

# Lower Mid-Columbia Mainstem

## Review Summary

The Lower Mid-Columbia Mainstem Subbasin Plan meets many of the scientific elements of a subbasin plan described in the Council's 2000 Fish and Wildlife Program and Subbasin Planning Technical Guide, but the plan does not adequately identify limiting factors for the aquatic focal species to constitute an ecosystem approach, with the exception of white sturgeon. Furthermore, the plan focuses almost wholly on the Rock Creek watershed and fails to cover the other major watersheds in the subbasin (Pine and Glade Creeks) as well as the mainstem portion including the Hanford Reach. The Inventory and Research Monitoring and Evaluation (RME) sections of the plan are also incomplete.

## Assessment

The Lower Mid-Columbia Mainstem Subbasin Overview's general description of the subbasin is adequate, but the description of the subbasin in a regional context is incomplete. The introduction indicates that Rock Creek and Pine Creek watersheds will be concentrated on in the plan, but in the overview and throughout the remainder of the plan Rock Creek almost exclusively dominates the plan. In future drafts the Pine Creek and Glade Creek watersheds plus the mainstem portion of the subbasin should be more fully described, assessed, and included in the Management Plan.

The fish focal species assessment section does an adequate job in describing the past and current status of the focal species, especially for the white sturgeon, considering the limited information available. The plan includes an excellent brief summary of the current status of redds, the management attempts to protect redds, and the management plans aimed at reducing the stranding of juvenile fall chinook in the Hanford Reach. The juvenile fall chinook the rear in the mainstem habitats of the John Day reservoir are not described.

The wildlife focal species assessment section is very strong and provides good descriptions of wildlife focal species, including their distribution, relation to focal habitat, relation to other species, habitat needs at different life stages, and major disturbances. This section also includes good maps showing potential habitat.

The overall Assessment is well developed and provides a good foundation for development of an effective Management Plan. However, more information is needed on the physical environment of the remainder of the subbasin (other than Rock Creek) and the mainstem. Also out-of-basin effects for migratory birds need to be described. Given the lack of information, uncertainties should be identified as research needs in the RME plan.

## Inventory

The Inventory section of the plan is incomplete. Existing protections are not listed. Existing plans and management programs are provided in a table as "projects," but the information about the projects is very general and does not identify the gaps that should be covered in a comprehensive Management Plan.

## **Management Plan**

For the Rock Creek portion of the subbasin, the Management Plan presents a reasonable synthesis of objectives, limiting factors, and strategies designed to address the limiting factors. The wildlife section of the plan is better developed than the fish section. Objectives could be specified in a more measurable form. The plan does not have a lot of detail about its implementation processes. It would have been good to see more of the "how to effectively deal with anthropogenic factors" section addressed.

A Management Plan has not been adequately developed for the mainstem portion of this subbasin, including the Hanford Reach, home to the most significant fall chinook population in the basin. Although the Assessment includes an excellent, brief summary of the problems encountered by fall chinook in the Hanford Reach and the management strategies that have been undertaken to date to minimize the effects of fluctuations of flow on killing of juveniles by stranding, The Lower Middle Columbia Mainstem subbasin plan offers a disclaimer that it does not include a set of proposed new management strategies for the Hanford Reach. Reviewers have recommendations below on the need for modification of the existing strategy in the Hanford Reach and for an additional RME element in the portion of the subbasin below the Reach. Strategies to be used for fish protection at three of the four PUD projects (Wells, Rocky Reach and Rock Island dams) in the Upper Middle Columbia Mainstem Reach are somewhat open-ended in that survival standards have been agreed upon, leaving it up to the project operators to develop strategies that will accomplish those survival standards.<sup>1</sup> The HCPs and standards are referred to in the plan, along with descriptions of some strategies being undertaken.

Current measures for protection of fall chinook in the Hanford Reach depend upon agreements dating back to 1980 in the settlement of a lawsuit before FERC among Grant County PUD, the fishery agencies and tribes for provision of stabilized flows out of Priest Rapids Dam. At that time, the FERC process undoubtedly was the appropriate (and perhaps only) venue through which to accomplish this protection. However, implementation of stable flows out of Priest Rapids Dam depends upon the provision of stable flows out of upriver projects operated by the Corps of Engineers, because of the lack of water storage capacity in the mid-Columbia Reach. Therefore, in order to be able to live up to their agreements, Grant County PUD has had to develop, as a second step, hourly coordination agreements with the Corps for upriver releases. Recent progress reports from Grant PUD demonstrate a frequent failure on the part of the Corps to live up to the requirements for a schedule of upstream water releases that would satisfy the agreed upon stability below Priest Rapids Dam.<sup>2</sup>

