Imnaha Subbasin

Review Summary

The Imnaha Subbasin Plan amply demonstrates the unique nature of the subbasin and provides a good foundation for planning and meets many of the key scientific elements for a subbasin plan described in the Council's 2000 Fish and Wildlife Program and the Subbasin Planning Technical Guide. More work is needed on the plan before it could guide solicitation, development, and selection of fish and wildlife projects. The plan does well in considering socioeconomic factors, and it makes earnest attempts to prioritize objectives. As yet, however, the prioritization is too broad to provide operational guidance.

The plan has yet to demonstrate the important ecological functions and processes that must be restored in the Imnaha subbasin. It is unclear how the plan will address natural variation of influences within the basin and outside it. It does not make clear how biodiversity would be protected and restored. Overall, this plan inadequately considers the dynamic nature of ecosystems and the role of disturbance in shaping aquatic habitats. Also largely missing from the plan are the effects of exotic species. The plan makes scant mention of them, and offers no biological objectives or strategies that pertain to them.

Assessment

The Assessment provides a clear picture of the conditions and challenges faced by planners and managers within the subbasin. It is generally excellent with respect to aquatic fish population and habitat issues. It is very detailed in describing both aquatic and terrestrial species; this is a benefit of incorporating work done by several entities. Some key areas of the Assessment, however, need further development, especially the synthesis, analysis of limiting factors, hatchery effects, and the role of non-native species. Bringing in PATH and CRI results more explicitly would strengthen the limiting factors section.

Overall, the planners do a good job of gathering information, but do not analyze and synthesize the information to the degree needed to make the plan most useful.

The Subbasin Overview is well done. It generally describes or references geographical, demographical, and environmental contexts for fish and wildlife. Land ownership is well described. A noteworthy feature of the subbasin is that The Nature Conservancy is the subbasin's second largest land manager because it acquired the Zumwalt Prairie (with Fish and Wildlife Plan funding). It would be informative to find out how having a large swath of land permanently excluded from development affects the Imnaha subbasin's fish and wildlife.

The Assessment describes the subbasin by ecoregions. The Assessment has an adequate geologic description, of climate, maps of subregions, and good soil descriptions and maps. The maps are well done, but the descriptions of vegetation cover are quite brief. The Assessment has a reasonable description of wildlife habitat types.

The treatment of aquatic species did not appear to be distinctly ecological because the Assessment treats the stream systems purely from physical, largely hydrologic, standpoints and almost ignores biological components and processes.

The Assessment has good description of the historical and current major human uses of resources, including grazing, transportation, timber harvest, water development, and mining. There is also a very good discussion of human influences on specific hydrological processes; peak flow generation (timber, grazing); base flow depletion (withdrawals, water rights); erosion. There is also discussion on terrestrial processes including fire, insects, timber harvest, grazing, noxious weeds, and exotics. This is well done with good maps that illustrate these problems.

The Assessment adequately describes the watershed within a regional context. While the subbasin is small, it has a number of unique features and is a potentially productive component of the province and the Columbia Basin. The subbasin's context within the Columbia River Basin is demonstrated in the usual geographic way, but with the addition of a well-done section on the particular qualities of the terrestrial and aquatic environment that distinguish the Imnaha.

The Species Characterization and Status Subsection is broadly descriptive and highly informative. Although the detailed information in this section is impressive, the Assessment does not quite arrive at the "bottom line" of providing a comprehensive synthesis for each species, especially spring chinook. As a result, conclusions about the species' status and trends are not clear.

The Assessment presents five aquatic focal species and fourteen terrestrial focal species. The Assessment generally describes selection criteria adequately. Focal species' habitat is analyzed via QHA and according to previous USFS work. The Assessment identifies, to the apparent extent known, the current and historic status of the focal species. For aquatic species, this is done by using information developed by the TRT. This is also thoroughly done for terrestrial species.

In general terms, the Environmental Conditions Section describes the effect of the environment on individual fish and wildlife populations by disturbance type. The Assessment has good descriptions of the relation between macroclimatic and hydrologic processes, and of sediment transport and erosion. The Assessment offers general discussion of current, past, and future conditions. Providing more detail on these three reference conditions would strengthen the Assessment.

Factors limiting focal species habitat is analyzed in detail for both past and current conditions by habitat type and by habitat attributes, such as habitat diversity, fine sediment, high and low flows, and oxygen. Restoration priorities are identified for each species. Likely trends with and without action are described for each species. This is done in detail throughout the document and again in the limiting factors section, by type of focal species (aquatic vs. terrestrial) and by individual focal species (and life stage) at a "local" (sub-subbasin) scale to reflect the variation within the subbasin.

The Assessment does not include a quantitative assessment of the relative importance of each limiting factor, although it does have a rough qualitative Assessment through QHA. This may be

due to lack of good data. If out-of-basin factors are important, then the Assessment should discuss what gain in production would be achieved by various restoration or protection activities in-river. The Assessment has an insufficient examination of possible hatchery impacts.

Inventory
The Inventory has a useful, categorized listing of activities and projects. The planners provide sufficient lead-in information to permit useful integration and prioritization for future fish and wildlife projects. The plan's Assessment includes interpretive discussion, but this is not carried forward to the Inventory. The Inventory presents a complete picture of subbasin programs, protections and projects, but no information on accomplishments (or failures) in terms of biological results.

The Inventory identifies some data gaps, but the links back to the Assessment are not adequately presented. The planners appear to have gotten the logic path out of order. They have derived the gaps from the Management Plan rather than from the Inventory.

Management Plan
Overall, many areas of the Management Plan need elaboration and clarification, including prioritization of strategies, consistency of objectives and strategies, data needs, and research on stream-reach priorities.

The desired conditions in the subbasin are adequately described in the Assessment. In the Management Plan, tables link biological objectives to problems identified by the limiting factors analysis. The objectives are grouped according to aquatic, terrestrial, and socioeconomic categories. Some of the objectives in Table 4 are stated mainly in terms of performing procedures rather than in terms of desired outcome. Many of the biological objectives are stated qualitatively but not quantitatively.

