special cultural or spiritual significance, or (optional) that have special ecological importance within the subbasin?	
<p>Reviewers: The best general discussion of plants is in a section on exotic species. Covering terrestrial plant species along with aquatic species would augment this portion of the plan. Organizing information on plants according to the outline of the Council’s Technical Guide would make the plan more readable and consistent.</p>	Partial	2
I.A.2. Subbasin in the Regional Context		<i>(Y)es, (P)artial, (N)o (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)?	
<p>Reviewers: The Assessment places the subbasin in a regional context with maps and a summary description. Additional information is provided throughout the plan. Providing more details and condensing the information into one section would make this plan stronger.</p>	Yes	1
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?	
<p>Reviewers: The Assessment describes the subbasin’s relationship to the ESA based on historical information rather than current stock assessment (there is not a stock assessment program in place). The only long-term assessment concerns hatcheries. The subbasin does have seine surveys on Jones Beach. There is a heavy emphasis on the listed stocks that use the mainstem for passage and the estuary for rearing and acclimation. There is also reference to the BiOp RPAs that relate to estuary restoration. All of this is again provided in several locations throughout the text.</p>	Yes	

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.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)?	Yes	0
<p>Reviewers: The Assessment states that an ecosystem-based approach is desired but not possible because of a lack of data. More data are available for the estuary than for the mainstem. A more detailed discussion on the open ocean would further enrich this portion of the Assessment. There is an excellent discussion of hydrology, sediment transport, salinity, etc. Reviewer evaluation of this question recognizes the limitations of available data.</p>			
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)?	Partial	3
<p>Reviewers: The Assessment adequately identifies trends with regard to in-river water, ocean and estuarine productivity. The plan offers no information on human projects, shipping (dredging implications), or future demographic projections. The plan would be strengthened by identification of population projections for Astoria, trends in land use along the mainstem, mainstem issues near Portland, etc., and discussing how these will affect the Estuary and Lower Columbia. Reviewers consider these to be notable omissions that are critical for the development of any forward-looking Management Plan.</p>			
<p>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?</p>			
<p>Reviewers: The Assessment offers a generally adequate overview of the subbasin but is missing key information. Because the river and estuary are heavily developed, competition with existing human activities will be an issue for any restoration activity, so the omission of descriptions of land use and population projections is significant. The plan provides a history of land and water uses in the subbasin, but its description of current uses is thin. The mainstem from Bonneville to the estuary is not adequately considered. This evaluation is largely based on the estuary and mainstem, but similar issues relate to the WOT also, but at a more local scale.</p>		Partial	3

<p>I.B. Species Characterization and Status</p>			
<p><i>General question: Does the assessment adequately describe the current status of fish and wildlife focal species?</i></p>			
<p>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</p>		<p>(Y)es, (P)artial, (N)o</p>	<p><i>Need for additional treatment (0-4)</i></p>

series of focal species.		
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.		
<p>Reviewers: The Assessment identifies four Pacific salmon species, winter and summer steelhead, Pacific lamprey, green and white sturgeon, plus the bald eagle and the Columbia white-tailed deer as focal species. Table 2-4 identifies the reasons for their selection, plus thirteen more species of special/other interest. The large number of focal species makes these sections very long and detailed. Focal species are selected based on four criteria: ESA status; cultural importance of the species; level of species' life histories information available; life histories representative of the use of Mainstem Lower Columbia River and Columbia River Estuary subbasin.</p> <p>The subbasin plan is very salmon-centric. The justification for this is that the ocean-type and stream-type salmonids play a major role in the structure and content of the subbasin because of their importance to all of the selection criteria. It is also argued that less attention to the non-anadromous species is required because well-developed recovery or management plans already exist for the bald eagle, Columbia white-tailed deer, pacific lamprey, and the green and white sturgeon. Even if this is true, the identification of a mainstem focal species could be important to the Assessment and management of mainstem and estuary habitat in the future. Reviewers would recommend consideration of identifying species to meet this need.</p> <p>The reasoning behind the assertion that these subbasins are unique compared to all other subbasins because they are located at the river's end is not strongly supported by reviewers. Is this true also for the WOT basins? However, their uniqueness may be due to their size and dynamic and changing environments. There are a number of reasons for their value and uniqueness, but location seems a lesser point.</p>	Yes	1
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: Brief descriptions of focal species populations are incorporated into the Assessment. The reader is referred to the Technical Foundation and Management Plan Supplement for full descriptions. Some of the focal species are included in the Assessment, but not discussed in the Technical Foundation section. Others are discussed in the Technical	Yes	

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.