The Lower Middle Columbia Mainstem Subbasin plan fails to discuss the Council's 2004 Mainstem Amendment that calls for changes in upstream reservoir operations. The BiOp requirements affecting those reservoir operations are for the purpose of providing flows to increase the survival of juvenile salmonids in that lower reach of the mainstem below the Hanford Reach. The Council justified this change in the BiOp requirements by calling for a study

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<sup>1</sup> These standards appear in Habitat Conservation Plans (HCPs) that have been formally adopted by the Federal Energy Regulatory Commission (FERC) as part of the operating licenses of the projects.

<sup>2</sup> If I control the spigot at the house, my wife may not be able to water her garden by opening the nozzle at the other end of the hose.

of the effects of the change. Council asked the ISRP to review a proposal from Montana Department of Fish and Wildlife for a study of the effects in Hungry Horse Reservoir. The proposal was recommended by the ISRP for funding, but the ISRP pointed out that a missing element from the study is an evaluation of the effects of the changes on survival of juvenile salmonids during passage through the lower mainstem. The Lower Middle Columbia River Mainstem is the reach wherein such effects are thought to occur. No study or proposal has been submitted that would measure the effects of this change on survival of juvenile salmonids in the lower mainstem.

### Recommendations

1. It is now time for the Council to direct its strategy in the Hanford Reach to the Corps of Engineers rather than to Grant PUD. The Corps should be the lead entity in providing stable flows through the Hanford Reach. The mid-Columbia PUDS, including Grant County PUD should be cosigners, rather than originators of the agreement. The Council, in its Mainstem Amendments has already called for the Corps of Engineers to provide an annual report to the Council on results of the so-called “reimbursable program,” which is reviewed by the ISRP. The mechanism for Council to assert authority is there.
2. A management plan specific to the Snake River Mainstem needs to be developed in order to provide a foundation of scientific soundness to the subbasin plans that deal with fish and wildlife in the tributaries that empty into the Snake River below the Hells Canyon complex. It should encompass the mainstem portions of the two subbasins, the Snake River Mainstem Hells Canyon and the Lower Snake River Mainstems.
3. Currently, the lowermost boundary of the Upper Middle Columbia Mainstem subbasin is located just below Wanapum Dam. The boundary should be redrawn to include Priest Rapids Dam and the Hanford Reach, so as to incorporate in one subbasin the strategies for protection and enhancement of fall chinook there. That stock of fish is arguably the healthiest stock of anadromous fish remaining in the Columbia Basin. Its continuing good health can only be ascribed to management strategies that have been undertaken to protect redds during and after spawning, during incubation of the eggs, as well as emergence and migration of juveniles. Hatcheries have contributed, but to a lesser degree than natural production in the river.

### **Research, Monitoring and Evaluation**

The wildlife RME section is more directed at a suite of projects than as part of the overall logic path, although the projects are tied to the strategies. For the fish species the RME section is primarily a general guide taken from the Washington State Salmon Recovery Funding Board documents and is not specifically focused on this subbasin.

