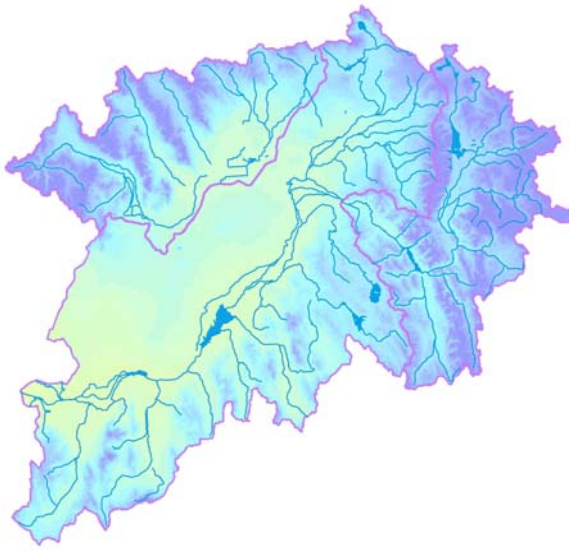
Draft Addendum to the Upper Snake Province Assessment

Submitted To

The Northwest Power and Conservation Council
Portland, Oregon



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Background

The Upper Snake Province (USP) Assessment was prepared for the Northwest Power and Conservation Council (NPCC) on May 28, 2004. The USP Assessment and Inventory are prepared as an integral part of the NPCC subbasin planning process in that they form the foundation for the Management Plan for the subbasin. For the Upper Snake River system, the development of an Assessment was challenging in that three subbasins were combined to form the USP Assessment – the Upper Snake, Snake Headwaters, and Upper Snake Closed Subbasin. The USP Assessment (May 2004), the Assessment Appendixes (May 2004), and the Draft USP (DUSP) Management Plan (May 2004) were developed and submitted together. However, as immediately identified within the DUSP Management Plan, the document was presented as a "foundation for a plan" and not a "finished product," primarily due to time constraints. Following the review of the Assessment and Management Plan, the Council and Independent Science Review Panel (ISRP) provided comments (Appendix A) on the Assessment, Inventory, and Management Plan and concluded that the products did "not provide a strongly focused basis for further planning."

The purpose of this USP Addendum to the USP Assessment is to address the primary concerns, or key issues, of the Council and others (Appendix B) that would support the adoption of the USP Management Plan, by the NPCC. The USP Addendum will focus specifically on the key items identified by the NPCC as necessary for the adoption of the Assessment to the NPCC program. These key items include:

1) An explanation of the choices for focal species

2) A reevaluation of the terrestrial portion of the species status and characterization

3) Clearly stated assumptions, judgments, working hypotheses, models, literature, etc. used to understand the relationship of the focal species to the environment and ecological processes

4) A synthesis of the Assessment that includes key findings and identification of those factors that limit the productivity of focal species

In addition, Tribal information that was not included the original Assessment (May 2004) and Appendixes (May 2004) will be included as an appendix to this Addendum (Appendix C).

Introduction

A review of the contents within the USP Assessment and its appendixes finds a valuable source of information that generally meets the criteria guidelines described within the *Technical Guide for Subbasin Planners* (NPPC 2001). However, the inability to complete the Assessment, as well as the organization of the Assessment, created difficulties in tracking the development of the selected focal species, focal habitats, and the factors that are limiting those species and habitats. This Addendum will focus on addressing the four key items described above by creating a summary linkage between these two documents, which will address the documented concerns. This will be accomplished through a focused cooperative and collaborative process that includes members of the original Assessment and Management Plan Team working on the specific items above, with the ultimate goal of incorporating this information in the redevelopment a USP Management Plan.

The strategy for addressing the key items within the Addendum involved assembling information from: 1) meeting notes from the original USP Technical Team meetings (September 2003 through March 2004; Appendix D); 2) the USP Assessment and Appendix (March 2004); and 3) the frequent meetings with the USP Addendum and Planning Team (October through December 2004).

The development of the Assessment (May 2004), Appendix (May 2004), and the Addendum stem from several sources: USP Technical Team USP knowledge, databases such as IBIS (2003) and GAP II (2003), and numerous published and unpublished documents. A complete list of the reference documents and databases used to analyze and examine conditions within the USP are included within Section 5 of the USP Assessment (May 2004). The Technical Team also recognizes that their examination of conditions such as focal habitats has been conducted on a large scale and may overestimate the size or location of particular habitat features. However, where available, the Technical Team used site- or watershed-specific information.

In this Assessment, the Technical Team assumes that each of the ecosystems, habitats, and species assessed originated and functioned optimally prior to anthropogenic influence. The technical Team suggests that increasing anthropogenic effects have exaggerated the limiting factors beyond the range of natural variability and that this pressure has simplified interactions and relationships and reduced the resilience of focal habitats and species, leading to long-term decline. However, the Technical Team also recognizes that, even in the presence of anthropogenically simplified environments, the relationships of ecosystems, habitats, and populations of fish, wildlife, and plants are very complex and that in most cases, these relationships are both undefined and interrelated. Further, the Team assumes that ongoing declines in focal habitats or species have unknown consequences at best and lead to extinction for one or more species at worst.

Focal Habitats and Species

The Technical Guide for Subbasin Planners (NPPC 2001) provides guidelines for the selection of focal species that are used to characterize the status of fish and wildlife species within the subbasin, or USP in this case. The selection of focal species within the USP requires an understanding of the population status, its distribution, and its life history needs as they are related to habitats. The selection of focal terrestrial habitats within the USP provides a broader, and perhaps better, context within which to measure the direct and indirect relationships of a select few focal species and their responses to management actions. The selection of focal species was made by the subbasin Technical Team that included a variety of Idaho and Wyoming State agencies as well as Federal agencies. Further, the selection of species was supported by published and unpublished reports described within the Assessment. The focal habitats selected within the USP were determined by the Technical Team from the categories developed in the Interactive Biodiversity Information Service (IBIS). Descriptions of the focal species and habitats selected by the subbasin teams, as well as the rationale for their selection are summarized in the following section:

Aquatic Focal Species

Focal species either have special ecological, cultural, or legal status, or can be used to evaluate the health of the ecosystem and effectiveness of management actions. The following selection criteria were used as a guide in the selection of focal species (NPPC 2001):

- Federal / State classification
- Cultural / economic significance
- Critical ecological function
- Indicator of environmental health
- Locally significant or rare
- Guild representative
- Habitat obligate
- Managed species
- Relationship to salmon
- Data availability

Members of the Technical Team selected Yellowstone cutthroat trout, mountain whitefish, bull trout, and two mollusks (Utah valvata and Snake River physa snail) as focal species for aquatic habitats within the Assessment. The rationale and role that the focal species play within the USP are described in Table 1.