Foundation section, but not included in the Assessment. Altogether, the examination is not complete in either place. An organized, consistent and thorough examination of focal species is required for the plan, as are brief statements concerning their relative abundance.		
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: The Assessment offers good overview summaries with maps of distribution of the anadromous focal species. Adding more detail for other species would further enrich this part of the Assessment.	Yes	1
I.B.4. Does the assessment describe the population's life history, including identifying distinct life stages?		
Reviewers: The Assessment analyzes life history in the plan and provides more detail in the appendix.	Yes	1
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: Genetic information is not presented in the Assessment; it is located in Appendix One. A significant feature of the ecosystem is the cumulative numbers of hatchery fish that migrate through the system. The information presented tends to be of total returns of wild and hatchery adults; there is essentially no data on the number of hatcheries and releases.	Yes	2
I.B.6. Does the assessment describe historic and current harvest, including both in-subbasin harvest and downstream or ocean harvest affecting the focal species?		
Reviewers: Catch is not a feature of the Assessment. Aside from the Young's Bay mitigation fishery, catch in this region would be largely composed of fish from up-river, instead of local, stocks. Data on fish returns are more useful because they allow the identification of wild and hatchery fish to indicator rivers in the subbasin. The plan does not cover the Young's Bay mitigation fishery. Describing at least where both the recreational and commercial fisheries occur would strengthen this plan. The plan should try to ascertain the impacts on out-of-subbasin stocks through incidental catch. There should be a generic write-up of this for all of the subbasins.	No	3
	Summary comments and evaluation on the Species Characterization and Status Subsection: Does the assessment adequately describe the current status of fish and wildlife focal species?	
Reviewers: Overall, this subsection is adequate. Providing more information and discussion on human use trends and focal species would strengthen the plan. Given the length of the plan, the value of addressing the additional species of interest is questionable.	Yes	2

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?		
<p>Reviewers: This Assessment utilizes two levels of qualitative analysis. For the estuary and mainstem, a qualitative assessment is presented based on changes in habitat quality and quantity, and usage of these habitats based on expert opinion (table 2-11). For the western Oregon tributaries, a QHA analysis is conducted.</p> <p>The Assessment summarizes differences in quantities of historical and current habitat for several types of habitat. These include terrestrial habitat, but more emphasis is placed on aquatic habitat. A matrix associates species with habitat, by habitat type, species life stage, and intensity of use. This is done for both aquatic and terrestrial species. A juvenile salmonid "survival pathway" conceptual model is described. Extensive descriptions of juvenile salmonid habitat requirements are presented. Much briefer descriptions of habitat needs of other species are included.</p>		Yes	0
I.C.1.2	Does the assessment classify 6 th field HUCs within the subbasin according to the degree to which each area has been modified and the potential for restoration?		
<p>Reviewers: The estuary and western Oregon tributaries are described well, but the strata for the mainstem Columbia River (river mile 46 to Bonneville) are not (only two strata). That this area of the river is poorly described is identified as major information gap later in this report. This aspect of the plan remains to be undertaken, but the plan appears to indicate that the data necessary to do so is not available.</p>		Yes	1
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.		

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.

<p>Reviewers: Out-of-subbasin effects are difficult to summarize for many species, but the authors do note factors outside of these "basins" when applicable; for example, Pacific lamprey passage at Bonneville dam, or ocean production cycles for eulachon. There is no section devoted to this topic, and a notable issue of up-river hatchery production is seldom discussed. There is a good description of the climate's effect on ocean conditions and lower river conditions. Percy's work and David Jay's work is utilized, but the plume is seldom mentioned later in the plan. Food web changes are covered. A major point about how winter rains in the Cascades currently drive the variation in the hydrography is missed. (see ISAB 2000-5 Estuary Report: www.nwcouncil.org/library/isab/isab2000-5.pdf).</p>	<p>Partial</p>	<p>1</p>
<p>I.C.2.2</p>	<p>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?</p>	
<p>Reviewers: The Assessment does not adequately establish the necessary assumptions for each external effect.</p>	<p>No</p>	<p>2</p>
<p>I.C.3. Environment / Population Relationships</p>		
<p>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.</p>		
<p>Reviewers: The planners emphasize aquatic habitat and include discussions of contaminants on species' health and habitat conditions. They provide an effective description of the habitat types with maps. Doing a similarly thorough job for terrestrial habitat is needed to improve the plan. Also needed is resolution for the estuary/mainstem that is equal to that of the western Oregon tributaries.</p>	<p>Yes</p>	<p>2</p>
	<p>Summary comments and evaluation on the Environmental Conditions Section: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?</p>	
<p>Reviewers: The analysis of the environmental conditions of the estuary/mainstem subbasin is limited, but the text provides a very detailed discussion of habitats, changes over time, and links between species and habitats. The WOT analysis is more structured in that they apply the QHA model, but there are a number of editorial points needed for clarification of their presentation of these results. The emphasis on anadromous species leads the plan to overstress aquatic habitat.</p>	<p>Yes</p>	<p>2</p>
<p>I.D. Ecological Relationships</p> <p><i>Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?</i></p>		
	<p>(Y)es, (P)artial, (N)o</p>	<p><i>Need for additional treatment (0-4)</i></p>