## **Review Checklist**

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

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

<b>I. A. Subbasin Overview</b>			
<p><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>			
<b>I. A.1. General Description</b>		(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
I.A.1.1	Does the assessment provide a general orientation to the subbasin (location, size, distinguishing natural and cultural features, land use, land ownership) and an overview of jurisdictional authorities (state, county, federal lands, tribal lands and fishing rights)?		
Reviewers: The geographic orientation of the subbasin is adequately described. Land ownership is described for only a portion of the subbasin. The description of land use is extremely brief. Jurisdictional authorities are not described. The plan did not cover the Hanford Reach because of the Hanford Monument Planning effort?		Partial	1
I.A.1.2	Does the assessment provide a general description of the subbasin's macro-environment (geology, climate and weather, land cover, vegetation) and of the subbasin's water resources (hydrography and watersheds, hydrologic regimes, water quality, riparian and wetland resources), water uses, and modifications to water resources (hydropower projects and operations, water diversions, channel modifications)?		
Reviewers: The description of the physical environment of the subbasin is extremely brief. Water quality and hydrology are described in more detail. Descriptions of resources are general and in moderate detail. The Assessment needs information on the flows and changes in flow patterns in the mainstem.		Partial	1
I.A.1.3	Does the assessment provide a general description of anthropogenic disturbances to the aquatic and terrestrial environment, organized by the source of disturbance (urbanization, agriculture, forest practices, water development, mining, transportation, and other)?		
Reviewers: The description of anthropogenic disturbances is cursory in this section, but discussed in more detail in the focal species section. It is included in a relevant way in the focal habitat discussions.		Partial	2
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 non-native fish are not adequately listed and information on the species in listed ESUs that migrate through the subbasin is needed. A full list of wildlife species is provided in an appendix. Forty-five of the 435 wildlife species are either federal or state listed as of concern, threatened or endangered.		Partial	2
I.A.1.5	Does the assessment identify plants that have been designated as threatened or endangered under the Federal Endangered Species Act or state equivalents, and/or that are recognized by Native American tribes as having special cultural or spiritual significance, or (optional) that have special ecological importance within the subbasin?		
Reviewers: Appendix D lists rare plants included in the WA Natural Heritage Program. Plants of cultural importance to the Yakima Nation are also included - they are listed in an appendix and also were considered as one of the criteria for selecting focal habitat. Also, vegetation is explicitly discussed in the focal habitat sections.		Yes	0
<b>I.A.2. Subbasin in the Regional Context</b>		<i>(Y)es, (P)artial, (N)o</i>	<i>Need for additional treatment (0-4)</i>
I.A.2.1	Does the assessment describe how this subbasin fits within its regional context (size in relation to the total Columbia Basin, placement within the ecological province and relationship to other subbasins in this province, qualities that distinguish this subbasin from others in the province)?		
Reviewers: The subbasin's placement within the Columbia Rive basin is indicated on a map. A brief description of the subbasin within the Columbia Gorge Province is presented.		Yes	2
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. <sup>3</sup> ) where this information was available during the planning process?		
Reviewers: There is only a brief statement regarding the Mid-Columbia steelhead ESU. The Assessment should also describe the listed species that migrate through the subbasin.		Partial	1
I.A.2.3	Does the assessment summarize external environmental conditions that might have an effect on fish and/or wildlife in this subbasin (the ocean, the estuary, the mainstem downstream from the subbasin, and, as relevant, upstream areas and adjacent subbasins)?		
Reviewers: External environmental conditions that might have an effect on fish and/or wildlife in the subbasin do not appear to be covered, except through the brief descriptions of the Columbia Gorge Province.		Partial	3
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)?		

<sup>3</sup> The USFWS bull trout planning hierarchy includes, from large areas to small, distinct population segments, recovery units, recovery sub-units, core populations, core areas, and local populations. A subbasin would typically correspond to a recovery unit or sub-unit.)

Reviewers: There is some brief mention of historical human settlement patterns, but no forward projections.	Partial	3
<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 Lower Mid-Columbia Mainstem Subbasin Overview is adequate for the general description of the subbasin, but the description of the subbasin in a regional context is incomplete. The introduction indicates that Rock Creek and Pine Creek watersheds will be concentrated on in the plan, but in the overview and throughout the remainder of the plan Rock Creek almost exclusively dominates the plan. In future drafts the Pine Creek and Glade Creek watersheds plus the mainstem portion of the subbasin should be more fully described, assessed, and included in the Management Plan.	Yes	2

<b>I.B. Species Characterization and Status</b>		
<i>General question: Does the assessment adequately describe the current status of fish and wildlife focal species?</i>		
Note to reviewers: for this section of the review, the checklist should be applied to each focal species. Please identify which species your evaluation applies to in the comment field. Use the ranking fields (Y,P,N; 0-4) to give an overall evaluation across all focal species. Note differences among approaches to species in the comment field. If necessary, once the plans are received, assignments will be made to cover an individual species or a series of focal species.	(Y)es, (P)artial, (N)o	Need for additional treatment (0-4)
I.B.1. Does the assessment identify a series of focal species that will be used to characterize the status of fish and wildlife species within the subbasin? These should include one or more wildlife, resident fish, and, where present, anadromous fish species. Anadromous fish may also be included in subbasins where they were historically present and where there is a reasonable probability that these fish could be restored to sustainable levels. Criteria suggested for selecting focal species include a) designation as Federal endangered or threatened species, b) local ecological significance, <sup>4</sup> and c) cultural significance.		
Reviewers: The plan lists eight wildlife focal species: Western gray squirrel, mule/black-tailed deer, grasshopper sparrow, Brewer's sparrow, white-headed woodpecker, Lewis' woodpecker, American beaver, yellow warbler.  IBIS identifies habitat types. Three are chosen as focal: Interior Riparian Wetlands, Shrub Steppe/Interior Grasslands and Ponderosa Pine/Oregon White Oak. Criteria and rationale are provided for their selection. A good summary of changes in the quantity and quality of these habitats is provided in tables. Good summary tables linking habitats to focal species and the flow diagram of the focal habitat and species selection process is useful.	Partial	1

<sup>4</sup> Species that could be considered under the ecological significance criterion might include those that: a) are particularly rare within the subbasin (regardless of ESA classification), or b) perform a particularly important or unique ecological function.