The Management Plan's aquatic objectives present explicit abundance targets for fish, but provide no measurable outcomes for habitat. Most objectives would be measurable if they were to be stated in a more explicit form. The terrestrial habitat objectives are not expressed as specific acreage targets, but as trends, the Management Plan states that this is due to a lack of data. The terrestrial objectives are much more general that the aquatic objectives.

The reviewers applaud the attempt to include socioeconomic objectives. Most of the subbasins have not done this, and it is an important element. However, the socioeconomic objectives need more work to make them measurable and implementable.

All told, the Management Plan's biological and sociological objectives are not set forth in the detail necessary to be empirically measurable.

The planners prioritize reaches by the existence of multiple focal species, but they do not relate that prioritization back to the plan's objectives and strategies. It is unclear how the set of proposed objectives and strategies relate to reach prioritizations, and thus how the objectives and strategies are to function in the plan. In this sense, the plan lacks integration. The lack of prioritization of objectives and strategies coupled with the vague nature of the strategies leaves

the door open for any management intervention to be implemented. The plan's monitoring objectives are described in detail but not prioritized. The plan's operating assumptions are included. Prioritization is presented later in the monitoring and evaluation plan in detailed tables. It is not clear if these monitoring objectives are implementable because it is not certain if they provide a clear direction of what to do in sequence. Providing a clear direction would strengthen the plan.

The planners acknowledge that information is vital to adaptive refinement of their management over short and longer-term time frames. The subbasin plan is large, but it appears that when finished it will follow a basic logic path from action to evaluation to adapting future management.

The aquatic RME section is organizationally confused, and it does not follow through into adaptive management--except perhaps by vague implication in some places. The aquatic RME plan should be better organized, and empirical measures that can be used in adaptive management should be added to it.

Review Checklist

I. The Subbasin Assessment

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

I. A. Subbasin Overview

General Question to be addressed: Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin? The Council specifically asked that the independent scientific review evaluate whether the subbasin assessment was thorough and substantially complete. The following checklist is to aid reviewers in that determination.

I. A.1. General Description		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
I.A.1.1	Does the assessment provide a general orientation to the subbasin (location, size, distinguishing natural and cultural features, land use, land ownership) and an overview of jurisdictional authorities (state, county, federal lands, tribal lands and fishing rights)?		
Reviewers: The general description of the subbasin is lengthy, but it portrays the salient features of the watershed well. The description provides good maps that are used to locate the subbasin. Land ownership is well described. It is noteworthy that Nature Conservancy is second largest land manager in the subbasin because it owns Zumwalt Prairie.		Yes	0
I.A.1.2	Does the assessment provide a general description of the subbasin's macro-environment (geology, climate and weather, land cover, vegetation) and of the subbasin's water resources (hydrography and watersheds, hydrologic regimes, water quality, riparian and wetland resources), water uses, and modifications to water resources (hydropower projects and operations, water diversions, channel modifications)?		

Reviewers: Section 1.1.3.1, “Influence of Natural Ecologic Processes on Aquatic Systems,” treats the stream systems purely from physical, largely hydrologic, standpoints and almost ignores biological components and processes. The failure to account for the riparian and watershed plant mantle and its functions in the ecology of streams is a major shortcoming. The section covers "Macroclimate and Peak Flows," "Macroclimate and Base Flows," and "Erosion Processes." About the only ecological relationship shown is that in the subsection on “Macroclimate and Base Flows,” which cites a study that correlates annual runs of Columbia River chinook salmon with a climate index; and another study is cited on Imnaha salmon that may have sometimes followed a similar pattern. Similarly, Section 1.1.3.3 “Human Influence on Conditions and Processes in Aquatic Systems,” addresses influences such as timber harvest and agriculture/grazing only in relationship to hydrologic conditions. The section should also include a major discussion of the human influences on riparian vegetation functions and their effect on fish habitat. The Assessment describes the subbasin by ecoregions. The Assessment’s geology description is adequate. The Assessment includes a good description of the climate and maps by subregion, and good soil descriptions and maps. The maps are well done, but the descriptions of vegetation cover are quite brief. The Assessment has a reasonable description of wildlife habitat types. Hydrography is adequately described in the plan. A summary table of 303(d) listed streams and listing parameters is included. These are related to the bull trout recovery plan. The water use description is adequate, although including more interpretive details such as the degree of appropriation, and other constraints would be useful The riparian and wetlands habitats are well described. The plan has good discussions of the historic effects of climate, erosion, fire, and grazing.		Partial	2
I.A.1.3	Does the assessment provide a general description of anthropogenic disturbances to the aquatic and terrestrial environment, organized by the source of disturbance (urbanization, agriculture, forest practices, water development, mining, transportation, and other)?		
Reviewers: The Assessment clearly defines the nature and extent of past, present, and future challenges in terms of watershed (both in-channel and out of channel) uses and disturbances. While the watershed is sparsely populated, there is considerable disturbance due to grazing, timber extraction, and water withdrawal. The plan has a good description of the past and current major human uses of resources including grazing, transportation, timber harvest, water development, and mining. The discussion of human influences on specific hydrological processes (peak flow generation, timber, and grazing); base flow depletion (withdrawals, water rights, and erosion) is excellent. There		Yes	1

