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Interior Columbia Basin Supplemental Draft Environmental Impact Statement

Appendix 15 - Development of Restoration Priorities

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Supplemental Draft Environmental Impact Statement

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General Restoration Approach, Alternatives S2 and S3

Restoration needs in the interior Columbia Basin are diverse, intensive, and widespread. In the context of landscape dynamics, restoration is needed in aquatic and riparian areas, rangelands, and forestlands. In Alternatives S2 and S3, a key focus of management direction is to accomplish restoration in an integrated fashion to benefit aquatic and terrestrial species, forest health, rangeland health, and watershed health. Restoration also is intended to focus on needs and opportunities in isolated and economically specialized communities and tribal communities, through economic and social targets and spin-offs related to land and water restoration.

Restoration management activities can be either more active or more passive. Active restoration can take various forms, including:

- Control of noxious weeds with mechanical, chemical, or biocontrol agents;
- Thinning of over-dense stands of trees to reduce fuel levels in order to reverse the trend toward increasingly large, severe, and frequent wildfire;
- Improving or moving roads to reduce the chance of sediment delivery to water, or so they will be farther from water; and
- Targeting contracts for restoration management activities to rural and tribal communities, to foster rural and tribal employment.

Passive restoration could include implementation of more restrictive, hands-off management direction that is primarily protection-oriented.

Both action alternatives (Alternatives S2 and S3) use a consistent ecosystem-based restoration strategy for balancing opportunities to accomplish desired outcomes. Inherent in both alternatives is some level of ecological and economic risk involved, either in conducting management actions or in taking no management actions. Risk can be short term or long term. The location, timing, and intensity of management actions can vary depending on what level of risk is acceptable, given the site-specific situation. Site-specific risks and opportunities need to be considered in the broader context of larger-scale processes and conditions.

Alternatives S2 and S3 manage short- and long-term risk through management direction and through spatial (geographic) identification of conservation or restoration areas, some of which are more protection-oriented with less willingness to accept risk, and others of which are more restoration-oriented with a heightened willingness to accept certain types and levels of risk. Alternative S2 focuses more on minimizing short-term risk from management activities, especially to threatened, endangered or proposed species, important species habitats, and riparian areas; to some extent this constrains opportunities to address long-term risks through habitat restoration. Alternative S3 also limits short-term risk from management activities but accepts more short-term risk from human-caused disturbance than Alternative S2; it focuses more on moving ahead to address long-term risk faster, while protecting or maintaining important habitats. The alternatives also concentrate the focus of restoration on particular subbasins to make restoration activities more effective, efficient, and ecologically beneficial to isolated and economically specialized communities.

The restoration strategy in Alternatives S2 and S3 combines the spatial identification of certain areas with requirements for reviewing the conditions, risks, and opportunities associated with land, water, and socio-economic-tribal restoration in subbasins and watersheds, through the Subbasin Review process and Ecosystem Analysis at the Watershed Scale (EAWS).

Specific Components of the Restoration Strategy

Base Level Management Direction

Base level direction amends management direction in existing land use plans. Management actions are intended to maintain and prevent decline in resource conditions and to promote desirable resource conditions. The specific location, timing, and intensity of these management actions would depend on acceptable levels of risk determined at the local level, considering both the risks from management actions and the risks from no action, in the short term and

long term. Fine-scale risks are to be considered in the context of larger scale processes and conditions.

In the short term and long term, some restoration activity is to be expected in base level areas (that is, outside high restoration priority subbasins and outside A1, A2, or T areas). Through finer scale or locally important restoration emphases, parts of the landscape can be made resilient to disturbance in the short term, enabling managers to prevent further declines in landscape processes and functions to preserve long-term management options. In Alternative S2, there is a greater emphasis on locating management activities in areas where short-term risk would be minimized; in Alternative S3, there is a greater emphasis on locating management activities where long-term risk would be minimized.

The expectation is that to maintain resource conditions, some management activities typically oriented towards restoration and improvement (for example, noxious weed control directed at reducing extent of noxious weed infestations) would also be desirable for maintenance (for example, securing riparian habitat from noxious weed invasion).