TABLE 1
Basis for Selection of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
	Yellowstone cutthroat trout (*Oncorhynchus clarkii bouvieri*)	**Rationale for Selection** 1. The species was agreed upon by the USP Assessment Team. 2. The species is native and generally widespread throughout the USP. 3. It is a species about which much information is known. 4. Within Idaho, the species is ranked as imperiled (S2) because of rarity or other factors, making it vulnerable to extinction throughout its range. 5. It is a primary management species within portions of Idaho and Wyoming. 6. It is a popular game fish in portions of the USP. 7. Its decline in portions of the USP is of concern. 8. It is culturally significant to Shoshone-Bannock Tribe (SBT) as a native salmonid. **Ecological Significance** 1. It is a native coldwater species within the USP although stocked in portions of subbasins. 2. It is considered an aquatic indicator for the health of the ecosystem because of its life history requirements. 3. It is insectivorous throughout life turning to piscivory in larger fish. 4. It provides a food base for some birds and mammals.
Aquatic	Mountain whitefish (*Prosopium williamsoni*)	**Rationale for Selection** 1. The species was agreed upon by the USP Assessment Team. 2. The species is generally widespread throughout the USP. 3. It is a species about which much information is known, although abundance of information is lacking (data gap). 4. It can serve as an indicator within large streams and rivers. 5. It is a fall spawner and may serve as an indicator to associated seasonal flow modification. 6. It is culturally significant to the SBT as a native fish. **Ecological Significance** 1. It is a native coldwater species within the USP, and the only native salmonid to portions of the Upper Snake Closed Subbasin. 2. It is prey to piscivorous (fish eating) fishes like bull trout. 3. It is insectivorous primarily, exhibiting some degree of piscivory in larger fish.
	Bull trout (*Salvelinus confluentus*)	**Rationale for Selection** 1. The species was agreed upon by the USP Assessment Team. 2. The species is federally listed as threatened. 3. It is a native coldwater species, although restricted to portions of the Upper Snake Closed Subbasin. 4. The current species distribution is fairly well documented but limited to the Upper Snake Closed Subbasin. 5. It is culturally significant to SBT as a native salmonid. **Ecological Significance** 1. It is a top aquatic predator. 2. It has restrictive life history requirements generally requiring high-quality, cold water environments. 3. It is considered an aquatic indicator for the health of the ecosystem because of its life history requirements.

TABLE 1
Basis for Selection of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
	Mollusks: (Utah valvata (*Valvata utahensis*) and Snake River physa (*Physa natricina*)	**Rationale for Selection**
		1. It was agreed upon by the USP Assessment Team. 2. It is Federally listed as endangered. 3. It may serve as a good indicator for the impacts of bedload modifications from dam facilities in the mainstream Snake River. 4. It may serve as an indicator of the impacts from exotics (e.g., New Zealand Mud Snail). 5. Snake River physa are generally associated with the mainstem Snake River and may serve as an indicator for the deep water, large river habitats. 6. Utah valvata is generally associated with native macrophytes in mainstream lacustrine waters and may serve as an indicator for modifications within these habitats.
		Ecological Significance
		1. It is a native species of the mainstem Snake River. 2. They are native mollusk associates. 3. The Utah valvata is a spring complex and macrophyte associate. 4. The Snake River physa is a deep water gravel associate.

Terrestrial Focal Habitats and Species

Focal Habitats

The terrestrial resources section of the Addendum describes the physical and biological features of a focal habitat. Focal habitats describe a combination of unique vegetative characteristics, dominant plant species, or successional stages with important ecological ties to fish and wildlife (e.g., old growth). Focal habitats may also be composed of specific environmental elements integral to the viability of fish and wildlife populations (e.g., pools, larger woody debris, snags, and caves). The Technical Team used one or more of the following criteria to identify and select focal habitats and species in this Assessment:

- Comparatively high fish and / or wildlife species density
- Comparatively high fish and / or wildlife species diversity
- Important fish and / or wildlife species breeding habitat
- Important fish and / or wildlife species seasonal ranges
- Important fish and / or wildlife species population or habitat linkage areas
- Rareness
- High vulnerability to habitat alteration
- Unique or dependent species

Using the criteria as a starting point, the Technical Team's initial discussions were based primarily on a list of 24 habitat classifications derived from the IBIS database. Focal habitat discussions evolved over the course of four meetings as both upper and lower Technical Teams settled on habitat classification questions that incorporated multiple species benefits

as well as addressed high conservation priorities. The Terrestrial Assessment Team identified nine focal habitats for the USP. These focal habitats and the basis for their selection are presented on Table 2.

Focal Species

Focal species either have special ecological, cultural, or legal status, or can be used to evaluate the health of the ecosystem and effectiveness of management actions. The following selection criteria were used in the focal species identification:

- Federal / State classification
- Cultural / economic significance
- Critical ecological function
- Indicator of environmental health
- Locally significant or rare
- Guild representative
- Habitat obligate
- Managed species
- Relationship to salmon
- Data availability

Using the criteria as a starting point, the Technical Team selected 24 focal species to represent the nine focal habitats for the USP. Of these, five are plant species that are the key component of the focal habitat and 19 are wildlife species. The focal species, selected by the subbasin planning teams, the basis for their selection, and the ecological significance of each species are presented on Table 3.

TABLE 2
Basis for Selection of Focal Habitats (as indicated in the USP Assessment)

Focal Habitat	Rationale for Selection
Riparian/Wetland	1. By virtue of its high productivity, diversity, continuity, and critical contributions to both aquatic and upland ecosystems, riparian/herbaceous wetland habitat provides a rich and vital resource to the fish and wildlife resources in the USP (see Assessment Appendix 2-2 for Key Ecological Function (KEF) and Key Ecological Correlate (KEC) scores). 2. Riparian habitat forms natural corridors that are important travel routes between foraging areas, breeding areas, and seasonal ranges, and that provide protected dispersal routes for young. 3. Riparian/herbaceous wetlands are scarce throughout the USP, appearing only in fragmented allotments. 4. Each layer consists of unique habitat niches that together support a diversity of bird and mammal species. 5. Protecting riparian habitat may yield the greatest gains for fish and wildlife across the landscape while involving the least amount of area.

TABLE 2
Basis for Selection of Focal Habitats (as indicated in the USP Assessment)