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: Species inter-relationships are discussed in detail in a few locations through the plan, including extensive discussions on the impacts of invasive species on the estuary and associated habitats, predation and competition. The plan's emphasis is on salmonids. Severe channelization in the lower mainstem, the resulting subsequent loss of backwater habitat, and riparian degradation negatively affecting conditions for chum, coho, fall Chinook, and to some degree winter steelhead, are also examined. The association of focal species with anadromous populations is summarized in a table. A good synthesis table of focal habitats and the species use by life stage and frequency is provided. An examination on terrestrial focal species that is as detailed as that on aquatic species would strengthen this plan.

Yes

2

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 offers a very extensive discussion of ecological processes in the estuary for salmonid survival and growth. Habitat forming processes are presented in a conceptual "pathways" model of salmonid production in the estuary.

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.

<p>Reviewers: The Western Oregon Tributaries are assessed using QHA. The mainstem and estuary are assessed using the qualitative assessment (EMA). These are used to describe the limiting factors that historically and currently exist.</p> <p>This plan’s presentation of historic and current limiting factors differs from that of other subbasins. In this case, the authors conducted the Assessment and then prepared a series of working hypotheses that "collectively represented our current understanding of the primary issues in the estuary and mainstem" (this is also done for the WOT). These hypotheses complete the Assessment sections and then lead to tables of limiting factors that are included in the Management Plan chapter. The limiting factor statements also include the key finding that supports the statement of a limiting factor. The limiting factors are presented by species/life stage, and rated by the extent of impact and level of confidence or certainty in their assessment.</p> <p>Overall, this is done well for anadromous species, but not as well for terrestrial species. The limiting factors conclusions are interesting but some examples, such as N–type (Northern) coho, are suddenly used without any previous introduction.</p>	<p>Yes</p>	<p>2</p>
<p>I.E.2. Key Findings</p> <p>Is the knowledge gained through the assessment synthesized in regard to: 1) the status of species, 2) the status of the subbasin environment, 3) the biological performance of focal species in relationship to the environment, 4) the health of the overall ecosystem, 5) potential conflicts and compatibilities between individual species and ecological processes, 6) a determination of the key factors that impede this subbasin from reaching optimal ecological functioning and biological performance?</p>		
<p>Reviewers: The plan synthesizes limiting factors for anadromous fish. However, it is difficult to understand how the Assessment of the lower Columbia could omit issues associated with the altered seasonality of flows and its effect on the plume (essentially no consideration of the plume is in this plan), or the impact of the enormous hatchery production in the Columbia. Even if these issues are excluded as limiting factors, the text should acknowledge them and comment on why they are not included. It is difficult to understand how these issues could have been over-looked or excluded.</p>	<p>Yes</p>	<p>2</p>
<p>I.E.3. Subbasin-wide Key Assumptions/Uncertainties (“Working Hypothesis”)</p> <p>Does the assessment describe the key assumptions (including uncertainties) that have been made in the “Key Findings” above, and document the data sources and/or analytical tools relied upon?</p>		

<p>Reviewers: The planners present twelve working hypotheses for the estuary/mainstem that are tied to the limiting factors for rivers, streams and bays. Several of the hypotheses are similar and could be condensed. The hypotheses should also be reviewed to guarantee that they are testable. For the WOT, it is difficult to understand the origin of WH-2 (there is no reference to N-type coho in the entire plan) or why the last paragraph refers to chum salmon.</p>	<p>Yes</p>	<p>2</p>
<p>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).</p>		
<p>Reviewers: The plan’s emphasis on anadromous species has created an analysis that is good for them, but weak for other species. The assessment of the estuary/mainstem plus the WOT is large, and this amount of material is difficult to keep organized. The “analyses” that are conducted, however, are well presented and once the organization is discerned the logic process can be followed. Adding text describing the QHA analysis and condensing the hypotheses would augment the Assessment.</p>	<p>Yes</p>	<p>2</p>