is also a good discussion on terrestrial processes, including fire, insects, timber harvest, grazing, noxious weeds, and exotics. This is very well done with good maps that illustrate these problems. The Assessment makes good use of data in its descriptions of resource uses. The plan has a good overall description, that is primarily concerned with agricultural and public lands, and gives little attention to municipality's effects on the ecosystem. Including more information on urban or town effects on the subbasin would be useful.			
I.A.1.4	Does the assessment provide a list of native and non-native fish and wildlife species present in this subbasin including those species that: a. have been designated as threatened or endangered under the Federal Endangered Species Act or state equivalents, b. have been recognized by applicable federal, state, or local resource management agencies, or by the Nature Conservancy or state heritage program, as being especially rare or significant in the local area, c. have special ecological importance within the subbasin, d. are recognized by Native American tribes as having special cultural or spiritual significance, or e. are not native to this subbasin?		
Reviewers: The plan includes lists of state and federal listed species along with Oregon "sensitive species", USFS sensitive species, and Partners in Flight species. This information is included in tables, with short descriptions of their status in the text. There are also tables of managed species, and a short description of extirpated and introduced species. The fish and wildlife descriptions appear complete and comparable to other subbasins in the province. It does not appear, however, that the plan included a list of exotics such as brook trout and mysids. Including non-native species would further enrich the plan.		Yes	0
I.A.1.5	Does the assessment identify plants that have been designated as threatened or endangered under the Federal Endangered Species Act or state equivalents, and/or that are recognized by Native American tribes as having special cultural or spiritual significance, or (optional) that have special ecological importance within the subbasin?		
Reviewers: The plant biotic descriptions appear to be complete and comparable to other subbasins in the province. The Assessment also includes a short but adequate description of plants that are important to the subbasin's American Indian tribes.		Yes	0
I.A.2. Subbasin in the Regional Context		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
I.A.2.1	Does the assessment describe how this subbasin fits within its regional context (size in relation to the total Columbia Basin, placement within the ecological province and relationship to other subbasins in this province, qualities that distinguish this subbasin from others in the province)?		

Reviewers: The Assessment adequately describes the watershed within a regional context. While the subbasin is relatively small, it has a number of unique features that make it a potentially productive component of the province and the Columbia Basin. The subbasin's position in the Columbia River basin is demonstrated in the usual geographic way, but with the addition of a well-done section on the particular qualities of the terrestrial and aquatic environment that distinguishes the Imnaha. The "biodiversity and endemism" discussion, however, gets a little off the track. Too much information is taken from the Nature Conservancy assessment without interpretation to the subbasin; the Nature Conservancy assessment is too general and broad in spatial scale to serve the subbasin Assessment's purposes. At the end of this discussion there is a short paragraph on the Imnaha contribution to the ecoregion; this should be the focus of the subbasin discussion. Adding more detail specific to the subbasin and making this a thrust of the section would augment the plan.		Yes	0
I.A.2.2	Does the assessment describe this subbasin's relationship to Endangered Species Act planning units (NOAA Fisheries-designated evolutionarily significant units (ESU) and U.S. Fish and Wildlife Service-designated bull trout planning units.[1]) where this information was available during the planning process?		
Reviewers: The Assessment adequately describes the context of the biota within NOAA Fisheries salmon ESUs and USFWS Bull Trout Planning Units.		Yes	0
I.A.2.3	Does the assessment summarize external environmental conditions that might have an effect on fish and/or wildlife in this subbasin (the ocean, the estuary, the mainstem downstream from the subbasin, and, as relevant, upstream areas and adjacent subbasins)?		
Reviewers: The Assessment adequately summarizes external environmental conditions that might have an effect on the subbasin's fish and wildlife in the "human influences on processes" section to the extent that present data and state of knowledge permit. The Assessment includes little quantitative analysis of the effects of individual factors.		Yes	0
I.A.2.4	Does the assessment identify macroclimate and human occupation and use trends that may affect hydrological or ecological processes in this subbasin over the long-term (50 years into the future and beyond)?		
Reviewers: The Assessment identifies macroclimate and human use trends within a reasonable capacity to predict such trends. Especially intriguing is the apparent relationship between precipitation within an annual cycle and the productivity of salmon in the watershed. Macroclimate information is provided in the "human influences on processes" section. Adding forward projections here would augment the		Partial	1

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

plan. In some subbasins, human occupation will be a major factor, but in other basins changes such as juniper expansion could lead to significant changes in hydrology. For this subbasin plant succession is not adequately covered.		
	Summary comments and evaluation on the Subbasin Overview: Does the assessment provide the geographical, demographical, and environmental context for fish and wildlife resources in this subbasin?	
Reviewers: Overall, the planners have done a good job on the subbasin overview. The Assessment generally describes or references geographic, demographic, and environmental contexts for fish and wildlife within the subbasin. The treatment of aquatic species does not appear to be distinctly ecological because the plan treats the stream systems purely from physical, largely hydrologic, standpoints and almost ignores biological components and processes.	Partial	1

I.B. Species Characterization and Status *General question: Does the assessment adequately describe the current status of fish and wildlife focal species?* Note to reviewers: for this section of the review, the checklist should be applied to each focal species. Please identify which species your evaluation applies to in the comment field. Use the ranking fields (Y,P,N; 0-4) to give an overall evaluation across all focal species. Note differences among approaches to species in the comment field. If necessary, once the plans are received, assignments will be made to cover an individual species or a series of focal species.	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
I.B.1. Does the assessment identify a series of focal species that will be used to characterize the status of fish and wildlife species within the subbasin? These should include one or more wildlife, resident fish, and, where present, anadromous fish species. Anadromous fish may also be included in subbasins where they were historically present and where there is a reasonable probability that these fish could be restored to sustainable levels. Criteria suggested for selecting focal species include a) designation as Federal endangered or threatened species, b) local ecological significance,[2] and c) cultural significance.		
Reviewers: The Assessment identifies five aquatic focal species and fourteen terrestrial focal species. In most cases, the rationale for including each species was obvious; however, the plan provides no rationale for excluding nonfood species such as dace or sculpins. Pacific lamprey is the sole representative of species with no commercial importance. Inclusion of one or more sculpin or dace would complete the breadth of ecologically important resources to the watershed that are represented in the plan by focal species. The plan generally provides adequate description of selection criteria used for focal species. Focal species' habitat is described using QHA and by	Yes	1

[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.