Focal Habitat	Rationale for Selection
Open Water / Ponds / Impoundments	1. Open water habitat in the USP is characterized by high diversity of fish and wildlife species (see Assessment Appendix 2-2 for KEF scores). Water management practices affect a number of species (through botulism outbreaks and other problems). 2. Open water habitat in the USP is characterized by important fish and wildlife movement corridors. 3. Open water habitat in the USP is characterized by high vulnerability to habitat alteration. 4. Open water habitat in the USP is characterized by unique or dependent species. 5. Reservoir levels result in loss of shoreline habitat.
Pine/Fir Forests	1. Important components of mesic, old forest types are large snags and large trees for nesting habitat for habitat specialists. Large logs provide foraging and nesting habitat. Early seral forest that results from timber harvest is different from forest created by fire. 2. The majority of the xeric, old forest habitat in the USP is found in the uppermost and eastern portions of the USP and is significantly less in extent than it was before 1900. 3. Mountain mahogany has a limited distribution and is very vulnerable to habitat alteration. Mountain mahogany is being heavily degraded.
Juniper/ Mahogany	1. Juniper/mountain mahogany habitats are an integral component of wildlife seasonal ranges within the USP (see Assessment Appendix 2-2 for KEF scores). 2. Mountain mahogany has a limited distribution and is very vulnerable to habitat alteration. 3. Juniper / mountain mahogany habitats are scarce throughout the USP, appearing only in fragmented allotments. One-third of the Pacific Northwest mountain mahogany and juniper community types listed in the National Vegetation Classification are considered imperiled or critically imperiled. 4. Habitat development occurs at geologic time scales.
Whitebark Pine	1. Whitebark pine habitats provide important seasonal ranges and a high-value seed crop for wildlife. 2. Whitebark pine habitats are scarce throughout the USP, appearing only in fragmented allotments. 3. Whitebark pine cannot maintain its functional role in mountain ecosystems unless areas suitable for its regeneration are available across the landscape. An exotic fungus, white-pine blister rust, has killed many whitebark pine trees in the moister parts of its range. 4. Whitebark pine habitats have fire-dependent ecological characteristics with several obligate or near obligate wildlife species. 5. Whitebark pine is also a culturally significant source of food for Native Americans.
Aspen	1. Aspen's importance to many wildlife species make these forests a significant biotic community in the USP (see Assessment Appendix 2-2 for KEF scores). 2. Aspen's importance to many wildlife species make these forests a significant biotic community in the USP. Because aspen stands are so different from conifer stands, they are very important for landscape diversity and wildlife habitat. 3. Current records of habitats suggest that aspen forests have declined and become fragmented from historic times and appear to have almost disappeared or been replaced with old, dry pine/fir forests. Aspen stands are in decline across the West.
Mountain Brush	1. Mountain brush is widely regarded as important to wildlife for its food and cover values, as well as important for providing integral components of watershed stability and species diversity. 2. This habitat is important for big game (winter range), bears, upland game birds, and neotropical migrants. 3. Mountain brush habitats are scarce throughout the USP, appearing only in fragmented allotments. Mountain brush is one of the habitats most imperiled by people building and maintaining summer cabins.

TABLE 2
Basis for Selection of Focal Habitats (as indicated in the USP Assessment)

Focal Habitat	Rationale for Selection
Shrub-Steppe	1. Sagebrush and the native perennial grasses and forbs of the shrub-steppe are important sources of food and cover for wildlife (see Assessment Appendix 2-2 for KEF scores). 2. Comparatively high wildlife density and species diversity characterize shrub-steppe habitat. 3. This habitat provides important wildlife breeding habitat and seasonal ranges. 4. Loss of the abundance and vigor of bunchgrasses triggers the unraveling decay of watershed integrity and the capability of these sites to produce wildlife habitat and commercial resource values. 5. Approximately 100 bird and 70 mammal species can be found in sagebrush habitats. Some of these species are sagebrush obligates or near obligates. 6. Researchers suggest that shrub-steppe habitat be given the highest conservation priority based on trends in bird populations. Shrub-steppe is the focus of BLM efforts to recover what has been burned and lost (for the benefit of sage-grouse).

TABLE 3
Basis for Selection and Ecological Significance of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
Riparian/ Wetland	Western toad (*Bufo boreas boreas*)	**Rationale for Selection** 1. The western toad is an indicator of the health of the riparian/herbaceous wetland habitats, primarily because it feeds in water on decomposing benthic substrate and aids in physical transfer of substances for nutrient cycling. **Ecological Significance** 1. It feeds in water on decomposing benthic substrate and aids in physical transfer of substances for nutrient cycling. 2. It uses burrows dug by other species (secondary burrow user). 3. It physically affects (improves) soil structure and aeration (typically by digging). 4. It has a high total count for KEF and KEC score (see Assessment Appendix 2-2).
	Yellow-billed cuckoo (*Coccyzus americanus*)	**Rationale for Selection** 1. It is a candidate ESA species. 2. The yellow-billed cuckoo acts as an indicator species for riparian habitat quality because it eats insects in the riparian vegetation. **Ecological Significance** 1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It is an interspecies nest parasite. 3. It controls or depresses insect population peaks.
	American beaver (*Castor canadensis*)	**Rationale for Selection** 1. Waterfowl often benefit from the increased edge, diversity, and invertebrate communities created by beaver activity. Also, beaver ponds provide habitat for invertebrate populations, which are prey for amphibians, birds, and fish.

TABLE 3
Basis for Selection and Ecological Significance of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
		Ecological Significance
		1. It is prey for primary or secondary predators. It is a primary burrow excavator (fossorial or underground burrows). 2. It creates trails (possibly used by other species). 3. It aids in physical transfer of substances for nutrient cycling (carbon, nitrogen, phosphorus, etc.). 4. It physically affects (improves) soil structure and aeration (typically by digging). 5. It impounds water by creating diversions or dams; creates ponds or wetlands by building physical barriers. 6. It creates standing dead trees (snags). 7. It has a high total count for KEF and KEC score and is a critical functional link species for several habitats (see Assessment Appendix 2-2).
Open Water / Ponds / Impoundments	Trumpeter swan (*Cygnus buccinator*)	**Rationale for Selection**
		1. The trumpeter swan is categorized as a species of special concern in Idaho and Montana and as a priority 1 species in Wyoming. It is critically imperiled because of extreme rarity. 2. Trumpeter swans are also sensitive to human activities on their breeding grounds. Intrusions by humans at nesting wetlands have caused temporary and permanent nest abandonment, as well as movements from breeding and staging areas.
		Ecological Significance
		1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It is a primary creator of ground structures (possibly used by other organisms).
	Western grebe (*Aechmophorus occidentalis*)	**Rationale for Selection**
		1. Open water habitats that support populations of grebes, loons, or white pelicans most likely have high water quality and support healthy fish populations because all three of these focal species consume great amounts of fish.
		Ecological Significance
		1. It disperses vascular plants, insects, and other invertebrates. 2. It is a primary creator of aquatic structures (possibly used by other organisms).
	American white pelican (*Pelecanu erythrorhynchos*)	**Rationale for Selection**
		1. It is critically imperiled because of extreme rarity. 2. Open water habitats that support populations of grebes, loons, or white pelicans most likely have high water quality and support healthy fish populations because all three of these focal species consume a lot of fish.
		Ecological Significance
		1. It is piscivorous. 2. It is a primary creator of aerial structures (possibly used by other organisms).
	American avocet (*Recurvirostra americana*)	**Rationale for Selection**
		1. Because the avocet eats mostly aquatic invertebrates, this species is also an indictor of open water habitat quality.
		Ecological Significance
		1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It disperses insects and other invertebrates.