<p>II. The Inventory <i>(This checklist section was developed from pages 11-12 of the Technical Guide.)</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).</p>		
<p>II.A. Existing Protection</p>		<p>(Y)es, (P)artial, (N)o</p> <p>Need for additional treatment (0-4)</p>
<p>II.A.1</p>	<p>Does the inventory identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?</p>	
<p>Reviewers: The Inventory provides a list of organizations, but gives no indication of their extent of protection.</p>		<p>No</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 Inventory does not assess the adequacy of existing protections.</p>		<p>No</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>	

Reviewers: The Inventory provides an extensive list of plans for all government levels, and the main responsibilities or characteristics of these programs with summary descriptions. The description of the Pacific Fishery Management Council should be updated.		Yes	0
II.B.2	Does the inventory assess the extent to which existing plans are consistent with the subbasin assessment and their adequacy in protecting and restoring fish, wildlife, and ecosystem resources? (It is possible that this analysis is done in another section of the plan, e.g. in the management plan.)		
Reviewers: This material is in Table 4-6 of the Management Plan; it is not in the Inventory. There is no attempt to synthesize or assess consistency.			2
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: A list and then brief text description of each project is provided in the Inventory.		Yes	1
II.C.2	For each management program (or project where not clearly part of an overarching management program), does the inventory describe the program, project or activity; identify the management or lead entity; identify how the program/project was authorized and who is responsible for implementation; identify the funding source; and identify the relationship to other activities in the subbasin?		
Reviewers: The plan provides this information, but combining the presentations in the Inventory and in Table 4.6 of the Management Plan would be helpful.		Yes	1
II.C.3	For each management program (or project where not clearly part of an overarching management program), does the inventory identify limiting factors or ecological processes the activity is designed to address?		
Reviewers: The description of the limiting factors that existing plans are meant to address is in the Management Plan.		Yes	1
II.C.4	For each management program (or project where not clearly part of an overarching management program), does the inventory summarize accomplishments/failures of activity		
Reviewers: A summary of accomplishments and failures is done for some management programs, but there is no way to know if this is done comprehensively with the information provided.		Partial	2
II.C.5	Does the inventory relate the assessment to the existing activities and identify the gaps between actions that have already been taken or are underway and additional actions that are needed to address the limiting factors and meet recovery and other goals, and identify inadequacies in both design and implementation?		
Reviewers: The subbasin plan makes a good start at relating its Assessment to existing activities, identifying 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		Partial	2

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?

<p>goals, and identify inadequacies in both design and implementation. This is done in the Management Plan. Each table describing an action to be taken includes a row for 'Program Gap Analysis'. In the introduction to the Inventory chapter, however, the authors note that a database of projects and programs has been compiled and could be queried for additional information to enable a more empirical appraisal of projects and assessment outcomes. Without such a link, how completely these projects are addressing uncertainties identified in the plan is unknown.</p>		
	<p>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).</p>	
<p>Reviewers: The Inventory section does not include the information requested; it is largely in the Management Plan. The Inventory needs to be reorganized to compare current programs and projects with the limiting factors identified in the Assessment. A concise comprehensive Inventory would be useful for generating project solicitations, and for developing and reviewing proposals. In addition, further effort on the Inventory could lead to a better understanding of the system, as it did in the Willamette Subbasin Plan. The scores for this section (above) acknowledge that much of the necessary information is in the Management Plan. But the overall evaluation of this Inventory reflects that the present Inventory is a long list of agencies, programs and projects without adequate synthesis, interpretation, or evaluation. However, much the necessary information has apparently been collated.</p>	<p>Partial</p>	<p>3</p>

<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><i>Need for additional treatment (0-4)</i></p>