The following list includes examples of resource conditions and factors of influence that are a focus of management in the base level section:

- Noxious weeds;
- Rangeland source habitats that have declined substantially in geographic extent from the historical to current period;
- Old forests;
- Plants of cultural significance to tribes;
- Water quality;
- Air quality;
- Road-related risks and adverse effects;
- Riparian and wetland vegetation;
- Physical integrity of aquatic areas, such as shorelines, banks, and bottom configurations;
- Economic activity for isolated and economically specialized communities and tribal communities.

Restoration Management Direction

Locally identified restoration priorities: Restoration will continue to proceed in areas that are locally identified as priorities for restoration. ICBEMP restoration direction focuses on broad-scale issues that cross more than one administrative unit yet are applicable within individual administrative units if the appropriate conditions are found.

Broad-scale functional restoration priorities: Six restoration maps were developed to provide administrative units with broad-scale context during Subbasin Review as they step down broad-scale restoration priorities to set priorities for local restoration activities (see Maps 3-2 through 3-7 in Chapter 3). This was done by highlighting those subbasins that have numerous functional restoration priorities (that is, for landscape, aquatics, water quality, old forest / rangeland habitat, economics, and tribal components) and good opportunity for restoration to be achieved through Forest Service and / or BLM management actions. The maps are intended to provide information for Forest Service regional and BLM state offices to influence budget planning. Details on the development of these maps is provided later in this appendix.

Broad-scale high restoration priority subbasins: Forty subbasins were identified as broad-scale high restoration priority for Alternative S2 (see Map 3-8) and 51 subbasins were identified for Alternative S3 (see Map 3-9). They were derived from the broad-scale functional restoration priority maps described above. The intent for these high restoration priority subbasins is to concentrate restoration efforts and make restoration activities effective and efficient. Details on the development of these maps is provided later in this appendix.

Management direction related to succession / disturbance regimes and other aspects of landscape restoration is intended to provide the foundation for other restoration activity. The intent of landscape restoration direction is to repattern vegetation patches and succession / disturbance regimes and to restore watersheds and streams to a condition that is more consistent with landform, climate, and biological and physical characteristics of the ecosystem. Such restored ecosystems are more resilient to disturbances and more predictable, and they will provide the range of habitats needed by aquatic and terrestrial species. This risk-management strategy conserves scarce habitats in the short term while expanding habitats through restoration in the long term.

The social-economic-tribal component of restoration direction highlights areas where restoration activities have a direct influence on economic, social, and cultural needs. This direction is inextricably linked to restoration direction provided for landscape, terrestrial, and aquatic / riparian / hydrologic systems. Specific considerations also are provided for designing and imple-

menting restoration activities in ways that promote workforce participation, serve demands for commodity products, encourage intergovernmental collaboration, and consider tribal needs and interests.

Restoration in all cases is intended to be consistent with direction for aquatic A1 and A2 subwatersheds, terrestrial T watersheds, riparian areas, and threatened, endangered, and proposed species habitats. Restoration management activities also are intended to be consistent with approved recovery plans for federally listed species where applicable.

The following list includes examples of resource conditions and factors of influence that are a focus of restoration in the Restoration Management Direction section in Chapter 3:

- Succession-disturbance regimes, more consistent with landform, climate, and soils;
- Improved water quality;
- Road-related risks and adverse effects;
- Increasing forestland, woodland, rangeland, and riparian source habitats that have declined substantially in geographic extent from the historical to current period;
- Biological crust development;
- Plant diversity in rangeland seedings;
- Improved instream and riparian habitat;
- Connectivity of high-quality aquatic habitats;
- Economic activity for economically specialized communities and tribal communities.

Restoration in Aquatic A2, Terrestrial T, and Aquatic A1 Areas

Restoration management direction discussed previously can be implemented within aquatic A1 and A2 subwatersheds and terrestrial T watersheds (see Maps 3-10, 3-11, and 3-12 in Chapter 3) . However, these mapped areas have specific management intents and their own associated management direction which provide specific sideboards on restoration expectations and willingness to accept risk. Any restoration management direction must be implemented within these sideboards. The spatially identified areas are described here in order of most to least focus on restoration: aquatic A2 (restoration focus), terrestrial T (short-term conservation focus, long-term restoration focus), and aquatic A1 (conservation focus).