<p>The plan lists four fish focal species: white sturgeon, steelhead, fall chinook, and coho. Lamprey is a species of interest.</p> <p>There is a need to mention the listed species that use the reservoir for rearing or migration.</p>		
<p>I.B.2. Does the assessment identify and characterize focal species populations; i.e. delineate unique population units and, as applicable and where information is available, meta-populations, subpopulations and/or other genetic/behavioral groupings used by scientists or managers?</p>		
<p>Reviewers: The fish assessment section is particularly well done, especially for white sturgeon.</p> <p>The Assessment appears to identify and characterize wildlife focal species populations to the extent that information is available, although this is not always explicitly mentioned.</p>	<p>Yes</p>	<p>0</p>
<p>I.B.3. Does the assessment describe the current and historic status of each focal species population and summarize available population data (abundance, productivity, spatial structure, etc., with particular emphasis on trend data)?</p>		
<p>Reviewers: A good discussion of focal habitats and the changes over time under various influences is provided. The text includes a discussion of the rationale for selection, historic conditions, current conditions, and stresses.</p> <p>There is an excellent table summary of human disturbance and effect on ecosystem component by focal habitat type.</p> <p>A good description of population status and trends is provided for wildlife species. Literature is cited and the discussion appears to summarize available information well. There is a good discussion of the effects of various stresses on focal habitats and their wildlife.</p> <p>For migratory birds, more information on out-of-basin effects (e.g. what is happening to their habitat in their wintering areas, how out-of-basin effects are likely to affect them in the subbasin, etc.) would be useful context.</p>	<p>Yes</p>	<p>2</p>
<p>I.B.4. Does the assessment describe the population's life history, including identifying distinct life stages?</p>		
<p>Reviewers: The Assessment provides good descriptions of wildlife focal species, including distribution, relation to focal habitat, relation to other species, habitat needs at different life stages, and major disturbances.</p> <p>There are good maps showing potential habitat.</p> <p>The information for focal fish species appears to be generic life histories of the Rock Creek populations, which indicates that these populations have probably not been studied in detail.</p>	<p>Yes</p>	<p>2</p>
<p>I.B.5. Does the assessment characterize the genetic diversity of the population, especially regarding possible effects of artificial production? Specifically does the assessment describe the historic and current status of introductions, artificial production, or captive breeding programs in this subbasin or affecting the subbasin through straying or other means, and describe the relationship between the artificial and naturally produced populations?</p>		

<p>Reviewers: Genetic information is provided for white sturgeon, but not for other focal fish species.</p> <p>Genetic information is not presented for wildlife species. The implication of the wildlife discussion is that this information is lacking.</p>	Partial	2
<p>I.B.6. Does the assessment describe historic and current harvest, including both in-subbasin harvest and downstream or ocean harvest affecting the focal species?</p>		
<p>Reviewers: The plan has no harvest data for deer or beaver, just brief qualitative descriptions. Given the early importance of beaver trapping and trade in this region it would be useful to include information about the magnitude of the harvest, the likely interactions of beaver with other species when their populations were larger, and implications for restoring beaver to these levels.</p> <p>Harvest for white sturgeon is plotted for two reservoirs. It would be good to provide more detail tying this harvest in with population dynamics in these reservoirs. More information on their current population status (beyond "could support sustainable harvests" - at what level?), and more detail (beyond "devastating effect") on historical population effects would be beneficial.</p> <p>No harvest data are presented for steelhead, coho, or chinook.</p>	Partial	3
<p><b>Summary comments and evaluation on the Species Characterization and Status Subsection:</b> Does the assessment adequately describe the current status of fish and wildlife focal species?</p>		
<p>Reviewers: The fish and wildlife assessment sections do an adequate job in describing the past and current status of the focal species considering the limited available information. The juvenile fall chinook rearing in the mainstem habitats of the John Day reservoir are not described.</p>	Yes	2

<p><b>I.C. Environmental Conditions</b> <i>General question to be addressed: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?</i></p>		
<p><b>I.C.1. Environmental Conditions within the Subbasin</b></p>		<p>(Y)es, (P)artial, (N)o</p> <p><i>Need for additional treatment (0-4)</i></p>
I.C.1.1	<p>Does the assessment describe the current condition of the environment in this subbasin, and characterize the condition of the environment under the following reference conditions: a) historic,<sup>5</sup> b) potential,<sup>6</sup> c) future/no new action,<sup>7</sup> and the potential condition of aquatic and terrestrial habitats within the subbasin? Does the assessment include a determination of the difference between current conditions and the various reference conditions?</p>	

<sup>5</sup> The historic condition refers to the state of the environment at the time of European settlement, or 1850.