work done by the USFS. Terrestrial species habitat use by habitat type is well described. Why is Pacific lamprey included if data on it are so limited?		
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: The Assessment identifies, to the apparent extent known, the current and historic status of the focal species it has selected. For aquatic species, using information developed by the TRT does this. This is also thoroughly done for terrestrial species. Good literature citations are provided. The Assessment has little information about the possible meta-population structure of the species. Providing more information on this subject would augment the plan.	Yes	2
I.B.3. Does the assessment describe the current and historic status of each focal species population and summarize available population data (abundance, productivity, spatial structure, etc., with particular emphasis on trend data)?		
Reviewers: The Assessment thoroughly describes the current and historic status of the focal species along with their trend data. The plan makes good use of data and graphs for aquatic and terrestrial species.	Yes	1
I.B.4. Does the assessment describe the population's life history, including identifying distinct life stages?		
Reviewers: The Assessment describes life histories for each species including the bull trout's life history complexity (i.e., fluvial, adfluvial, resident). These descriptions are thoroughly done, and based on TRT work. The descriptions include hatchery production. For some species little life history information is provided. Adding complete life history descriptions for all of the species would augment the plan.	Yes	2
I.B.5. Does the assessment characterize the genetic diversity of the population, especially regarding possible effects of artificial production? Specifically does the assessment describe the historic and current status of introductions, artificial production, or captive breeding programs in this subbasin or affecting the subbasin through straying or other means, and describe the relationship between the artificial and naturally produced populations?		
Reviewers: The Assessment uses TRT information to adequately characterize and completely describe the genetic diversity of populations. Genetic information is particularly available for salmonid species (see Waples 1993). For chinook, the subbasin apparently harbors a relatively unique divergent gene pool from other Snake River populations, suggesting a need to differentially manage this population.	Yes	0
I.B.6. Does the assessment describe historic and current harvest, including both in-subbasin harvest and downstream or ocean harvest affecting the focal species?		

Reviewers: The Assessment describes in-subbasin harvest and out-of-basin harvest affecting populations for each of the aquatic focal species except, perhaps, bull trout. Excluding species such as the bull trout is a general trend because such species have not been commonly targeted for harvest, or been a focus of other concern, until recently. The plan explicitly acknowledges missing data.		Yes	1
	Summary comments and evaluation on the Species Characterization and Status Subsection: Does the assessment adequately describe the current status of fish and wildlife focal species?		
Reviewers: The subsection on species characterization and status is broadly descriptive and highly informative. Although the detailed information in this section is impressive, the plan does not quite arrive at the "bottom line" of providing a comprehensive synthesis for each species, especially spring chinook. This means that what can be concluded about the species' status and trends from the data presented is not clear.		Yes	2

I.C. Environmental Conditions *General question to be addressed: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?*			
I.C.1. Environmental Conditions within the Subbasin		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
I.C.1.1	Does the assessment describe the current condition of the environment in this subbasin, and characterize the condition of the environment under the following reference conditions: a) historic,[3] b) potential,[4] c) future/no new action,[5] and the potential condition of aquatic and terrestrial habitats within the subbasin? Does the assessment include a determination of the difference between current conditions and the various reference conditions?		
Reviewers: The plan has good descriptions of the relation between macroclimate and hydrologic processes, and of sediment transport and erosion. The plan discusses current, historical, and future conditions in general. Providing more detail on these three reference conditions would strengthen the plan.		Partial	2
I.C.1.2	Does the assessment classify 6th field HUCs (or other appropriate assessment unit) within the subbasin according to the degree to which each area has been modified and the potential for restoration?		
Reviewers: The Assessment identifies 47 6th field HUC reaches. It also identifies specific HUC reaches that are important to each focal species and describes their condition. The 6th field HUCs are used for the QHA assessment. The plan provides little quantitative assessment of relative impacts within each HUC. Adding more information to these quantitative assessments would strengthen the plan.		Yes	1

[3] The historic condition refers to the state of the environment at the time of European settlement, or 1850.
[4] The potential condition is defined as the optimal condition for the subbasin in the year 2050, but it acknowledges cultural modifications that are not reversible such as urbanization.
[5] The future/no new action condition is the state of the environment in 2050 assuming that current trends and current management continues.

I.C.2. Out-of-Subbasin Effects and Assumptions			
I.C.2.1	Does the assessment identify factors outside of the subbasin that have a significant effect on each focal species, with particular attention to bottlenecks? These might include effects associated with upstream conditions, downstream conditions, and, in the case of migratory wildlife, conditions in adjacent subbasins. Outside effects are particularly relevant for anadromous fish and may include mainstem passage and habitat, estuary conditions, ocean conditions, and harvest.		
Reviewers: The Assessment identifies factors outside of the subbasin that have a significant effect on each focal species, describing them in general terms for both aquatic and terrestrial species rather than by individual species. As such many of the factors apply across the board.		Yes	1
I.C.2.2	For each focal species, does the assessment establish assumptions for each external effect that can be used to calculate the effects of external conditions on the productivity and sustainability of fish and wildlife within this subbasin?		
Reviewers: The Assessment offers little quantitative analysis of external effects, however, it does provide some quantitative assessment of the relative effects of out-of-basin vs. in-river impacts based on Petrosky. The Assessment should have made more use of the PATH and CRI analyses. Utilizing the information found in these studies would augment the plan.		Partial	2
I.C.3. Environment / Population Relationships For each focal species, does the assessment identify, for each life stage, environmental factors that are particularly important for the species' survival and determine the characteristics that constitute optimal conditions for species health? Does the assessment describe and make a finding regarding the environment's ability to provide such optimal conditions, or conditions that support the long-term viability of these populations.			
Reviewers: The Assessment identifies environmental factors that are particularly important for the species' survival in detail in the focal species sections. The "environment-population" section is a summary list of citations to the appropriate literature for aquatic species and, with a little more detail, for terrestrial species, in terms of key ecological functions (KEFs). A short description of the KEFs provided by salmon for other wildlife is taken out of the Johnson and O'Neill publication. This is a general description that is not specific to the Imnaha Subbasin. The Assessment does not specify optimal conditions.		Partial	3
	Summary comments and evaluation on the Environmental Conditions Section: Does the assessment adequately describe the effect of the environment on fish and wildlife populations?		
Reviewers: Much of the information in the Environmental Conditions Section makes up for the deficiencies noted in I.A.1.2, above. Theses two sections should be coordinated. In general terms this section does describe the effect of the environment on individual fish and wildlife populations by disturbance type.		Partial	2