Aquatic A2 Subwatersheds

Characteristics of Aquatic A2 Subwatersheds

Aquatic A2 subwatersheds include the same important fish populations as for A1 subwatersheds, that is, one or more of the following:

1. Known strong populations for the seven key salmonids (bull trout, steelhead trout, stream-type chinook salmon, ocean-type chinook salmon, westslope cutthroat trout, redband trout, and Yellowstone cutthroat trout; based on 1994 aquatic assessment data);
2. Important anadromous fish populations in the Snake River Basin;
3. Genetically pure populations of anadromous fish outside the Snake River Basin; and
4. Fringe populations for four of the key salmonids.

Aquatic A2 subwatersheds have predicted road densities of moderate, high, or very high and less than 50 percent congressionally designated wilderness. The number of subwatersheds identified as A2 subwatersheds differs between Alternatives S2 and S3 because the percent of Forest Service- and / or BLM-administered land differs.. Also, in Alternative S2, aquatic A2 subwatersheds will be adjusted as needed prior to signing the ICBEMP ROD; and subsequent adjustments can be made through land use plan revisions or amendments; in Alternative S3, adjustments would only be made through land use plan revision or amendment.

Restoration Expectations and Willingness to Accept Risk from Restoration

Active management is intended to take place within A2 subwatersheds to secure a network of connected aquatic habitats. Since predicted road densities are moderate or higher in A2 subwatersheds, opportunities may exist to access and restore uncharacteristic vegetation patches and patterns while meeting the A2 subwatershed and aquatics objectives. Therefore, it is expected that higher levels of road management and watershed restoration would occur in A2 subwatersheds than in A1 subwatersheds. However, management activities (such as watershed restoration, noxious weed treatment, prescribed fire, and pre-commercial thinning) within aquatic A2 subwatersheds are intended to pose low risk of sediment delivery and low risk of adversely affecting the hydrologic regime and riparian areas, in order to achieve the goal of facilitating and contributing to recovery of widely distributed salmonid fish species

and other associated aquatic and riparian species. *Management direction tied to A2 subwatersheds thus reflects a restoration focus but a concomitant low willingness to accept risk from active restoration activities.*

Terrestrial T Watersheds

Characteristics of Terrestrial T Watersheds

[Note: The following discussion applies to both Alternatives S2 and S3].

Terrestrial T watersheds were identified based on whether they contained source habitat for one or more of 5 "Families" of terrestrial species, which are a subset of 12 Families described in Wisdom et al. (in press). These 5 Terrestrial families represent groups of species associated with habitats that have declined substantially in the project area since historical times.

Source habitats are the vegetative cover types and structural stages that contribute to stable species populations or population growth in a specified area and time. Source habitats support long-term population persistence.

T watersheds contain source habitats that are relatively similar in pattern across the landscape compared with historical vegetation patterns (that is, they have low departure from historical patterns). T watersheds have at least 5 percent BLM- or Forest Service-administered land, but most T watersheds contain more than 80 percent BLM- or Forest Service-administered land. While every acre of source habitat within T watersheds is not necessarily of highest quality, T source habitats can be considered the most sustainable through time compared with source habitats in other watersheds.

Restoration Expectations and Willingness to Accept Risk from Restoration

Management actions—such as weed control, thinning, prescribed burning, and altered livestock grazing management strategies—are expected to be used in terrestrial T watersheds as needed to maintain, secure, and restore source habitats. Land uses such as livestock grazing and timber harvest are allowed if they are consistent with the objectives and management intent for T watersheds. The intent of restoration in T watersheds in the long term is to recruit additional source habitats that have declined substantially from the historical to current period, to increase their geographic extent and connectivity where possible, and to repattern source habitats where and when necessary.

A critical premise of the T watershed management intent and associated management direction is that conserving source habitats in the short and long term and restoring them in the long term will help to achieve long-term viability of terrestrial species of concern in the project area. T watersheds were identified with the purpose of being used as "anchor points" in the short term, for the long-term creation of a well-distributed network of secure and productive habitats, which should ensure the long-term survival of populations or species.

In both the short and long term, there is a low willingness to accept risk from active restoration activities or land uses that could contribute to the decline in geographic extent, connectivity, and condition of source habitats, when considering the T watershed as a whole.

Management intent for T watersheds thus is conservation-oriented in the short term, and comparatively more restoration-oriented in the long term.