<sup>6</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>7</sup> The future/no new action condition is the state of the environment in 2050 assuming that current trends and current management continues.

<p>Reviewers: A useful table comparing current to historic conditions of thirteen habitat types is included. Maps of current vs. historic vegetation are also provided.</p> <p>Aquatic species habitat is assessed in detail at the reach scale, with habitat attributes summarized for each aquatic focal species. Discussions of limiting factors and human effects are included here.</p> <p>The current condition of the environment is described. The historical condition of the environment is probably not known. More information on the potential condition of the environment could be provided.</p>		Partial	2
I.C.1.2	Does the assessment classify 6 <sup>th</sup> field HUCs (or appropriate assessment units) within the subbasin according to the degree to which each area has been modified and the potential for restoration?		
Reviewers: Appropriate assessment units are used.		Yes	2
<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.		
<p>Reviewers: The descriptions of these outside factors are pretty cursory, especially for migratory birds for which they are critical. More detail is provided in the focal species discussions.</p> <p>Factors, such as upstream hydro-operations, affecting the focal fish species are not described.</p>		Partial	3
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: Assumptions about the impact of external effects are included in the discussion of focal wildlife species, although much more interpretive detail could be added.		Partial	3
<b>I.C.3. Environment / Population Relationships</b>			
For each focal species, does the assessment identify, for each life stage, environmental factors that are particularly important for the species' survival and determine the characteristics that constitute optimal conditions for species health? Does the assessment describe and make a finding regarding the environment's ability to provide such optimal conditions, or conditions that support the long-term viability of these populations.			
Reviewers: Habitat conditions for life stages are not complete for the focal fish species in Rock Creek.		Partial	1
<b>Summary comments and evaluation on the Environmental Conditions Section:</b> Does the assessment describe the effect of the environment on fish and wildlife populations?			
The Assessment and the majority of the Lower Mid-Columbia Mainstem Plan describe conditions mostly related to the Rock Creek watershed. Attention to other watersheds in the subbasin and the mainstem should be		Partial	2

given in future drafts.		
The descriptions of the effect of the environment on fish and wildlife populations are probably limited by the lack of available information.		

<b>I.D. Ecological Relationships</b>		
<i>Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?</i>	(Y)es, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>

<b>I.D.1. Inter-species Relationships</b>
Does the assessment identify important inter-species relationships or interactions, both positive and negative, with specific attention to relationships between anadromous fish and wildlife and specifically identify: 1) wildlife species and habitats that may be influenced, positively or negatively through direct effects of changes in fish abundance or fish community composition; 2) fish species and habitats that may be influenced, positively or negatively, through direct effects of changes in wildlife abundance or wildlife community composition; and 3) key species relationships within this subbasin based on the above?

Reviewers: The relationship of wildlife focal species with their habitats and with other species is well done. As with the two related subbasin plans, the entire Assessment has an ecological tone.  Fish focal species interactions with other fish species (including introduced species) and their habitats are not adequately described.	Partial	2
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<b>I.D.2. Processes and Functions</b>
Does the assessment identify key ecological functions for species within this subbasin and assess the current status of ecological processes and functions in the subbasin?