Reviewers: The plan’s vision statement is adequate. Discussions that took place during the development of the vision are listed as supporting statements that articulate the challenges facing the subbasin and the desired outcomes of management actions. These pertain to cultural and economic sustainability, biological integrity, pollutants and contaminants, etc. A number of goal statements for focal species are also specified.	Yes	0
III.B. Biological Objectives		
Does the Biological Objectives Section of the Management Plan describe physical and biological changes within the subbasin needed to achieve the vision?		
Reviewers: The link between the biological objectives and the vision is not clear. The biological objectives are cut from a TRT document. The objectives are often strategies. The habitat objectives are often general, but these objectives are linked to anadromous fish life stages. The biological objectives in Table 4-5 are difficult to interpret due to a lack of explanation of the terms that used (e.g., what mortality rate is being referred to?). No objectives for WOT are included. The plan does not make clear the source of the values used in this table of biological objectives, or who has actually agreed to the values presented for Pacific lamprey and the other species of ecological interest. In the physical objectives portion of the plan, there are several objectives that appear to be more biological than physical (please see PO6, PO7, PO8, PO11, PO12, PO16, PO18). Also PO34 appears to be the same as PO16. Clearing up this confusion would augment this plan.	Partial	2
III.B.1. Are the biological objectives consistent with basin-level visions, objectives, and strategies adopted in the program? (Council Question 4) The 2000 Fish and Wildlife Program, pages 16-18, provides general descriptions for basin-level goals, objectives, and strategies. The Mainstem Amendments provide additional biological objectives as well on pages 11-14. ⁷		
Reviewers: Given the limitations of the biological objectives noted in III.B.1, is hard to determine if this plan is consistent with basin-level visions etc. The plan’s biological objectives are expressed in terms of abundance, productivity, and harvest levels, which are clearly aspects of the program. However, this question may be overly restricted to biological objectives for these subbasins. The major ecological and production benefits to the program are more likely to be the physical habitat and/or environmental conditions (e.g., flows) that would be of value to most up-river populations, plus resident aquatic and terrestrial species. The physical objectives are more fully developed on pages 4-35 through 4-43 and are more aligned with objectives of the Fish and Wildlife Plan. More information on terrestrial species and habitat would augment this portion of the plan. The rating for this question assumes that the plan’s physical objectives should be included in this response. Ratings would be weaker based on the biological objectives only.	Yes	2

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

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: Limiting factors are ranked as high, medium or low. The criteria for the rankings are not clear. Levels of uncertainty are also ranked. Limiting factors are then summarized according to these rankings and as they affect groups of focal species, species of interest, and others.	Yes	
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: Strictly referring to biological objectives (Table 4-5), the authors have tried to make the objectives measurable, but the rationale for the values used in Table 4.5 is unclear. This information is likely embedded in the Management Plan supplement.	Yes	3
III.B.4. Are biological objectives identified for both the short and long-term?		
Reviewers: The plan does not identify short and longer-term biological objectives, but the measures that could be implemented to achieve the plans objectives are identified as being short term (less than 25 years) or long term.	Partial	2
III.B.5. Are the biological objectives complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin?		
Reviewers: In tables 4.5 and 4.6 the plan contains the information necessary to link biological objectives through strategies to measures that could be taken to make the plan complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin. Utilizing this information to make the link would strengthen this plan. As a general comment, non-native species of recreational interest -- such as walleye, bass, and shad -- are not adequately considered, and the management of those species may not complement this plan's objectives. The current understanding of potential problems and consequent needed management actions are not described.	Partial	2
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: This plan adequately describes the CWA.	Yes	0

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).

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		
Reviewers: The plan adequately recognizes ESA-based efforts.	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.)		
Reviewers: This plan does not identify disagreements. If none exist the plan should state so.	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 plan relates each strategy to one or more objectives and describes how it would be implemented by one or more measures (or actions). The strategies’ association with the vision has to be inferred, but the strategies are related to the subbasin assessment via the objectives and limiting factor analyses.	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: This plan is consistent with the Fish and Wildlife Program.	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		

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.