TABLE 3
Basis for Selection and Ecological Significance of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
Open Water / Ponds / Impoundments (continued)	Common loon (*Gavia immer*)	**Rationale for Selection** 1. It is critically imperiled because of extreme rarity in Idaho and sensitive species. 2. Open water habitats that support populations of grebes, loons, or white pelicans most likely have high water quality and support healthy fish populations because all three of these focal species consume a lot of fish. **Ecological Significance** 1. It is piscivorous. 2. It disperses vascular plants, insects, and other invertebrates.
Pine/Fir Forests	Great gray owl (*Strix nebulosa*)	**Rationale for Selection** 1. It is a protected non-game species in Idaho. 2. It is imperiled because of rarity in Idaho. **Ecological Significance** 1. It uses aerial structures created by other species. 2. It controls terrestrial vertebrate populations (through predation).
	Black-backed woodpecker (*Picoides arcticus*)	**Rationale for Selection** 1. The woodpecker is designated as a species of special concern in Idaho. 2. It is a protected non-game species in Idaho. **Ecological Significance** 1. It is a primary cavity excavator in snags or live trees. 2. It controls or depresses insect population peaks. 3. It physically fragments downed, standing wood.
	Boreal owl (*Aegolius funereus*)	**Rationale for Selection** 1. It is a protected non-game species in Idaho. 2. It is imperiled because of rarity in the Idaho. **Ecological Significance** 1. It is a vertebrate eater (consumer or predator of herbivorous vertebrates). 2. It is a secondary cavity user.
	Northern goshawk (*Accipiter gentillis*)	**Rationale for Selection** 1. It is not rare and apparently secure, but with cause for long-term concern. **Ecological Significance** 1. It controls terrestrial vertebrate populations (through predation or displacement). 2. It is a primary creator of aerial structures (possibly used by other organisms).
Juniper/ Mahogany	Mountain mahogany (*Cercocarpus ledifolius*)	**Rationale for Selection** 1. Juniper/mountain mahogany habitats are an integral component of wildlife seasonal ranges within the USP. 2. Mountain mahogany has a limited distribution and is very vulnerable to habitat alteration. Juniper / mountain mahogany habitats are scarce throughout the USP, appearing only in fragmented allotments. 3. One-third of the Pacific Northwest mountain mahogany and juniper community types listed in the National Vegetation Classification are considered imperiled or critically imperiled. 4. Juniper/Mahogany is culturally significant to the SBT.

TABLE 3
Basis for Selection and Ecological Significance of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
		Ecological Significance
		1. It provides big game cover and forage, especially during winter. 2. It is very palatable to bighorn sheep. 3. It has some stabilization properties; helps to stabilize soil in disturbed areas such as road cuts and mine spoils. 4. It is tolerant of heat and drought.
White-bark Pine	Whitebark pine (*Pinus albicaulis*)	**Rationale for Selection**
		1. It is a culturally significant source of food (pine nuts) for Native Americans. 2. Its habitats provide important seasonal ranges and a high-value seed crop for wildlife. 3. Its habitats are scarce throughout the USP, appearing only in fragmented allotments. 4. It is being impacted by white-pine blister rust, which was introduced from Europe at the turn of the twentieth century. The spread of white-pine blister rust spread has been exacerbated by fire suppression. 5. Its habitats have fire-dependent ecological characteristics with several obligate or near obligate wildlife species. 6. It cannot maintain its functional role in mountain ecosystems unless areas suitable for its regeneration are available across the landscape.
		Ecological Significance
		1. It provides forage for bears and other species. 2. It survives where tree growth is limited. 3. It provides hiding and thermal cover for wildlife.
	Clark's nutcracker (*Nucifraga columbiana*)	**Rationale for Selection**
		1. It is a protected non-game species. 2. It is a keystone species in whitebark pine regeneration.
		Ecological Significance
		1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It disperses seeds/fruits (through ingestion or caching).
Aspen	Quaking aspen (*Populus tremuloides*)	**Rationale for Selection**
		1. Aspen's importance to many wildlife species make these forests a significant biotic community in the USP. Because aspen stands are so different from conifer stands, they are very important for landscape diversity and wildlife habitat. 2. Current records of habitats suggest that aspen forests have declined and become fragmented from historic times and appear to have almost disappeared or been replaced with old, dry pine/fir forests. 3. Aspen stands are in decline across the West.
		Ecological Significance
		1. It provides important breeding/nesting, foraging, cover, and resting habitat for a variety of birds and mammals. 2. It has a high food value. It is important for certain cavity nesters and mid-seral species.
Mountain Brush	Antelope bitterbrush (*Purshia tridentata*)	**Rationale for Selection**
		1. Pronghorn, mule deer, elk, bighorn sheep, and moose utilize antelope bitterbrush extensively. Ungulates, birds, and rodents also use antelope bitterbrush for cover. 2. It is a native, deciduous shrub and is important browse for wildlife and livestock.

TABLE 3
Basis for Selection and Ecological Significance of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
		Ecological Significance
		1. It is an important browse for wildlife and livestock. 2. It supports several insect populations. 3. It provides cover for birds and rodents.
	Green-tailed towhee (*Pipilo chlorurus*)	**Ecological Significance**
		1. It is prey for secondary or tertiary consumers (primary or secondary predator).
	Mule deer (*Odocoileus hemionus*)	**Rationale for Selection**
		1. It is a game species in Idaho.
		Ecological Significance
		1. It is an herbivore on trees, shrubs, grasses, and forbs that may alter vegetation structure and composition. 2. It is a major prey species for carnivores. 3. It creates trails (possibly used by other species) and uses trails created by other species.
Mountain Brush (continued)	Rocky Mountain elk (*Cervus elaphus nelsoni*)	**Rationale for Selection**
		1. It is a game species in Idaho.
		Ecological Significance
		1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It is an herbivore on trees or shrubs that may alter vegetation structure and composition. 3. It aids in transportation of viable seeds, spores, plants, or animals. 4. It disperses fungi. 5. It physically fragments downed wood. 6. It creates trails (possibly used by other species) and uses trails created by other species.
Shrub-Steppe	Sagebrush (*Artemisia* spp.)	**Rationale for Selection**
		1. Wyoming big sagebrush is preferred browse for wild ungulates and Wyoming big sagebrush communities are important winter ranges for big game. 2. Different species of sagebrush provide food, cover, and nesting substrate, especially for sage-steppe obligates such as the greater sage-grouse during winter months. 3. Approximately 100 bird and 70 mammal species can be found in sagebrush habitats. Some of these species are sagebrush obligates or near obligates. 4. Researchers suggest that shrub-steppe habitat be given the highest conservation priority based on trends in bird populations. 5. Sagebrush is culturally significant to the SBT.
		Ecological Significance
		1. It provides food, cover, and nesting substrate, especially for sage-steppe obligates. 2. It sometimes protects other native forbs and grasses from overgrazing (when in the interface). 3. It determines which other kinds of vegetation will occur. 4. It stabilizes soil; tolerates drought.

TABLE 3
Basis for Selection and Ecological Significance of Focal Species (as indicated in the USP Assessment)

Focal Habitat	Focal Species	
	Northern sagebrush lizard (*Sceloporus graciosus graciosus*)	**Rationale for Selection** 1. It is a protected non-game species in Idaho. **Ecological Significance** 1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It physically affects (improves) soil structure and aeration (typically by digging).
Shrub-Steppe (continued)	Greater sage-grouse (*Centrocercus urophasianus*)	**Rationale for Selection** 1. It is a game species in Idaho. **Ecological Significance** 1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It disperses seeds.
	Sage sparrow (*Amphispiza belli*)	**Rationale for Selection** 1. It is not rare and apparently secure but with cause for long-term concern. **Ecological Significance** 1. It is prey for secondary or tertiary consumers (primary or secondary predator). 2. It is a common interspecific nest host. 3. It disperses seeds/fruits (through ingestion or caching).