Reviewers: The key ecological functions are well described for wildlife focal species, but are incomplete for fish focal species.	Partial	2
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<b>I.E. Interpretation and Synthesis / Limiting Factors and Conditions</b>
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<b>I.E.1. Limiting Factors and Conditions</b>
Does the assessment describe: 1) <b>Historic factors or conditions</b> that led to the decline of each focal species and of ecological functions and processes? 2) <b>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 identified for each focal habitat and for each wildlife focal species within a habitat type. Working hypotheses are tied to these.  For the fish focal species, limiting factors are only adequately described for the white sturgeon.	Partial	1
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<b>I.E.2. Key Findings</b>		
Is the knowledge gained through the assessment synthesized in regard to: 1) the status of species, 2) the status of the subbasin environment, 3) the biological performance of focal species in relationship to the environment, 4) the health of the overall ecosystem, 5) potential conflicts and compatibilities between individual species and ecological processes, 6) a determination of the key factors that impede this subbasin from reaching optimal ecological functioning and biological performance?		
Reviewers: Key findings for wildlife species are summarized in tables that list, for each focal habitat, key findings, limiting factors and working hypotheses for each focal species.  Key findings for aquatic species are summarized by assessment area in tables that include finding, working hypotheses related to finding, level of uncertainty, biological objectives and strategies.	Yes	2
<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: “Working Hypotheses” are well done for each focal species and habitat, especially for wildlife.	Yes	2
<p><b>Overall impression and evaluation of the Assessment:</b> Does the assessment adequately synthesize the information regarding the health and functioning of this subbasin ecosystem? Does it adequately: a) bring together the single-species and community assessments to form a holistic view of the subbasin’s biological and environmental resources, b) provide a foundation for the development of scientific hypotheses concerning ecological behavior and the ways that human intervention might prove beneficial? As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please comment here (e.g., socio-economic descriptions or analysis).</p>		
Reviewers: This Assessment is well developed and provides a good foundation for development of an effective management plan. However, more information is needed on the physical environment of the remainder of the subbasin (other than Rock Creek) and the mainstem. Also out-of-basin effects for migratory birds need to be described.  Given the lack of information, uncertainties should be identified in the RME section.	Partial	2

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

II.A.1	Does the inventory identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?		
Reviewers: Areas with existing protections are not identified in the Inventory.		No	3
II.A.2	Does the inventory assess the adequacy of protections for fish, wildlife, and ecosystem resources?		
Reviewers: The adequacy of existing protections is not evaluated.		No	3
<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: Only a general listing of several monitoring and management projects is provided, but no real plans affecting fish and wildlife are described. The major entities responsible for various projects are listed. Extensive tables list ongoing projects with details for most about scope, duration, target species, and responsible parties. Gap analysis statements are not provided for any of the projects.		Partial	3
II.B.2	Does the inventory assess the extent to which existing plans are consistent with the subbasin assessment and their adequacy in protecting and restoring fish, wildlife, and ecosystem resources? (It is possible that this analysis is done in another section of the plan, e.g. in the management plan.)		
Reviewers: The missing gap analysis statements would provide this information. However, a final discussion section does identify gaps in information by subject area - a general "state of knowledge" discussion that synthesizes a lot of research. This is helpful.		Partial	3
<b>II.C. Management Programs / Restoration and Coordination Projects</b>			
Does the inventory identify management programs implemented through on-the-ground restoration and conservation projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife? These include, at a minimum, those implemented within the past five years regardless of funding source.			
II.C.1	Does the inventory identify ongoing or planned public and private management programs or initiatives that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas? <sup>8</sup>		
Reviewers: The listing of ongoing projects appears to cover all likely sponsors.		Yes	2
II.C.2	For each management program (or project where not clearly part of an overarching management program), does the inventory describe the program, project or activity; identify the management or lead entity; identify how the program/project was authorized and who is responsible for implementation; identify the funding source; and identify the relationship to other activities in the subbasin?		
Reviewers: Funding source and relationship to other activities not given.		Partial	2
II.C.3	For each management program (or project where not clearly part of an overarching management program), does the inventory identify limiting factors or ecological processes the activity is designed to address?		
Reviewers: Some management programs identify limiting factors or ecological processes they are designed to address indirectly, but none do in explicit reference to limiting factors identified in the assessment.		Partial	3

<sup>8</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?

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 listed for only a few completed projects in terms of outputs (e.g. plantings) but not impact. Failures are not assessed.		No	3
II.C.5	Does the inventory relate the assessment to the existing activities and identify the gaps between actions that have already been taken or are underway and additional actions that are needed to address the limiting factors and meet recovery and other goals, and identify inadequacies in both design and implementation?		
Reviewers: The subbasin plan's Assessment is not related explicitly to the projects, but this is done in a more general fashion in the summary discussion that follows the tables. A column in Table 17 is provided to identify needed gaps to be filled, but no entries are included.		Partial	3
	<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).		
Reviewers: The Inventory section of the plan is quite incomplete. Existing protections or plans are not listed; if they do not exist a statement to that effect should be inserted. Existing plans and management programs are provided in Table 17 as "projects" and the information about the projects is very general and does not identify the gaps that should be covered in a comprehensive management plan.		Partial	3

### III. The Management Plan

*(Derived from pages 12-16 of the Technical Guide.)*

*Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin management plan.*

These checklist tables incorporate Council Question 4, Consistency with the Provincial- and Basin-level Program: Are the vision, objectives, and strategies proposed in the subbasin management plan consistent with those adopted in the program for the province and/or basin levels? This is a three-part question and reviewers must be familiar with the vision, objectives, and strategies described in the 2000 Fish and Wildlife Program (pp. 13-33) and, for mainstem subbasin plans, the Mainstem Amendments (pp.11-28).