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

Reviewers: This plan prioritizes strategies on four issues: ability to address key objectives, their relation to the ESA, their relation to focal species, and their relation to the socio-economic considerations in the vision statement. The prioritization process for strategies is explained; however, even with prioritization the list of strategies is still very long. Further explicit prioritization would augment the plan.	Partial	2
III.C.4. Prioritization. Does the Strategies Section describe a proposed sequence and prioritization of strategies?		
Reviewers: Prioritization is conducted to a limited extent, eight proposed strategies are assessed to be consistent with the four issues (above) and identified as Tier 1 strategies. Strategies are "tiered" according to their ability to address key objectives. In the end this section defaults to ongoing projects and further studies. "No net loss" is not a strategy. The measures discussed should get to a more useful level. The plan does this to a certain extent at a general level, but it does not give a clear indication of what the few highest priority actions needed are.	Yes	2
III.C.5. Additional Assessment Needs. Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		
Reviewers: One important strategy identified in the plan is to complete a more quantitative assessment of the estuary and the mainstem, particularly the latter, to more accurately assess restoration and protection priorities. The ISAB and ISRP have made strong statements in past program reviews emphasizing the need to pay more attention to the Lower Columbia Mainstem.	Yes	2
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: Existing programs and their consistency with the subbasin plan's strategies are described and include the CWA. A separate section describes consistency with CWA and ESA in detail.	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: Existing programs and their consistency with the subbasin plan's strategies are described and include the CWA. A separate section describes consistency with the CWA and ESA in detail.	Yes	0

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

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.

<p>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). <i>NOTE: The focus of the RME component should be on the strategy level rather than individual project level.</i></p> <p>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.</p>			
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>	<p>(Y)es, (P)artial, (N)o</p>	<p><i>Need for additional treatment (0-4)</i></p>
<p>Reviewers: Research needs to be reviewed in Chapter 4.8 of this report and Chapter 8, Volume 1 of the LCFRB report. This subbasin plan does not yet have an RME section.</p> <p>RM&E efforts developed specifically to implement this subbasin plan are included as part of the LCFRB Lower Columbia Salmon and Steelhead Recovery and Subbasin Plan Chapter 8, Monitoring and Research, May 2004. This plan states that it is expected that this along with the substantial ongoing RME planning efforts can be used to assist in evaluating this plan's strategies and measures.</p> <p>The ISRP has reviewed these other RME plans and has identified a number of concerns. In addition, it is not certain how subbasin RME might be integrated with Regional RME initiatives. This activity is critical to learning how to manage these subbasins and merits more complete attention in this plan.</p>			
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>		
<p>Reviewers: The plan’s monitoring objectives can be found in Chapter 8, Volume One of the LCFRB report.</p>			
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>		
<p>Reviewers: The plan’s monitoring indicators can be found in Chapter 8, Volume One of the LCFRB report.</p>			

III.D.4	Data and Information Archive: Does the RME subsection describe an infrastructure to archive relevant data and meta data generated through monitoring efforts in existence for the subbasin (e.g., locally or at a regional Fish and Wildlife Program funded database such as StreamNet, the Fish Passage Center, or DART)? Specifically, does the RME subsection include discussion of quality assurance/quality control (QA/QC), data management and analysis, and data reporting?		
Reviewers: The plan includes little text on a data and information archive; the reader is referred to Chapter 8, Volume One of the LCFRB report to find information on the data and information archive.			
III.D.5	Coordination and Implementation: Does the RME subsection describe who will collect the information and data collection methods whether collection is done by a subbasin, provincial, state, or a regional entity, or a combination of entities? This should include a description of coordination with regional RME efforts in the basin (Regional Partnership, Action Agencies Research, Monitoring, and Evaluation Plan, etc) with standardization of data methods. It should also include estimates of how much the proposed M and E will cost.		
Reviewers: The plan includes little text on the data and information archive's coordination and implementation gambit; the reader is referred to Chapter 8, Volume One of the LCFRB report to find information on data and information archive's coordination and implementation scheme.			
III.D.6	Summary Question. RME Logic Path (Evaluation and Adaptive Management): Does the subbasin plan provide a scientifically supportable procedure for refining the biological objectives as new information becomes available about how fish, wildlife, and the environment interact, and in relationship to how the plans are implemented over time? (Council Question 7) Specifically, does the RME subsection describe a scientifically sound logic path for how to test if the subbasin plan's strategies are helping to reach the stated vision and objectives? I.e., Is the RME agenda adequately framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties?		
Reviewers: The plan's RME logic path and its adaptive management component are found in Chapter Eight Volume One of the LCFRB report. Without an RME section in the plan, this can only be evaluated as partial, at best.			
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>Reviewers: The overall presentation of this plan is sound, but the logic path is difficult to follow and the biological objectives should be clarified. The Management Plan includes the best content of the subbasin plan's three components. Much of the needed information is contained in the plan, but the overall presentation should be re-organized for readability and clarity. The sheer size of this document limits its usefulness. Key information from the appendices and supplemental documents should be pulled into the three major components of the plan; from there, other secondary supporting and background information can be referenced in appendices.</p> <p>Additional focus on the mainstem, Portland, Vancouver, Astoria, etc. would augment this plan. The needs of the non-anadromous species would benefit from more attention, as the present plan fails to address management of anything but anadromous stocks. There also remains a significant role for research in these subbasins and a continued need for a full habitat inventory and assessment in the fluvial mainstem. The implementation of a comprehensive RME program could be very expensive. The difficulty in understanding the RME section is a major limitation to this plan. Learning in the estuary, plume, and mainstem may be critical to recovery and management of many species. The lack of directed studies in the mainstem and an agreed monitoring and evaluation program appear to continue to be major issues for the Columbia Basin.</p>	<p>Partial</p>	<p>3</p>
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General Council Question. Consistency with the Fish and Wildlife Program and its Scientific Foundation