Re-evaluation of the Terrestrial Portion of the Species Status and Characterization

The Terrestrial Assessment Team for the USP identified nine focal habitats and 24 focal species (Table 3) for the Assessment (May 2004). The selection of these habitats (Table 3) was aided by the descriptions of the habitat types within the IBIS that best represented the primary or regionally important habitats within the USP, according to the Terrestrial Assessment Team. Further, the selection of focal species was based on the knowledge of the close relationships, or dependence, that the selected focal species (Table 3) play within those focal habitats (Appendix May 2004).

In evaluating the status and characterization of the Assessment and Appendix (May 2004), it is presumed, though not specifically stated, that the success of future projects or management actions would be judged by monitoring changes in focal habitats (distribution, quality, and extent) and on focal species (habitat occupancy and abundance). However, the relationships between habitats and species are complicated (Appendix 2004) and the use of one (i.e., focal habitats or focal species) alone may not reflect the benefit of a project or management action to that habitat or even the species. For example, there are several problems with trying to measure the success of an action using focal species as a direct metric. Developing new habitat or improving existing habitat does not assure that a given species will use it for any portion of its life history. This is particularly true for relatively rare species such as trumpeter swans or yellow-billed cuckoos. If the measure of an action's success is the wildlife species' response to that action and the species is not found to occupy the restored suitable habitat, the project may be considered to be a failure based on this lone

metric. This is in spite of the fact that the project may have achieved its habitat goals and the new or improved habitat may be perfectly suitable for the species.

There are many factors that affect the abundance of terrestrial species at any point in time besides habitat quality. These include habitat quantity, juxtaposition or fragmentation, life history uses within a habitat type, short- and mid-term weather, seasonal behavior responses, competition for resources with other species including domestic livestock, and conditions within and among the ranges of migrating birds or mammals. If species occurrence or abundance is the only metric used to measure the success of an action, it is virtually impossible to isolate the effects of the action on species occurrence or abundance from the effects of all of the other factors that affect the species. Thus, understanding the potentially complex relationships of the focal species behavior in relation to its habitat is important in assessing the response.

Another approach to assessing beneficial project effects on wildlife is to determine and measure important aspects of the habitat requirements for focal species representing each focal habitat. That is, each focal species requires a particular set of habitats and time spent at these habitats that combine to represent its “home range”. Projects and management actions that consider a focal species relative to its home range within a focal habitat may provide a useful approach in measuring the response of projects and management actions on a focal species as well as its focal habitat. Using this approach, one would measure changes in the quality and quantity of specific habitat parameters (Appendix May 2004) judged to be important for focal wildlife species that use their associated focal habitats. Changes in habitat quality (or quantity) would be a metric used to measure the success of an action. For focal habitats of limited and declining occurrence, such as whitebark pine or aspen, metrics may involve successful reproduction or expansion of the range of the community type rather than metrics tied specifically to a wildlife species. However, combining a long-term evaluation of focal species use within these habitats should be combined in an evaluation of a project or action.

Measuring the response of habitat (i.e., vegetation) is often easier than those of species responses for several reasons. Habitats respond directly to management actions rather than the potential, and more complicated, indirect response of wildlife to habitat change. There are fewer uncontrolled variables that affect habitat condition than the number of variables that affect wildlife occurrence or abundance. Management actions often focus on habitat rather than directly on wildlife because of the decreased expenses of evaluating and tracking habitat parameters. Management actions and monitoring should focus on developing and measuring progress toward desired future habitat conditions as well as focal species distribution and abundance.

An approach that evaluates habitat quality, quantity, and trend and incorporates species responses should be combined and incorporated into habitat evaluation methods such as the Habitat Evaluation Procedure (HEP) method developed by the U. S. Fish and Wildlife Service (USFWS).

Interpretation and Synthesis of Findings

Key Findings for Focal Species and Focal Habitats

Current and historic land-use activities and land and species management strategies have led to the decline in focal habitats and species within the USP. A synthesis of the key findings from the USP analysis and examination and their related limitations are included in Tables 4 through 7. This list of findings is described at both the USP and subbasin levels. The findings generally address focal habitats even though most of the identified habitats contain associated focal species. The relationships between focal species and their habitats are well described within the USP Assessment (May 2004) and it is assumed that the negative impacts to the habitats described in the tables will also negatively affect the native focal species associated with these habitats.

TABLE 4
Key Findings of the USP

Area of Impact	Key Finding and Limitations
USP	Approximately 25 percent of the USP is highly impacted by the altered hydrologic regime (Assessment Appendix 3-1). Hydrologic modification includes the capture, control, storage, and diversion of water. These modifications are in place to support drinking water supplies, hydropower, irrigation, flood control, manufacturing uses, and recreation within the USP. However, the altered flow conditions have had varying effects on aquatic focal species, riparian and wetland habitats, and their associated focal species. More than 19,000 points of water diversion (Assessment Appendix 1-4) are present within the USP with a majority of the diversions occurring within the Big Lost, Portneuf, Teton, and Raft watersheds. The construction of dams and diversions has: 1) altered the natural hydrograph; 2) created barriers to fish passage (suppressing migratory Yellowstone cutthroat trout); 3) removed connectivity between aquatic focal populations; 4) affected water qualities both upstream and downstream of dam and diversion structures; 5) modified water quantities and timing; and 6) affected flow-dependent plant species. Stream and river channelization is undertaken for the purposes of flood control, navigation, drainage improvements, and a reduction of channel migration. The impacts of channelization result in unnatural, homogeneous-shaped channels, steeper stream gradients, altered stream flows, and reductions in average pool depths. Within the USP, the magnitude of the modification is estimated by the number of stream alteration permits issued by State and Federal agencies. More than 2,500 permits to alter stream channels have been issued within the USP, however the extent of the actions is difficult to ascertain at this scale due to the wide ranging types of activities. Water-quality-limited streams within the USP are extensive and widespread across the USP (Assessment Appendix 1-5). More than 1,900 miles of streams, lakes, and reservoirs within the USP are listed for water quality contaminants (including temperature), flow alterations, and habitat alterations. Hybridization of Yellowstone cutthroat trout and rainbow trout are found across the USP, although pockets of pure strains of Yellowstone cutthroat trout remain. The remaining pure strains of Yellowstone cutthroat trout continue to be suppressed by the distribution of non-native rainbow trout within the USP and the distribution of rainbow trout should be considered in fish passage restoration projects. Aquatic focal species recruitment may be suppressed within portions of the USP but data limitations prevent understanding the degree and distribution of the problem. Invasive plant species found across the USP (Assessment Appendix 1-6) have in the past, and are currently, affecting the ecological function of all focal habitats.