Aquatic A1 Subwatersheds

Characteristics of Aquatic A1 Subwatersheds

Aquatic A1 subwatersheds include the same important fish populations as for A2 subwatersheds, that is one or more of the following:

1. Known strong populations for the seven key salmonids (bull trout, steelhead trout, stream-type chinook salmon, ocean-type chinook salmon, westslope cutthroat trout, redband trout, and Yellowstone cutthroat trout; based on 1994 aquatic assessment data);
2. Important anadromous fish populations in the Snake River Basin;
3. Genetically pure populations of anadromous fish outside the Snake River Basin; and
4. Fringe populations for four of the key salmonids.

Aquatic A1 subwatersheds have predicted road densities of none, very low, or low or have at least 50 percent congressionally designated wilderness. The amount of land identified as an A1 subwatershed differs between Alternatives S2 and S3 in percent of Forest Service- and / or BLM-administered land.

Restoration Expectations and Willingness to Accept Risk from Restoration

In A1 subwatersheds, the intent of management is to protect important fish populations by conserving and maintaining subwatershed and aquatic habitat conditions, processes, and functions. It is expected that these subwatersheds are currently near attainment of aquatics objectives; that is, they are in good condition. They are to be managed to ensure that these conditions are protected and maintained, and to facilitate and contribute to the recovery of widely distributed salmonid fish species and other associated aquatic and riparian species.

While widespread and frequent active restoration activities are not expected to be needed in A1 subwatersheds, some management activities (for example, noxious weed treatments, prescribed fire, "wildland fire use for resource benefit", and non-commercial thinning) could be initiated if appropriate and necessary to address substantial and apparent short-term risks to the aquatic and riparian system. However, all such management activities are to be designed to pose very low risk of sediment delivery and very low risk of adversely affecting the hydrologic regime and riparian areas. *Management direction tied to A1 subwatersheds thus reflects a conservation focus and a very low willingness to accept risk from active restoration activities.*

Role of Subbasin Review and Ecosystem Analysis at the Watershed Scale

Ecosystem Review at the Subbasin Scale (Subbasin Review) and Ecosystem Analysis at the Watershed Scale (EAWS) are steps in a hierarchical assessment process that applies broad-scale science findings and management decisions to finer-scale areas, by providing an understanding of ecosystem status and risks and by identifying opportunities to conserve and restore the ecosystem.

Subbasin Review and EAWS can increase the chances that restoration management activities will accomplish the desired outcomes, by providing a broader landscape context that guides the type, location, and sequencing of restoration management activities within a subbasin and within its watersheds. A subbasin context (commonly between 800,000 and 1 million acres) provides a big-picture view that can heighten understanding of how all the components interact. With this knowledge, the risks—whether from active or passive restoration actions, or from natural disturbance events—can be anticipated, planned for, and thus managed so they do not prevent achievement of desired outcomes.

In Alternative S2, Subbasin Review is required to be completed within two years of the signing of the ICBEMP ROD for the 40 subbasins identified as broad-scale high restoration priority (see further discussion in the Development of the Restoration Priority Maps section later in this document). Subbasin Review is required on the remaining subbasins within five years after the ROD is signed. Conducting Subbasin Reviews in the high priority subbasins first ensures that the mid-scale level of analysis occurs first where it is anticipated that the most activity will occur. In Alternative S3 there is more flexibility for the scheduling of Subbasin Review within the five-year timeframe.

In Alternative S2, *EAWS* is required to be conducted prior to planning and designing resource management activities, including restoration, in certain situations or locations. This is designed to generate a more detailed understanding provided by EAWS for areas where the greatest risks from management activities exists. Situations or locations requiring EAWS under Alternative S2 are the following:

1. Where activities have the potential to negatively impact threatened, endangered, or proposed aquatic species or their habitats, or the source habitats within T watersheds that have declined substantially in geographic extent from the historical to current period. The only exception is where impacts are anticipated to be negligible, short term, and localized in scope; and
2. In subbasins identified as broad-scale high restoration priority; the location and timing of watersheds or subwatersheds requiring EAWS is to be determined through Subbasin Review.