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

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

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

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

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

<p>Reviewers: A significant portion of the text in this plan is consistent with the Council’s eight principles. The plan is generally consistent in theory, but in implementation it could differ. The strategy statements leave some uncertainty about what will actually proceed, but the measures and research identified could form the elements of a progressive plan that could assist recovery and restoration.</p> <p>This plan needs to be better organized, according to the Council’s format from the technical guide, and broadened to be an ecosystem-based subbasin plan that addresses the subbasins beyond their anadromous issues.</p>	<p>Partial</p>	<p>2</p>
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Editorial and Other Specific Reviewer Comments

Additional detailed comments on the Bi-state Plan: Estuary, Lower Columbia River, and western Oregon tributaries.

Table 2-1, page 2-10: this is a good example of a table that should be included in a reference appendix.

Table 2-3, page 2-32: this is a good summary of the differences in habitat classification systems, but it was clear after this careful discussion of the differences, what is recommended for use in this plan?

Section 2.1.1.6, pages 2-33: The estuary is well described in seven geographic/habitat areas (without including the plume) but the mainstem is relegated to two areas over the entire length. An explanation for the reason for this and what the data limitations are would clarify the reason.

Sections 2.1.1.7 Major Land Use and Section 2.1.1.8 Areas of Biological Significance ... are not adequately developed and could be important components of this plan. Land use description is very generic without any quantification, and the latter section is just a list of sites without any indication of area, value, or security of its protection.

Section 2.1.2 Focal Species: Table 2-4 is a good clear presentation of the species selection criteria but the selection becomes very salmon-centric and is light on the terrestrial species (that was the choice of the planners). However, you might consider the use of some resident freshwater species (Dolly Varden, Cutthroats) that would be better indicators of local habitats, and re-consider the value of lamprey. If Pacific lamprey does not feed during migration and metamorphosis through the lower river and estuary, why are they an important species for these subbasins? What would monitoring them demonstrate? There is also a question about the value of the Species of Ecological Significance, Management Interests, and Recreational Significance. There a large number of species in these categories and it is not evident what this adds to the overall plan. The justification is not well developed (especially when three of the recreational species are exotics).

Note that neither the Focal Species description nor Appendix A actually describes all of the focal species or the other categories. The extensive information in the focal species descriptions is likely best placed in an appendix.

Figure 2-12, page 2-69: very good model of habitat process.

Section 2.1.3.1.1 Hydrological Conditions, this is a very informative section, but the authors may want to examine a similar presentation and graphics in the Council report ISAB 2000-5 (figures 5 & 6 demonstrate the influence of west slope streams and streams below Bonneville on past and current seasonal flows).

Section 2.1.4.1, page 2-108: 1st paragraph includes two references to a section 0. What does this refer to?

Table 2-11, page 2-110: provides a useful summary of species, life stages, and habitat types but the table is heavily footnoted with qualifying comments about table entries. It may be worthwhile incorporating another column that could assess confidence in the assessments in the table.

Section 2.1.7, page 2-153: In the absence of a quantitative tool for the estuary and fluvial mainstem, working hypotheses were developed:

“... in this assessment, hypotheses were developed based on scientific evidence and professional judgment. The hypothesis statements collectively represent our current understanding of the primary issues in the estuary and lower mainstem. Because the hypotheses are supposed to serve as the foundation of the management plan and directly link to biological objectives, in some cases the hypothesis statements needed to make a quantum leap to bridge the gap between our current level of understanding and the desired conditions in the subbasins.”