TABLE 4
Key Findings of the USP

Area of Impact	Key Finding and Limitations
	An altered fire regime is likely the most significant ecological influence affecting ecosystem structure and function in the USP (Assessment Appendix 3-1). The altered fire regime has likely influenced all focal habitats and species to some degree and some of these influences are only recently being realized (for example the effects of fire on nutrient cycling in aquatic systems).
	Significant portions of aspen habitats have been lost due to altered and suppressed fire regimes, and the encroachment of shade-tolerant species, insects, and disease.
	The conversion and development of lands within the USP has resulted in the loss of riparian and wetland areas (Assessment Appendix 3-1 Table 6).
	The development of lands within the USP has created fragmented habitats and associated biotic and abiotic effects (Assessment Appendix 3-1 Table 7).
	Road and trail densities, distributions, and locations affect focal habitats and associated species throughout the USP (Assessment Appendix 3-1 Figure 9).
	Impacts from motorized recreation activities on public lands are damaging riparian and wetland areas within portions of the USP.
	Grazing activities continue to impact riparian, wetland, and spring habitats within portions of the USP.
	Open water ponds, impoundment habitats, and associated focal species are suppressed from the modification of the hydrologic regime and reservoir management.
	Waterfowl populations are being impacted by human disturbances to critical nesting and brooding habitats within portions of the USP.
	Past forest management practices have resulted in the loss of late-seral pine and fir forest stands, increases in insect and disease impacts, and fragmented stands. These conditions differ from the historic conditions (Assessment Appendix 3-1) through much of the USP and the impacts to focal species and habitat are not fully understood.
	Whitebark pine stands represent only a fragment of their historic distribution within the USP and throughout their range, and natural regeneration appears to be nearly lost due primarily, to fire suppression and secondarily, to white-pine blister rust. Although the whitebark pine represent a very small portion of the USP vegetation type, the species provides an important seed source for many mammals and birds as well as serving a significant cultural aspect to Native Americans.
	The shrub-steppe habitat is one of the most widely distributed vegetation types within the USP (Assessment 2.3.3). There are several sagebrush obligate species whose habitats have been affected by invasive plant species, and the development, conversion, and fragmentation of the shrub-steppe habitats.

TABLE 5
Key Findings of the Snake Headwaters Subbasin

Area of Impact	Key Finding and Limitations
Snake Headwaters Subbasin	Inundation of the Snake River by the construction of Palisades Dam resulted in impacts to wildlife, including 37,070 habitat units (HUs) of target species habitats (bald eagle, mule deer, elk, mallard, Canada goose, mink, yellow warbler, black-capped chickadee, ruffed grouse, and peregrine falcon). Mitigation for this impact has yet to be completed.
	Approximately 346 hectares (3.46 km^2) of free-flowing river habitat was inundated by construction of Palisades Dam and Reservoir, resulting in the loss of an estimated 70,000 Yellowstone cutthroat trout and 200,000 mountain whitefish yearly since 1957 (see Appendix 4-2 regarding loss assessment).
	Migratory (fluvial/adfluvial) Yellowstone cutthroat trout populations are present in good numbers in the mainstream Snake River in the Snake Headwaters Subbasin. These populations are relatively unique in the USP.
	Impacts to migratory Yellowstone cutthroat trout by construction of Palisades and Jackson dams are unknown.
	Downstream of Palisades Dam, rainbow trout are a major threat to the long-term persistence of Yellowstone cutthroat trout.
	Levy construction along the main Snake River downstream of Jackson Lake Dam has altered the hydrologic regimes (by preventing flushing flows) in important Yellowstone cutthroat trout spawning streams, requiring active human intervention to maintain suitable spawning gravels.
	Levy construction along the main Snake River downstream of Jackson Lake Dam prevents water from overtopping banks, impacting cottonwood forest (riparian) habitat by preventing cottonwood regeneration.
	Pine/fir forest habitats in the Snake Headwaters Subbasin have greatly altered structure and function due to the effects of an altered fire regime.
	Invasive plant species with negative impacts to biodiversity, forage, habitat, aesthetic quality, soil productivity, and biodiversity have impacted all habitats in the Snake Headwaters Subbasin.
	Approximately 95 percent of all whitebark pine habitats in the Snake Headwaters Subbasin have been lost due to the exotic blister rust fungus and effects of an altered fire regime.
	Legacy timber-harvest activities have impacted significant amounts of forested habitat primarily within the Salt watershed.
	Grazing/browsing activities by livestock in the Greys-Hoback and Gros Ventre watersheds have impacted plant species composition, diversity, and density; disrupted ecosystem functioning; and altered forest dynamics.
	Development and other land-use practices have fragmented habitats in the Greys-Hoback watershed, principally in the vicinity of the rapidly growing community of Jackson.
	Approximately 99 percent of the mountain mahogany habitat in the Greys-Hoback watershed has been lost due to the effects of an altered fire regime.

TABLE 6
Key Findings of the Upper Snake Subbasin

Area of Impact	Key Finding and Limitations
Upper Snake Subbasin	Inundation of the Snake River by construction of Minidoka Dam resulted in impacts to wildlife, including 2,993 river otter HUs in riparian /river habitat, 3,755 greater sage-grouse HUs in shrub-steppe (sagebrush-grassland) habitat, 3,413 mule deer HUs in shrub-steppe habitat, and 342 yellow warbler HUs in deciduous scrub-shrub wetland habitat. Mitigation for this impact has yet to be completed.
	Based on preliminary estimates, approximately 1,385 hectares (13.9 km^2) of free-flowing river habitat was inundated by construction of Minidoka Dam and Lake Walcott, resulting in a loss of approximately 550 Yellowstone cutthroat trout and 995,000 mountain whitefish yearly since 1906 (see Appendix 4-2 regarding loss assessment).
	Strong populations of resident life history type Yellowstone cutthroat trout are present throughout the Upper Snake Subbasin.
	Migratory (fluvial/adfluvial) populations of Yellowstone cutthroat trout are present in Henry's Lake, Willow Creek, Blackfoot River, and Teton River, but they are depressed throughout most of the subbasin.
	All watersheds except Lake Walcott have documented core or conservation status Yellowstone cutthroat trout populations.
	Historic Yellowstone cutthroat trout habitat, especially large river habitat, has become dominated by rainbow trout throughout most of the Upper Snake Subbasin.
	Dewatering has isolated many of the Yellowstone cutthroat trout populations located in tributary habitats.
	Very little is known about the current or historic distributions of the Snake River physa and Utah valvata, two species of ESA-listed snails existing in the Upper Snake Subbasin.
	Listed snail species are thought of as riparian associates and, therefore, influenced by management of riparian zones.
	Water management has substantially altered the Snake River, changing it from a free-flowing coldwater system to a slower-moving warm water system based on an anthropogenic hydrologic cycle.
	Tributary habitat quality for Yellowstone cutthroat trout has been reduced by dewatering, land uses that have altered riparian habitat, and increased sedimentation in the Upper Snake Subbasin.
	To protect the genetic diversity of Yellowstone cutthroat trout in the Upper Snake Subbasin, it is necessary to conserve populations within each watershed.
	Shrub-steppe habitat structure and function has been greatly altered by recent fire history, invasive plant species, and large-scale conversion to dryland and irrigated agriculture.
	Shrub-steppe habitat quantity and quality have been impacted by the encroachment of western juniper due to an altered fire regime in portions of the subbasin.
	Open water habitat quantity and quality are affected by water-level fluctuations resulting from multiple anthropogenic uses of water resources.
	Pine/fir forest habitats in the Upper Henry's, Lower Henry's, and Teton watersheds have greatly altered structure and function due to the effects of an altered fire regime.
	Approximately 60 percent of the aspen habitats in the subbasin have been lost due to the effects of an altered fire regime.