I.D. Ecological Relationships *Question to be addressed: Does the assessment describe the key inter-species relationships and the key functional relationships?*	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
I.D.1. Inter-species Relationships Does the assessment identify important inter-species relationships or interactions, both positive and negative, with specific attention to relationships between anadromous fish and wildlife and specifically identify: 1) wildlife species and habitats that may be influenced, positively or negatively through direct effects of changes in fish abundance or fish community composition; 2) fish species and habitats that may be influenced, positively or negatively, through direct effects of changes in wildlife abundance or wildlife community composition; and 3) key species relationships within this subbasin based on the above?		
Reviewers: The plan asserts that aquatic species are largely independent of terrestrial species. It does not, however, examine how terrestrial processes impact aquatic habitat and species. The plan does not appear to have any knowledge on the interactions between fish species. Examining these interactions would strengthen the plan. The aquatics and terrestrial analyses do not adequately take a watershed view; this is especially true for aquatics. The benefits of wildlife projects for aquatic species and habitat are not described. The role of exotic plant species and particularly noxious weeds is described in terms of their effect on key ecological functions of terrestrial habitats. A table of fourteen species of noxious weeds found in the subbasin is provided. The text indicates that exotic plants are not yet as well established in the Imnaha as in some other subbasins.	Partial	3
I.D.2. Processes and Functions Does the assessment identify key ecological functions for species within this subbasin and assess the current status of ecological processes and functions in the subbasin?		
Reviewers: The Assessment describes key ecological functions for species within this subbasin and assesses the current status of ecological processes and functions in the subbasin for the aquatic species. The plan includes a very detailed discussion of the condition of terrestrial habitat by a number of key attributes, and it describes the relationship of those attribute conditions to terrestrial species. Including a more comprehensive discussion of disturbance regimes and how they shape habitat and contribute to natural variation would strengthen the plan. For example, the Assessment describes the flow regime but does not link it to the biological production within streams.	Partial	2

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

I.E.1. Limiting Factors and Conditions

Does the assessment describe:
1) Historic factors or conditions that led to the decline of each focal species and of ecological functions and processes?

2) Current key factors or conditions within and without the subbasin that inhibit populations and ecological processes and functions relative to their potential.

Reviewers: The plan presents limiting factors in detail with specifics presented by species within assessment units. Factors limiting focal species' habitat are described using QHA and work done by the USFS. This is provided in good detail for both historical and present conditions by habitat type and habitat attributes such as habitat diversity, fine sediment, high and low flows, and oxygen. Habitat attributes are discussed thoroughly and compared in terms of historical and present conditions. QHA is used as an assessment tool at the 6th field HUC level. Detailed QHA-generated protection and restoration rankings are presented in tables and also mapped. Restoration priorities are identified for each species. Likely trends with and without action are described for each species. This is done in very good detail throughout the document and again in the limiting factors section, by type of focal species (aquatic vs. terrestrial) and by individual focal species (and life stage) at a "local" (sub-subbasin) scale to reflect the variation within the subbasin. The plan has no quantitative assessment of the relative importance of each limiting factor, although it does present the qualitative assessment conducted using QHA. This may be due to the lack of good data. Because out-of-basin factors are important, the plan should discuss what gain in production would be achieved by various restoration or protection activities in-river. The plan has an insufficient assessment of possible hatchery impacts. The plan's analysis of limiting factors for wildlife is not well justified by descriptive text or data analysis. The planners use the Assessment to reach extensive, intensive, and potentially counterproductive wildlife management actions.	Partial	3

I.E.2. Key Findings

Is the knowledge gained through the assessment synthesized in regard to: 1) the status of species, 2) the status of the subbasin environment, 3) the biological performance of focal species in relationship to the environment, 4) the health of the overall ecosystem, 5) potential conflicts and compatibilities between individual species and ecological processes, 6) a determination of the key factors that impede this subbasin from reaching optimal ecological functioning and biological performance?

Reviewers: The plan's examination of key findings provides much useful information, but it is not brought together to give an overall picture of the species, environment, and priority limiting factors in the subbasin. Synthesis is largely lacking for species status, overall health of the ecosystem, and potential conflicts among species. The planners do well in gathering the information for the earlier components of the Assessment, but do not analyze and synthesize the information to the degree needed to make the plan most useful.	Partial	3
I.E.3. Subbasin-wide Key Assumptions/Uncertainties ("Working Hypothesis") Does the assessment describe the key assumptions (including uncertainties) that have been made in the "Key Findings" above, and document the data sources and/or analytical tools relied upon?		
Reviewers: The Assessment has little discussion of key assumptions, and uncertainties. The working hypotheses and data needs are discussed more thoroughly in other parts of the plan.	Partial	2
	Overall impression and evaluation of the Assessment: Does the assessment adequately synthesize the information regarding the health and functioning of this subbasin ecosystem? Does it adequately: a) bring together the single-species and community assessments to form a holistic view of the subbasin's biological and environmental resources, b) provide a foundation for the development of scientific hypotheses concerning ecological behavior and the ways that human intervention might prove beneficial? As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please comment here (e.g., socio-economic descriptions or analysis).	
Reviewers: The Assessment provides a clear picture of the conditions and challenges faced by planners and managers within the subbasin. It is generally excellent with respect to aquatic fish population and habitat issues. It is very detailed in describing both aquatic and terrestrial species; this is a benefit of incorporating work done by several entities. Some key areas of the Assessment, however, need further development, especially the synthesis, analysis of limiting factors, hatchery effects, and the role of non-native species. Bringing in PATH and CRI results more explicitly would strengthen the limiting factors section. Overall, the planners do a good job of gathering information, but do not analyze and synthesize the information to the degree needed to make the plan most useful.	Partial	3

II. The Inventory

(This checklist section was developed from pages 11-12 of the Technical Guide.)
Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin inventory, specifically whether the inventory includes an assessment of the adequacy of current legal protections, plans, and projects to protect and restore fish, wildlife, and ecosystem resources. Does the inventory adequately synthesize past activities and their biological achievements? Planners were requested to, as applicable, describe the extent to which these programs and activities extend beyond the subbasin to a larger scale (provincial and basin-wide).