This is a reasonable means to proceed and the authors identify 12 hypotheses for the estuary/mainstem but some were very similar in content or issue. Reviewers suggest a careful review of the hypothesis *to ensure a minimum of truly independent hypotheses that are testable*. For example, H7 and H11 are more statements of beliefs but could be re-phrased as testable hypotheses. For the WOT, it is difficult to understand where WH-2 developed from (there is no reference to n-type coho in the entire Plan or appendices) or why the last paragraph of this hypothesis refers to chum salmon.

Section 2.2.4.3 TRT and Status assessments for WOT populations

A large section of the WOT assessment is taken directly from TRT efforts. If this is the best current assessment then the use is appropriate, but it does generate a question concerning subbasin planning. Are the TRT analyses conducted at an appropriate scale for subbasin planning, were they conducted in consultation with local experts, and do they identify the key or core populations and habitats to protect or restore? The goal of this subbasin planning was identify these opportunities through local knowledge ... a comment about the support for TRT process and analyses could be reassuring for Columbia Basin planners.

Section 2.2.5.2, page 2-268, Reach Rankings: This section and table gets to the essence of the information desired from these planning processes. The material leading up to this section was very detailed and well laid out (but difficult to read due to print sizes). However, there is no description of the methods used in reaching agreement on these rankings. What is the basis of the “Priority value” presented and how was it estimated? This value seems to be critical to the listings but is not described. It is not clear how you decided to stop listing more reaches? Are the priority ratings done within streams or are they actually determined throughout the WOT?

Table 2-36 needs a more informative caption to describe the column headings and what the use of the brackets is in the Life Stage column.

Section 2.2.5.3 Limiting Factors and Working Hypotheses for WOT

These 8 working hypotheses are not stated as typical hypotheses but they do identify the actions needed based on the WOT assessments. The statement for WH-2 though does not seem to be based on any previous discussion in the plan. What is the basis for n-type coho and why are they important in the WOT?

Table 2-38, page 2-281: should this table include E.H12 also?

Chapter 3 Inventory

This is 147 pages of difficult reading and no effort is made to relate it to the assessments, or to synthesis the material presented, or to consider what these programs etc. mean to the level of protection in these subbasins. This style of presentation is of very little value but clearly was a lot of work. The work on the inventory is clearly incomplete but the background material will hopefully enable completion of the requested tasks. At present, no scientific review is possible given this style of presentation and absences of analysis.

Chapter 4 Management Plan

Page 4-33 introduction to Biological objectives: Why would steelhead not be included in this introductory paragraph?

Table 4-5, page 4-34: The authors attempt to use a table to summarize the biological objectives. Unfortunately, the biological objectives in Table 4-5 are difficult to interpret due to a lack of explanation of terms and values used (e.g., what mortality rate is being referred to?). Also why are there no objectives for WOT? What is the source of the values used in this table of biological objectives, and who has actually agreed to the values presented for Pacific lamprey or the species of ecological interest? In Table 4-5 there appears to be footnoting used but there are no footnotes. In the physical objectives, there are several that definitely seem to be more biological than physical (see PO6, PO7, PO8, PO11, PO12, PO16, PO18) and isn't PO34 the same as PO16?

Section 4.4 Strategies

A total of 23 strategies are identified and eight listed as primary or Tier 1 strategies (is S23 actually in the top tier because it is list on pages 4-44 and 4-45?). However the top 8 strategies are really very general and may have been written before all this work. They really condense to:

- Protect what we have (where feasible) and restore impaired to “properly functioning conditions...” but how much, where, and when?
- Avoid obvious large scale impacts but mitigate small impacts (“no net loss”, but this strategy has failed in many other locations)
- Use existing processes and programs (this could be OK, but recall that these processes were not well presented in the Inventory)
- Fish but avoid depressed stocks (commonly stated now, and fisheries in the estuary have been responsible in measuring this)
- Study stuff (OK, but what and by whom, is there money?).

The strategies that need to be identified should be more action oriented so that progress can be made in understanding and recovery. The strategies are “saved” by a much better section of Measures.

The levels of detail in limiting factors, objectives, strategies, and measures for two large subbasins becomes almost too much to review in the time provided. There is clearly a need for the authors to seriously consider how to condense this material to a more understandable content and reduce the number of options (strategies and measures) to those that are most likely to be acceptable to local communities and to most benefit the focal species. Given this level of detail and number of issues, a serious effort a prioritization of the actions seems essential. The RME section was disappointing given past efforts in these subbasins to develop a similar plan.

A very informative and good effort overall, but there is a need to determine what all this directs the Council to do! Think less detail and more focused advice.