Alternative S3 is less risk-averse in the short term. EAWS is not required by certain situations or in certain locations prior to conducting restoration or other management activities. New and ongoing actions are to be evaluated during Subbasin Review to identify the priority and schedule for completing EAWS that may be needed in the subbasin. The context provided by Subbasin Review is meant to help decision makers balance short- and long-term risks to resources, such as listed or proposed species, within the subbasin.

Development of the High Restoration Priority Maps

Subbasins identified as high restoration priority for the Alternatives S2 and S3 in the ICBEMP Supplemental Draft EIS were derived from broad-scale functional (old forest / rangeland habitat, aquatic, water quality, economic, and tribal) maps and a landscape restoration map (see summary list of maps below). The intent for high restoration priority subbasins is to direct restoration efforts toward several purposes concurrently (such as for aquatic and riparian habitat, water quality, vegetation management to improve habitat for terrestrial vertebrate species of concern, and tribal community employment) to make restoration activities more ecosystem-based, and to achieve improvement in several needs concurrently.

Identification of these subbasins was based on:

1. Risk to aquatic and terrestrial species and their habitats, water quality, and hydrologic processes, from disturbances (natural and management-induced) such as wildfire, excessive livestock grazing pressure, exotic undesirable plant invasion and spread, forest epidemics of insects and disease, and natural topography and climate (for example, steep terrain, aridity, propensity to drought);
2. Opportunity for restoration management actions to reduce that risk;
3. Ability to expand and provide connectivity for scarce aquatic and terrestrial habitats;
4. Ability to sustain social and economic well-being of isolated and economically specialized communities; and
5. Ability to enhance employment and economic opportunities in tribal communities and the availability of resources associated with the rights and interests of involved federally recognized tribes.

All 164 subbasins in the project area were included as the backdrop context from which these subbasins were identified.

The major difference between subbasins identified for restoration priority in Alternative S2 compared to Alternative S3 is that a greater proportion of subbasins in Alternative S3 were identified to direct restoration efforts toward economically specialized communities and tribal communities. The restoration efforts in these subbasins are intended to sustain production of products (traditional commodities, such as wood products, and others commodities / amenities, such as plants that are culturally significant to tribes) to help sustain social and economic aspects of these communities.

Broad-scale Functional Restoration Priority Maps

Six maps were developed in the Spring of 1999 and then used to derive the integrated high restoration priority subbasins. These maps are listed here, followed by the steps taken to create these maps, and a summary of each map.

- Broad-scale Landscape Restoration Priorities (Map 3-2)
- Broad-scale Aquatic Restoration Priorities (Map 3-3)
- Broad-scale Water Quality Restoration Priorities (Map 3-4)
- Broad-scale Old Forest / Rangeland Habitat Restoration Priorities (Map 3-5)
- Broad-scale Economic Restoration Priorities (Map 3-6)
- Broad-scale Tribal Restoration Priorities (Map 3-7).

In addition to these six functional restoration priority maps, a seventh map was used—Subbasins with Isolated and Economically Specialized Communities (Map 2-33).

Broad-scale Landscape Restoration Priorities

Map 3-2 has 4 components:

1. High restoration priority.
2. Moderate restoration priority.
3. Low restoration priority.
4. No restoration priority.

The development of Map 3-2 relied heavily on the use of variables that were calculated at the subwatershed

scale, then aggregated up to the subbasin scale. These variables were selected for their ability to reflect status, risk, and opportunity of various resources within the project area and are described fully within the Draft Integrated Status, Risk, and Opportunity Analysis (Quigley et al. 1998). Specific variables used in the development of this map are included within the following steps.

The steps involved in creating these components included several rulesets from the draft Landscape Restoration Strategy (Sloan and Karl 1999). The steps are:

1. For each of the 164 subbasins in the project area, landscape health risk was rated on BLM- and Forest Service-administered lands using the following ruleset:

   If H4FHR *and* H4RHR = NA, **then H4LDHR = NA** where H4 = subbasin,
   FHR = Forest Health Risk,
   RHR = Rangeland Health Risk,
   LDHR = Landscape Health Risk,
   NA = Not Applicable

   If H4FHR *or* H4RHR = High or Moderate, *and* H4WSR = High, **then H4LDHR = High**
   where WSR = Watershed Risk

   If H4FHR *or* H4RHR = High or Moderate, *and* H4WSR = Moderate, **then H4LDHR = Moderate**
   Else H4LDHR = Low