II.A. Existing Protection		*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
II.A.1	Does the inventory identify areas with protections through stream buffers, municipal or county ordinances, conservation designations, or water resources protection?		
Reviewers: Areas with protection status are identified in the Assessment. Protection status is well described and mapped in the Inventory.		Yes	0
II.A.2	Does the inventory assess the adequacy of protections for fish, wildlife, and ecosystem resources?		
Reviewers: The adequacy of protections is only assessed in the ranking of degree of protection from "high" to "low." Providing more details on the adequacy of protections would further enhance the plan.		Partial	1
II.B. Existing Plans			
II.B.1	Does the inventory identify and review applicable local, state, tribal, and/or federal fish and/or wildlife management plans and water resource management plans that affect fish and wildlife?		
Reviewers: The Inventory offers a table of information (Table 7) summarizing applicable local, state, tribal, and/or federal fish and/or wildlife management plans by area and sponsor. The table identifies the area covered in the plans, and, for some, the goals and key ecological functions addressed.		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: The Inventory does not 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.		No	3
II.C. Management Programs / Restoration and Coordination Projects Does the inventory identify management programs implemented through on-the-ground restoration and conservation projects that target fish and wildlife or otherwise provide substantial benefit to fish and wildlife? These include, at a minimum, those implemented within the past five years regardless of funding source.			
II.C.1	Does the inventory identify ongoing or planned public and private management programs or initiatives that have a significant effect on fish, wildlife, water resources, riparian areas, and/or upland areas?[6]		
Reviewers: The Inventory describes ongoing projects in tabular format. Much of the activity in the subbasin is tiered to overarching programs such as USFS ICBEMP or PACFISH, etc. These programs are extensively described in the Assessment, and then summarized in tables in the Inventory.		Yes	0
II.C.2	For each management program (or project where not clearly part of an overarching management program), does the inventory describe the program, project or activity; identify the management or lead entity; identify how the program/project was authorized and who is responsible for implementation; identify the funding source; and identify the relationship to other activities in the subbasin?		
Reviewers: No additional reviewer comment.		Yes	0

[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?

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 limiting factors of some management programs are identified in tables summarizing programs, plans and projects. Providing this information for all of the management programs would further enrich the plan.		Partial	2
II.C.4	For each management program (or project where not clearly part of an overarching management program), does the inventory summarize accomplishments/failures of activity		
Reviewers: The management programs are extensively summarized by "restoration category" (meaning type of action) in tables in the Assessment. In the Inventory, accomplishments are identified for some programs. The biological results of the restoration or protection actions are not shown, and failures are not assessed. Analyzing the biological results and acknowledging project failures would strengthen the plan.		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: Section 6 is dedicated to the gap analysis. The plan provides a very good interpretive summary of past and present projects and programs in the Assessment. It identifies areas of emphasis, degree of success, and gaps. The planner's presentation of "gap identification" indicates that they have gotten the logic path out of order. Gaps are derived from the Management Plan rather than the Inventory and the links back to the Assessment's limiting factors are not adequately presented. A number of research, monitoring and action priorities are identified without much explanation other than "the technical team says..." The synthesis is not done, although some of the synthesis shows up in the first part of the Management Plan in "problem statements."		Partial	2
II.C.5	**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).		
Reviewers: The Inventory provides a useful, categorized listing of activities and projects. The planners provide sufficient lead-in information to permit useful integration and prioritization for future fish and wildlife projects. The Assessment offers good interpretive discussion, but this is not carried forward to the Inventory. The Inventory presents a complete picture of subbasin programs, protections and projects, but no information on accomplishment in terms of biological results. This information is important; including it would strengthen the plan.		Partial	2

III. The Management Plan

(Derived from pages 12-16 of the Technical Guide.)
Reviewers should consider the soundness, completeness, analytical approach, and transparency (documentation of methods and decision-making process) of the following components of a subbasin management plan.

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

III.A. The Vision for the Subbasin Does the Vision Section of the Management Plan 1) describe the desired future condition for the subbasin; 2) describe a vision that will drive development of the biological objectives and thereby the strategies that are incorporated to change conditions within the subbasin; and 3) incorporate the conditions, values and priorities of the subbasin in a manner that is consistent with the Vision described in the Council's 2000 Fish and Wildlife Program? (Council Question 4 to the ISRP):	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
Reviewers: The plan's vision statement generally describes the subbasin's desired future conditions and establishes a conceptual framework to reach them. The historical and present ecological and cultural values of subbasin are included. A number of "guiding principles" covering process and outcomes are also listed.	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 desired conditions in the subbasin are adequately described in the Assessment. In the Management Plan, tables link biological objectives to problems identified by the limiting factors analysis. The objectives are grouped in aquatic, terrestrial, and socioeconomic categories. Some of the objectives in Table 4 are stated mainly in terms of performing procedures rather than in terms of desired outcome. Many of the biological objectives are stated qualitatively but not quantitatively. A more comprehensive discussion of aquatic non-native effects would strengthen the plan. The plan does not mention how out of subbasin effects will be addressed. Examining out-of-subbasin effects, or describing a strategy to do so, would improve the 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]

[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.