TABLE 6
Key Findings of the Upper Snake Subbasin

Area of Impact	Key Finding and Limitations
	Approximately 50 percent of the mountain mahogany habitats in the subbasin have been lost due to the effects of an altered fire regime.
	Development, habitat conversion, and other land-use practices have fragmented habitats in all but the remotest areas of the subbasin. The central Snake River Plain is the area most severely impacted by these sources of disturbance.
	Numerous water diversion structures in the subbasin have altered hydrologic processes, with significant impacts to terrestrial and aquatic resources.
	Altered hydrologic processes have had significant impacts on riparian and herbaceous wetland habitat quantity, quality, structure, and function.
	Grazing/browsing activities by livestock in the subbasin have impacted plant species composition, diversity, and density, and they have disrupted ecosystem functioning.

TABLE 7
Key Findings of the Upper Snake Closed Subbasin

Area of Impact	Key Finding and Limitations
Closed Basin Subbasin	Substantial declines in mountain whitefish distribution and abundance have occurred in the Big Lost River in the last 20 years.
	Mountain whitefish declines in the Big Lost River appear to be related to altered discharge from Mackay Dam and dewatering throughout the system.
	Migratory populations of bull trout in the Little Lost watershed are depressed, and most bull trout populations are now made up of residents.
	Core and conservation Yellowstone cutthroat trout populations are present in the Beaver–Camas and Medicine Lodge watersheds.
	Hybrid (Yellowstone cutthroat trout × rainbow trout) and rainbow trout are present in the Medicine Lodge watershed close to core and conservation Yellowstone cutthroat trout populations.
	Habitat quality for fish focal species has been reduced by dewatering, land use that has altered riparian habitat, and increased sedimentation in the Upper Snake Closed Subbasin.
	Approximately 65 percent of the aspen habitats in the subbasin have been lost due to the effects of an altered fire regime.
	Shrub-steppe habitat quantity and quality have been impacted by the encroachment of western juniper due to an altered fire regime in portions of the subbasin.
	Approximately 96 percent of the mountain mahogany habitats in the subbasin have been lost due to the effects of an altered fire regime.
	Approximately, 56 percent of all whitebark pine habitats in the subbasin have been lost due to the white-pine blister rust fungus and the effects of an altered fire regime.
	Altered hydrologic processes have had significant impacts to riparian and herbaceous wetland habitat quantity, quality, structure, and function, primarily in the Beaver-Camas and Medicine Lodge watersheds.

TABLE 7
Key Findings of the Upper Snake Closed Subbasin

Area of Impact	Key Finding and Limitations
	Numerous water diversion structures in the subbasin have altered hydrologic processes, with important ramifications for terrestrial and aquatic resources.
	Legacy timber-harvest activities have impacted forested habitats, primarily within the Big Lost and Beaver-Camas watersheds.
	Grazing/browsing activities by livestock in the subbasin have impacted plant species composition, diversity, and density, and have disrupted ecosystem functioning.

Revised Section 1.7.1 – Water Quality

In the USP, there are 162 water bodies totaling 1,802 miles (2,900 km) of stream are classified as impaired under the guidelines of Section 303(d) of the Clean Water Act (USEPA 2001; IDEQ 2003). The primary limiting factors on water quality include sediments (62 percent), elevated temperature (38 percent), and nutrients (26 percent).

The streams on Idaho's 1998 303(d) list are presented in Figure 1. This list does not include EPA's 2001 additions to the list, which were primarily temperature-related. These additions are presented in Figure 2.[1] Table 8 presents a complete list of the most recently approved 303(d) list. This list is an update to Appendix 1-5 of the Assessment.

Figures 1 and 2 illustrate that some watersheds have a relatively greater distribution of water quality-impaired streams. The Upper Snake subbasin has 118 water quality-limited streams totaling 1,419 stream miles (2,284 km); this represents approximately 22 percent of all streams in the subbasin (see Table 8). The Closed Basin subbasin has 39 water quality-limited streams totaling 336 stream miles (541 km); this represents approximately 10 percent of all streams in the subbasin (see Table 8). Finally, the Snake Headwaters subbasin has 5 water quality-limited streams totaling 47 stream miles (76 km); this represents approximately 2 percent of all streams in the subbasin (see Table 8).

Once a water body is placed on the 303(d) list as being water quality impaired, a Total Maximum Daily Load (TMDL) is generally required to assess and mitigate the impairment. A summary of TMDLs that have been prepared and approved for watersheds in the Upper Snake province is provided in Table 9. TMDLs are scheduled for completion between 2004 and 2007 for the remaining watersheds, as specified in the 2002 Settlement Agreement.

[1] Neither of these figures represents the current status that reflects the 2002 Settlement Agreement, which removed some previously-listed segments from the 303(d) list.

FIGURE 1
Water quality limited (Section 303[d]) streams in the Upper Snake province – IDEQ 2003

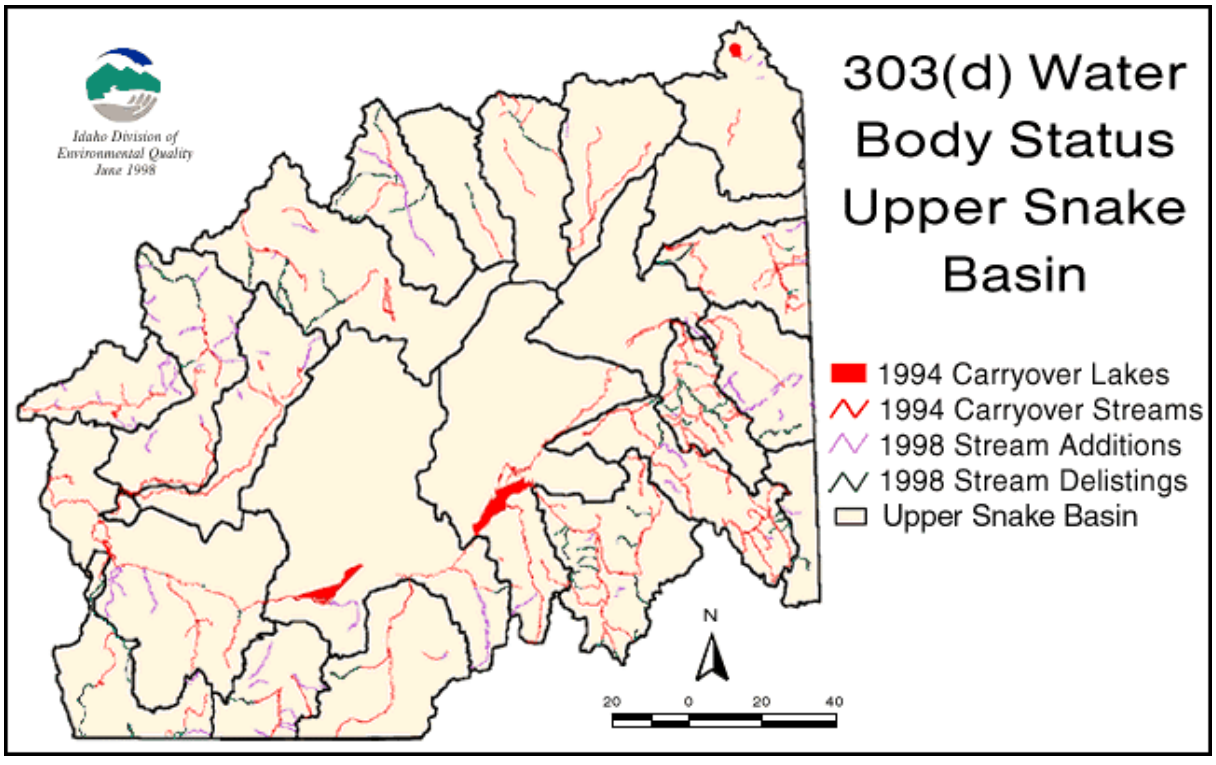

FIGURE 2
Water quality limited (Section 303[d]) streams in the Upper Snake province – EPA 2001.