   The Forest Health Risk, Rangeland Health Risk, and Watershed Risk variables at the subbasin scale were each composed of different variables taken from the following list. The variables in this list were calculated at the subwatershed scale, then aggregated up to the subbasin scale:

   SIM = similarity to native succession / disturbance regime and vegetation composition and structure
   HSV_C = hydrologic system vulnerability
   SFER_C = current severe fire effects risk
   EPIV_** = exotic plant invasion vulnerability
   FHV_C = current forest health vulnerability
   RHS = rangeland health soil vulnerability
   RHV_C = current rangeland health vegetation vulnerability
   SnPatClass = extent of permitted grazing and season of use pattern class risk

2. For each of the 164 subbasins in the project area, landscape health opportunity was rated on BLM- and Forest Service-administered lands using the following ruleset:

   If H4FHO *and* H4RHO = NA, **then H4LDHO = NA** where FHO = Forest Health Opportunity,
   RHO = Rangeland Health Opportunity,
   LDHO = Landscape Health Opportunity

   If H4FHO *or* H4RHO = High, *and* H4FFO *or* H4WSO = High, **then H4LDHO = High**
   where FFO = Fire and Fuels Opportunity,
   WSO = Watershed Opportunity

   If H4FHO *or* H4RHO = High, *and* H4FFO *or* H4WSO = Moderate, **then H4LDHO = Moderate**
   Else H4LDHO = Low

   The Forest Health Opportunity, Rangeland Health Opportunity, Fire and Fuels Opportunity, and Watershed Opportunity variables at the subbasin scale were each comprised of different variables taken from the following list. The variables in this list were calculated at the subwatershed scale, then aggregated up to the subbasin scale:

   FSR = forest structure restoration opportunity
   WFM = woody fuel management opportunity
   PFO_P = prescribed fire opportunity from planned ignitions
   PFO_U = prescribed fire opportunity from unplanned ignitions
   GRO = grazing allotment management plan revision opportunity
   SIM = similarity to native succession / disturbance regime and vegetation composition and structure
   HSV_C = hydrologic system vulnerability
   RoadClass = road density class

3. For each of the 164 subbasins in the project area, landscape restoration priority was rated on BLM- and Forest Service-administered lands using the following ruleset:

   If H4LDHR *and* H4LDHO = NA, **then H4LRP = NA** where LRP = Landscape Restoration Priority and these subbasins become component 4.

   If H4LDHR = High or Moderate, *and* H4LDHO = High, **then H4LRP = High** and these subbasins become component 1.

   If H4LDHR = High or Moderate, *and* H4LDHO = Moderate, **then H4LRP = Moderate** and these subbasins become component 2.

Else H4LRP = Low and these subbasins become component 3.

4. If any of the subbasins within components 1 through 3 have less than 5 percent BLM- and Forest Service-administered lands, they are removed and placed into component 4.

Numerous premises were followed in the development of this map:

- Repatterning the vegetation and disturbance frequencies and severities on the landscape to patterns more consistent with what the landforms, soils, and climate will support, will cause the response of landscapes to natural or human-induced disturbances to be more predictable and resilient.
- Managing landscapes according to premise #1 will permit restoration of aquatic-riparian and terrestrial habitats and benefit long-term viability of aquatic and terrestrial species in the project area.
- There will not be enough funding allocated to complete landscape health restoration throughout the entire project area. Restoration activities that are prioritized in space and through time, directed to all components of ecosystems (for example, aquatic and riparian, terrestrial [forests, rangelands, woodlands], social, and economic), with funding allocated to prioritized areas, will more rapidly achieve restoration of entire ecosystems than will restoration activities applied piecemeal to only aquatic, or only terrestrial, or only social, driven by funding that is allocated evenly across the project area.
- After subbasins are rated High, Moderate, or Low priority for landscape restoration, it is left up to field managers to determine the types and combinations of restoration management actions that will achieve the restoration.
- Subbasins rated High for restoration priority have a high risk that disturbances (whether natural or human-induced) will cause future declines in the condition or status of resources, such as aquatic-riparian and terrestrial habitats. These subbasins also have a good opportunity to respond favorably to restoration management actions so that risk will decline. Because these subbasins are most at risk from disturbances, they are the most urgent to restore. This can be achieved most efficiently if there is a relatively high opportunity to reduce that risk.