Reviewers: The plan's biological objectives are consistent with basin-level visions, objectives, and strategies adopted in the Council's Fish and Wildlife Program.	Yes	0
III.B.2. Are the biological objectives based on the subbasin assessment? (This question relates to the Logic Path in the subbasin plan. Question III.C.1 is a similar question for the Strategies Section.)		
Reviewers: The biological objectives are adequately based on the subbasin Assessment.	Yes	0
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: The plan's biological objectives present explicit abundance targets for anadromous species, but provide no measurable outcomes for habitat. Most objectives would be measurable if they were to be stated in a more explicit form. Aquatic habitat objectives are quite general descriptions of desired conditions rather than quantified specific targets. In contrast, adult return objectives for Chinook, steelhead and bull trout (Table 5) are specified in numbers and are measurable. Terrestrial habitat objectives are not expressed as specific acreage targets, but as trends. The Management Plan states that this is due to lack of data. The reviewers applaud the attempt to include socioeconomic objectives. Most of the subbasins have not done this, and it is an important element. However, the socioeconomic objectives need more work to make them measurable and implementable. As stated they are tasks rather than objectives, and are not measurable. For example, instead of "consider impacts…" the objective could be worded as, "To provide information on the economic impact of fish and wildlife actions." The associated strategy would be to, "analyze costs and benefits of alternative strategies." The three socioeconomic objectives should be reworked with the help of a social scientist into a measurable form. All told, this plan's biological and sociological objectives are not set forth in the detail necessary to be empirically measurable.	Partial	3
III.B.4. Are biological objectives identified for both the short and long-term?		
Reviewers: The planners have adopted a ten to fifteen year horizon citing the long-term need to restore many lost elements and ecological functions. Short-term objectives are not identified.	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: The plan's biological objectives appear to be complementary to programs of tribal, state and federal land or water quality management agencies in the subbasin, but this is not stated explicitly.	Yes	1
III.B.6. *Clean Water Act*: Does the management plan describe how the objectives and strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule within that particular state? I.e., does this subsection of the management plan assess and describe the consistency-coordination-findings of the Water Quality Plan with the subbasin plan?[8]		
Reviewers: The plan adequately describes how the objectives and strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule. This is outlined in Section 5.2.	Yes	0
III.B.7. *Endangered Species Act*: The USFWS and NOAA Fisheries are developing recovery plans for listed species (bull trout, white sturgeon, salmon). Recognizing that those ESA-based efforts are in various states of completion across the Columbia basin (some efforts are well underway, others just beginning), does the management plan describe how the objectives of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin?[9]		
Reviewers. The plan adequately demonstrates that it is reflective of and integrated with the ESA-based goals for listed species within the subbasin. This is outlined in Section 5.1.	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: The plan does not address any disagreements that may have occurred between co-managers. If disagreements did not exist and objectives are consensus objectives, the plan should note this.	na	na

III. C. Strategies[10]
III.C.1. **Internal Consistency of the Plan.** Does the Strategies Section of the Management Plan explain the linkage of the strategies to the subbasin biological objectives, vision and the subbasin assessment? (Council Questions 2 and 3)[11]

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

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

[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

Reviewers: The plan's strategies are directly linked to its objectives and to the limiting conditions identified in the Assessment, and are generally headed in the right direction, but currently are so general and vague as to encompass almost any management intervention. The terrestrial habitat strategies do not have specific acreage numbers, but appear to be reasonably specific. After the summary tables, strategies are tied to objectives that address particular problems. In this section aquatic and terrestrial objectives may be grouped together because they address the same problem. The plans strategies to address socioeconomic objectives and problems are quite weak. They lack specific content so it is not clear how they would be done. They planners show good intent, but the socioeconomic strategies need some work to develop them to an implementable form. For example, how will negative economic impacts be minimized? What approaches could be taken? How will positive cultural impacts be maximized? What approaches could be taken?	Partial	2
III.C.2. **Consistency with the Fish and Wildlife Program.** Are the Strategies proposed in the subbasin management plan consistent with those adopted in the program? (Council Question 4)		
Reviewers: The plan's strategies are generally consistent with those in the Fish and Wildlife Program, but the subbasin plan does not include strategies aimed at non-native species. Addressing exotic species more thoroughly in general, and developing strategies to deal with them, would strengthen the plan.	Partial	2
III.C.3. **Consideration of Alternative Management Responses.** Does the Strategies Section explain how and why the strategies presented were selected over other alternative strategies (e.g. passive restoration strategies v. intervention strategies)? (Council Question 5)[12]		
Reviewers: The plan does not explain how or why the strategies presented were selected over other alternative strategies. If no alternative strategies were considered than the plan needs to say so.	No	3
III.C.4. **Prioritization.** Does the Strategies Section describe a proposed sequence and prioritization of strategies?		

the problems identified by the subbasin assessment; i.e., does the Strategies Section take into account not only the desired outcomes, but also the physical and biological realities of the subbasin environment. The ISRP's Subbasin Plan Logic Path flow chart, attached below, provides a straightforward illustration of the logic path reviewers should look for in subbasin plans. Rick Williams, ISRP chair, developed and has presented this flow chart to subbasin planners around the basin, emphasizing the importance that subbasin plans demonstrate a clear logic path.

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

Reviewers: The plan clearly identifies highest and moderate priority protection and restoration reaches. The Management Plan provides a long list of strategies. These are not prioritized except by implication from the statements about problems identified as most important by the technical team. Later, in the monitoring and evaluation section, QHA results are used to prioritize 6th field HUCs into "restore," "protect/restore," and "protect" categories. The technical group develops priorities, but the plan does not specify the information used to prioritize them. Adding this information would help reviewers analyze the utility of a particular strategy. The planners prioritize reaches by the existence of multiple species, but they do not relate their prioritization back to their objectives and strategies. It is unclear how the set of proposed objectives and strategies relate to reach prioritizations, and thus how the objectives and strategies are to function in the plan. In this sense the plan lacks integration. The lack of any prioritization of objectives and strategies coupled with the vague nature of the strategies leaves the door open for any management intervention to be implemented. The terrestrial section is not based on the kind of analysis intended for the subbasin planning effort; e.g. they have crested wheat grass planting as a strategy, but this is not up-to-date wildlife biology, in fact, planting crested wheat grass has proven to be a failure as a restoration measure. Developing a specific prioritization of strategies would augment the efficacy and utility of the plan. The planners should know which strategy they would use, where they would use it and how they would apply it if they were given limited funds.	Partial	3
III.C.5. **Additional Assessment Needs.** Does the Strategies Section describe, if necessary, additional steps required to compile more complete or detailed assessment?		
Reviewers: Additional assessment needs are described in the monitoring and evaluation section. For each species and reach additional data needs have been identified to guide RME.	Yes	1
III.C.6. **Clean Water Act:** Does the management plan describe how the strategies are reflective of and integrated with the water quality management plan and Total Maximum Daily Load schedule within that particular state?		
Reviewers: The plan includes a reference to the development of a TMDL plan in Section 5.2. There is a good detailed discussion of TMDL in the monitoring and evaluation section.	Yes	0
III.C.7. **Endangered Species Act:** Recognizing that ESA-based efforts are in various states of completion across the Columbia basin, does the management plan describe how the strategies of the subbasin management plan are reflective of and integrated with the ESA-based goals for listed species within the subbasin?		