#### III.A. The Vision for the Subbasin

Does the Vision Section of the Management Plan 1) describe the desired future condition for the subbasin; 2) describe a vision that will drive development of the biological objectives and thereby the strategies that are incorporated to change conditions within the subbasin; and 3) incorporate the conditions, values and priorities of the subbasin in a manner that is consistent with the Vision described in the Council's 2000 Fish and Wildlife Program? (Council Question 4 to the ISRP):

(Y)es,  
(P)artial,  
(N)o

*Need for  
additional  
treatment  
(0-4)*

Reviewers: The vision statement is identical to those of the Big White Salmon and the Klickitat. These three subbasin plans are developed through the collaboration of WDFW, Yakama Nation, and the counties. The vision statement is a very general one, referring to healthy indigenous populations, community based decision-making, contribution to the economy, and adherence to legal responsibilities. Just about anything would fit into it, except that it does emphasize native species.

Yes

2

Since all three vision statements include "contribute to a sustainable economy" wording it would be nice if they stretched this a little further in the subbasin plan to indicate how they expect this to happen. Actions will have both benefits and costs and the objective would be to try to have the net benefits be positive over the long term.		
<b>III.B. Biological Objectives</b>		
Does the Biological Objectives Section of the Management Plan describe physical and biological changes within the subbasin needed to achieve the vision?		
Reviewers: The Management Plan is structured in the same way as those for the Big White Salmon and Klickitat subbasins. There is a reasonable amount of text describing the physical and biological changes within the subbasin needed to achieve the vision.	Yes	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. <sup>9</sup>		
Reviewers: As with the other two related plans, the biological objectives are loosely embedded in the introductory narrative and then presented in tables with strategies, actions and priorities. The tables are organized around focal habitats and species (wildlife) and around focal species (fish). The objectives are worded in general form (restore, protect, etc.) rather than in specifically measurable terms. So it would be difficult to monitor and evaluate progress toward meeting those objectives, and it is not possible from their current specification to determine what "success" looks like.  Tables do pull together objectives, strategies, actions and priorities in a systematic way that is directed toward addressing the limiting factors in the subbasin.	Yes	2
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 objectives are based on the Assessment. They are quite general in form. To be functional they will need to be listed in a more specific measurable form in the text as well as in the tables.	Yes	2
III.B.3. Where possible, are the biological objectives empirically measurable and based on an explicit scientific rationale; i.e., quantitative with measurable outcomes?		
Reviewers: Most of the plan's biological objectives are worded quite generally without target numbers or thresholds. The biological objectives also should be more quantitative with measurable outcomes.	Partial	3
III.B.4. Are biological objectives identified for both the short and long-term?		

<sup>9</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.

Reviewers: The planning horizon of the document is five to ten years. Distinctions within this period are made through the assignment of priorities to strategies. A high priority is based in part on an action's ability to be implemented in five years. The is doe better for wildlife than for fish.	Yes	1
III.B.5. Are the biological objectives complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin?		
Reviewers: The Inventory is too incomplete to determine if the biological objectives are complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin.	?	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? <sup>10</sup>		
Reviewers: There is only a brief statement that the biological objectives will be consistent with the CWA.	Partial	3
III.B.7. <i>Endangered Species Act</i> : The USFWS and NOAA Fisheries are developing recovery plans for listed species (bull trout, white sturgeon, salmon). Recognizing that those ESA-based efforts are in various states of completion across the Columbia basin (some efforts are well underway, others just beginning), does the management plan describe how the objectives of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin? <sup>11</sup>		
Reviewers: There is a brief statement that the biological objectives will be consistent regarding ESA recovery plans.	Partial	3
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: No additional comment.	na	na

### III. C. Strategies<sup>12</sup>

III.C.1. **Internal Consistency of the Plan.** Does the Strategies Section of the Management Plan explain the linkage of the strategies to the subbasin biological objectives, vision and the subbasin assessment? (Council Questions 2 and 3)<sup>13</sup>

<sup>10</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).

<sup>11</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>12</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.