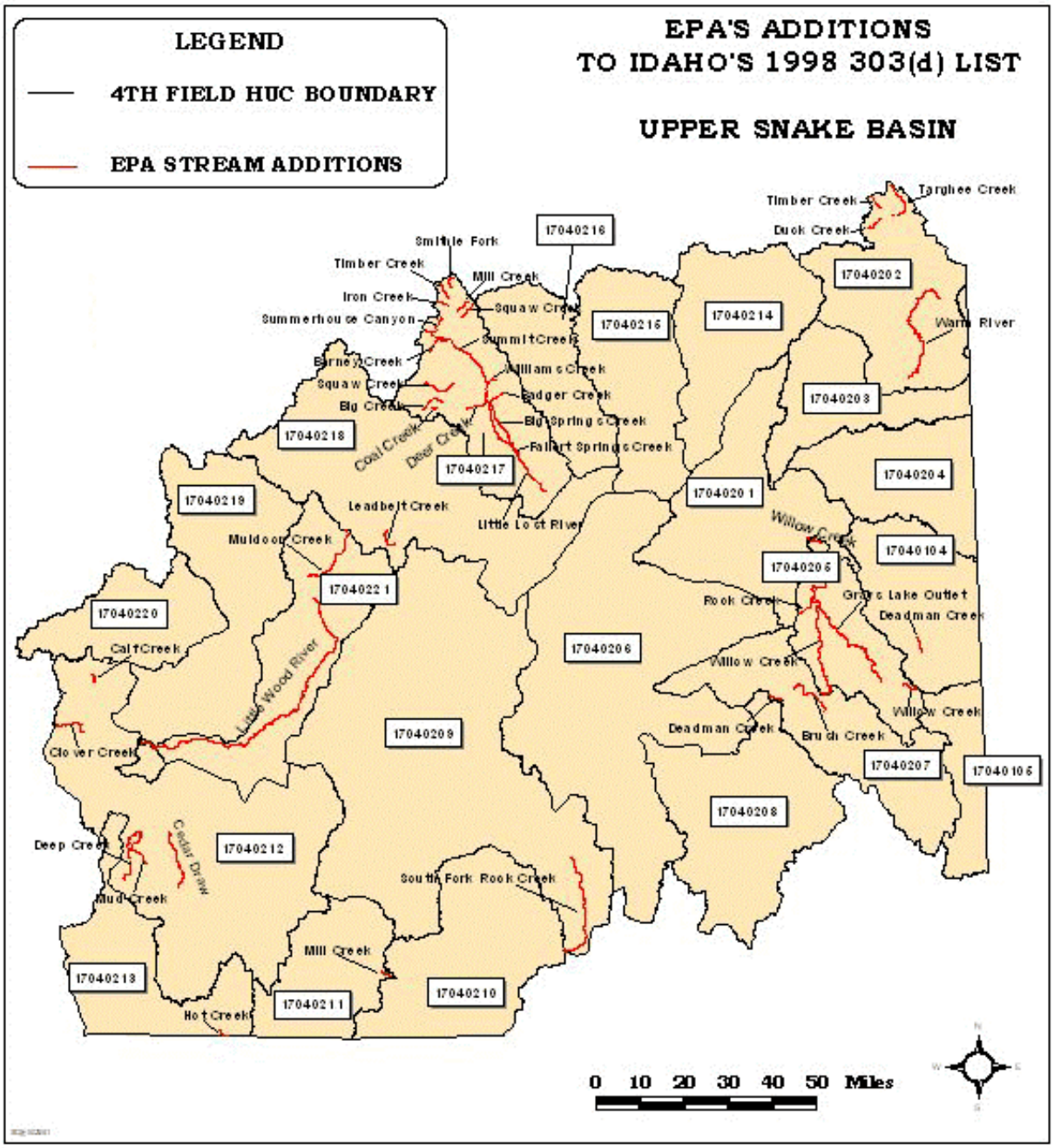
LEGEND
4TH FIELD HUC BOUNDARY
EPA STREAM ADDITIONS
EPA'S ADDITIONS
TO IDAHO'S 1998 303(d) LIST
UPPER SNAKE BASIN
17040216
17040215
17040214
17040202
17040203
17040204
17040201
17040104
17040206
17040105
17040207
17040208
17040209
17040218
17040217
17040219
17040221
17040220
17040212
17040213
17040211
17040210
Timber Creek
Duck Creek
Targhee Creek
Warm River
Smiths Fork
Timber Creek
Mill Creek
Iron Creek
Squaw Creek
Summerhouse Canyon
Summit Creek
Barney Creek
Williams Creek
Squaw Creek
Badger Creek
Big Creek
Big Spring Creek
Fallert Springs Creek
Coal Creek
Deer Creek
Leadbelt Creek
Little Lost River
Muldoon Creek
Willow Creek
Rock Creek
Grays Lake Outlet
Deadman Creek
Willow Creek
Deadman Creek
Bruch Creek
Willow Creek
Little Wood River
Calf Creek
Clover Creek
Deep Creek
Cedar Draw
Mud Creek
South Fork Rock Creek
Mill Creek
Hot Creek
0 10 20 30 40 50 Miles

TABLE 8
Water Quality Limited Streams Within The Upper Snake Province
PAGE 1 OF 7

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TABLE 9
Summary of TMDLs Completed to Date for the Upper Snake Province

Watershed	IDEQ Final	EPA Approved
Big Lost River	May 2004	August 2004
Fall Creek	October 2003	April 2004
Upper Henry's Fork	December 1998	Not required.
Lemhi River	December 1999	March 2000
Idaho Falls	May 2004	- -
Little Lost River	August 2000	September 2000
Medicine Lodge	February 2003	May 2003
Palisades	January 2001	February 2001
Teton	January 2003	February 2003
Teton Supplement (Moody, Fox, and Spring Creeks)	June 2003	September 2003
Willow Creek	May 2004	June 2004
American Falls	Public comment August 2004.	- -
Blackfoot River	December 2001	April 2002
Portneuf River	March 2001	April 2001
Goose Creek	December 2003	July 2004
Lake Walcott	May 2000	June 2000
Raft River	May 2000	June 2000
Billingsley Creek	Public comment July 2003.	- -
Upper Snake-Rock	July 2000	August 2000

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USEPA 2001. United States Environmental Protection Agency, Region 10, EPA adds 127 waters to Idaho's 1998 list. January, 25, 2001.

DRAFT ADDENDUM APPENDIX A

Comments

DRAFT ADDENDUM APPENDIX B

Key Issues from the Council

DRAFT ADDENDUM APPENDIX C

Tribal Data Not Included in the Original Assessment

DRAFT ADDENDUM APPENDIX D

Meeting Notes from September 2003 to March 2004