Reviewers: The plan has an explicit reference to ESA and the biological opinion in the monitoring and evaluation section. There is also a good discussion of the subbasin plan's consistency with USFWS recovery plans for the bull trout, bald eagle and other birds, lynx, and wolf. Section 5.1 contains these.	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 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	**Research:** Does the RME section of the plan describe a research agenda with specific conditions and situations identified in the subbasin that will require specific research studies to help resolve management uncertainties? Is the research agenda framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties? Does the RME section prioritize research topics that are of critical importance to the subbasin?	*(Y)es, (P)artial, (N)o*	*Need for additional treatment (0-4)*
Reviewers: The planners identify three tiers of RME needs. They specifically identify overall research (Tier 3) needs for focal species. The RME needs for aquatic and terrestrial species are summarized in tables.		Yes	2
III.D.2	**Monitoring Objectives:** Does the RME subsection identify what kind of information needs to be collected in order to determine if the plan's vision and objectives are being met? I.e., what indicator variables will be monitored?		

Reviewers: The planners identify a course of "effectiveness" monitoring that includes indicators and appropriate variables. The plan's monitoring objectives are described in detail. The plan's operating assumptions are included. Prioritization is presented later in the monitoring and evaluation plan in detailed tables. It is not clear if these monitoring objectives are implementable because it is not certain if they provide a clear direction for what to do in sequence. The RME monitoring objectives section suffers from confused organization and needless repetition: The heading "Monitoring and Evaluation Objectives" follows the statements of those objectives (which are mislabeled as management objectives). Following the "M&E Objectives" heading is a long array of performance measures (Table 9). They are grouped into categories of (population) abundance, distribution, habitat, and the objectives to which they apply are merely listed by code. It would probably be more helpful to group the performance measures according to objective, with the objectives spelled out, as is done a few pages further on (perhaps relegating Table 9 to appendix status). The hypothesis under each of the (repeated) objectives is probably not needed and should be eliminated as clutter.		Partial	3
III.D.3	**Monitoring Indicators:** Does the RME subsection identify measurable indicators of physical, chemical, biological, or socioeconomic conditions that may act as environmental signposts by which progress towards achieving the stated vision can be evaluated? E.g., does the RME subsection describe performance standards or quantitative benchmarks for reference conditions against which observations can be compared? Does the plan prioritize which indicators are most needed to answer management questions (include a short list)?		
Reviewers: The plan describes "performance measures" in general terms for both aquatic and terrestrial species in Table 9. The table is a useful device for organizing monitoring needs. However, the table is not completely filled in and it presents a lengthy list. It is not clear how it will be prioritized.		Partial	2
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 an explicit discussion of the planner's intent to use protocols identified by PNAMP and to archive data and information collection.		Partial	2
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's coordination and implementation of the data collection regime will be accomplished through PNAMP. Their wildlife data collection and coordination protocol is still in development. It will be strategy focused. The plan discusses the need to coordinate with resource-based industries in the subbasin to promote effective implementation and avoid negative economic impacts.		Partial	2
III.D.6	**Summary Question. RME Logic Path (Evaluation and Adaptive Management):** Does the subbasin plan provide a scientifically supportable procedure for refining the biological objectives as new information becomes available about how fish, wildlife, and the environment interact, and in relationship to how the plans are implemented over time? (Council Question 7) Specifically, does the RME subsection describe a scientifically sound logic path for how to test if the subbasin plan's strategies are helping to reach the stated vision and objectives? I.e., Is the RME agenda adequately framed around the relationships between the assessment data and the stated vision, biological objectives, and strategies in describing uncertainties?		
Reviewers: The planners acknowledge that information is vital to adaptive refinement of their Management Plan over short and longer-term time frames. While the magnitude of their endeavor is large, it appears to follow a basic logic path from action to evaluation to adapting future management. The plan offers a connection to its Assessment, limiting factors and Inventory, although sometimes this is presented in seemingly contradictory ways. The planners address the monitoring associated with the NEOH Master Plan. Then they identify the elements in the plan that should be defined. More details need to be given on how they intend to do this. The plan's wildlife management and evaluation plan is not developed.		Partial	3
	Overall impression and evaluation of the Management Plan: As needed elaborate on your evaluation of the various Sections enumerated above. If the plan provides additional analysis beyond what is laid out above in the checklist please comment here (e.g., socio-economic descriptions or analysis).		
Reviewers: This Management Plan features an extensive coverage of the fish and wildlife problems to be addressed, although it needs to be more specific in its prioritization of strategies. The plan's aquatic RME section is organizationally confused, and it does not follow through into adaptive management except perhaps by vague implication in some places. The aquatic RME plan should be better organized and include empirical measures that can be used in adaptive management. The planners should pull out-of-subbasin effects into their RME plan. Also, the RME plan and the subbasin plan in general provide scant information about and analysis of exotic species. This is an important factor that should be further explored.		Partial	3

Overall, numerous areas of this plan need elaboration and clarification including prioritization issues, the consistency of objectives and strategies, data needs, and research on reach priorities.		

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

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

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

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

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

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

Reviewers: The diverse planning group appears to have captured much of the spirit and intent of the Council's Fish and Wildlife Plan. The plan contains various aspects that are in line with some of the Council's Eight principles. The Management Plan would be augmented by drawing explicit connection of its material to each of the eight principles. It could give attention to this in summary statements, particularly in a concluding section of the Management Plan. Overall, this plan offers inadequate consideration of the dynamic nature of ecosystems and the role of disturbance in shaping aquatic habitats. The plan does not identify the important ecological functions and processes that must be restored in the Imnaha subbasin. It is unclear how the plan will address natural variation both within and outside of the subbasin. The plan does not show how biodiversity will be protected and restored.	Partial	3