Reviewers: Strategies are presented in the introductory text to the management matrix section, then are listed in the synthesis tables with objectives, limiting factors, etc. The strategies are logically connected to the limiting factors and to the objectives.	Yes	1
<b>III.C.2. Consistency with the Fish and Wildlife Program.</b> Are the Strategies proposed in the subbasin management plan consistent with those adopted in the program? (Council Question 4)		
Reviewers: The strategies appear to be consistent to the Fish and Wildlife Program, although no specific reference is made to it.	Yes	2
<b>III.C.3. Consideration of Alternative Management Responses.</b> Does the Strategies Section explain how and why the strategies presented were selected over other alternative strategies (e.g. passive restoration strategies v. intervention strategies)? (Council Question 5) <sup>14</sup>		
Reviewers: No detail of alternatives strategies is provided.	No	3
<b>III.C.4. Prioritization.</b> Does the Strategies Section describe a proposed sequence and prioritization of strategies?		
Reviewers: The prioritization of strategies is implied but not explicitly described.	Partial	3
<b>III.C.5. Additional Assessment Needs.</b> Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		
Reviewers: Additional assessment needs are not mentioned, although the list of actions does indicate a number of data gaps.	Partial	3
<b>III.C.6. Clean Water Act:</b> Does the management plan describe how the strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule within that particular state?		
Reviewers: Only a brief mention of the CWA is found in the biological objectives section.	Partial	3
<b>III.C.7. Endangered Species Act:</b> Recognizing that ESA-based efforts are in various states of completion across the Columbia basin, does the management plan describe how the strategies of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin?		
Reviewers: The plan does not describe any ESA-based efforts specific to the subbasin.	No	3

<sup>13</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.

<sup>14</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.

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

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

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

III.D.1	<b>Research:</b> Does the RME section of the plan describe a research agenda with specific conditions and situations identified in the subbasin that will require specific research studies to help resolve management uncertainties? Is the research agenda framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties? Does the RME section prioritize research topics that are of critical importance to the subbasin?	(Yes, (P)artial, (N)o	<i>Need for additional treatment (0-4)</i>
Reviewers: Needed research is described according to the type of limiting factor the project would address (e.g. channel connectivity, spawning gravel, etc), with goals, objectives and indicators specified.		Partial	3
III.D.2	<b>Monitoring Objectives:</b> Does the RME subsection identify what kind of information needs to be collected in order to determine if the plan’s vision and objectives are being met? I.e., what indicator variables will be monitored?	Partial	3
Reviewers: Monitoring objectives are described in only in a very general way.		Partial	3
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)?	Partial	3
Reviewers: Monitoring indicators are generally listed, but are not specific to the subbasin. For new aquatic projects, criteria/guidelines developed by the SRFB will be used.		Partial	3
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?	No	3
Reviewers: No data infrastructure is described.		No	3

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.			No	3	
	Reviewers: The coordination and implementation of data collection methods is not discussed except in the most general way for some projects ("encourage collaboration").	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?		Partial	3
	Reviewers: The RME section is more directed at a suite of projects than as part of the overall logic path, although the projects are tied to the strategies. For the fish species the RME section is primarily a guide taken from Washington State Salmon Recovery Funding Board documents and is really not specifically focused on 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).		Partial	3
	Reviewers: For the Rock Creek portion of the subbasin, the Management Plan presents a reasonable synthesis of objectives, limiting factors, and strategies designed to address the limiting factors. The wildlife section of the plan is better developed than the fish section. Objectives could be specified in a more measurable form. The plan does not have a lot of detail about implementation processes. It would have been good to see more of the "how to effectively deal with anthropogenic factors" section addressed.  A Management Plan has not been developed for the mainstem and other tributaries (beyond Rock Creek) in the subbasin.					

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

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

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

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

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

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

<p>Reviewers: The plan is strong on its ecological focus (Principles 1,2,4,5,6). It is lacking in explicit acknowledgement of scale and hierarchy (Principle 3). It is not experimental nor does it build in adaptive processes (Principle 7). It acknowledges the role of human actions Principle 8), but does not include much assessment about how to influence them. It would be good to know how cultural and economic factors are used in the selection of focal species and how they will be addressed in the implementation of strategies.</p> <p>The presentation discussions indicate that the implementation of restoration etc. for wildlife is explicitly considered and issues such as the social acceptability of restoration of beaver, for example, are examined. Some actions not considered acceptable are not included in the plan. This should be explicitly addressed in the plan: e.g. we chose X because... we chose not to do Y because...</p>	<p>Partial</p>	<p>1</p>
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