Summary: Map 3-2 shows subbasins which are recommended for restoring landscapes. The outcome sought with this restoration is to repattern the vegetation and disturbance frequencies and severities to a pattern more consistent with what the landforms, soils, and climate will support, within limitations from human needs, products, and services. The outcomes include benefits to aquatic and terrestrial species in the project area, and more sustainable (that is, predictable over time) supplies of goods and services for human needs.

Broad-scale Aquatic Restoration Priorities

Map 3-3 has 5 components:

1. High restoration priority.
2. Moderate restoration priority.
3. Low restoration priority.
4. Very low restoration priority
5. No restoration priority.

The steps involved in creating these components are:

1. Subbasins were selected that were either classified by the Science Integration Team as Category 2 (Lee et al. 1997) or that contained any A2 subwatersheds, and have at least 5 percent BLM- and Forest Service-administered lands. Category 2 subbasins support important aquatic resources, often with subwatersheds classified as strongholds for one or more species (see Chapter 2 of this EIS for more information). They exhibit an increased degree of fragmentation attributable to habitat disruption or habitat loss, compared with Category 1 subbasins. However, connectivity among watersheds might still exist or could be restored through the mainstem river system, such that maintenance or rehabilitation of fishes' life histories and their dispersal among watersheds is possible. These characteristics of Category 2 subbasins suggest both a need and an opportunity for restoration.

   A2 subwatersheds include important fish populations of one or more of the following: (1) known strong populations for the seven key salmonids (bull trout, steelhead trout, stream-type chinook salmon, ocean-type chinook salmon, westslope cutthroat trout, redband trout, and Yellowstone cutthroat trout; based on 1994 aquatic assessment data); (2) important anadromous fish populations

in the Snake River Basin; (3) genetically pure populations of anadromous fish outside the Snake River Basin; and (4) fringe populations for four of the key salmonids. A2 subwatersheds have less than 50 percent congressionally designated wilderness and have moderate, high, or extreme predicted road densities. These characteristics of A2 subwatersheds sug-gest both a need and opportunity for restoration.

Subbasins that contain less than 5 percent agency lands were judged unsuitable for restoration priority because their lack of BLM- and Forest Service-administered lands reduces the likelihood of being able to enhance connectivity of aquatic habitats.

2. For each subbasin from step 1, a weighted average integrity value was computed from its watershed integrity values. Weighted average integrity values were then normalized by equating the greatest value to 1.00. All lesser integrity values were divided into the greatest integrity value, with the resulting quotient being their normalized score. Thus, these subbasin quotients received normalized scores that ranged between 0 and 1.00.
3. For the subbasins from step 1 that contained A2 subwatershed(s), the total BLM- and Forest Service-administered acres within A2 subwatersheds were divided by the total BLM- and Forest Service-administered acres for the subbasin. The resulting quotients were then normalized, by equating the greatest quotient to 1.00. All lesser quotients were divided into the greatest quotient, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00.
4. For each subbasin from step 1, the normalized scores from step 2 were added to the normalized scores from step 3. These sums were then normalized, with the greatest sum receiving a normalized score of 1.00. All lesser sums were divided into the greatest sum, with the resulting quotient being their normalized score. Thus, each subbasin from step 1 received normalized scores that ranged between 0 and 1.00.
5. Normalized scores from step 4 that were ≥ 0.66 and ≤ 1.00 were rated as High Aquatic Restoration Priority. Normalized scores of ≥ 0.33 and < 0.66 were rated as Moderate. Normalized scores of ≥ 0.05 and < 0.33 were rated as Low. Normalized scores of < 0.05 were rated as Very Low.
6. Any subbasins in the project area not rated for aquatic restoration priority were not Category 2 subbasins or did not contain any A2 subwatersheds, or contain less than 5 percent BLM- or Forest Service-administered lands. These subbasins were labeled as component 5—no aquatic restoration priority.

Three premises were followed in the development of the broad-scale aquatic restoration priorities map (Map 3-3)..

- Category 2 subbasins present the greatest opportunity to reconnect and expand networks of productive habitats. .
- The greater the geographic extent of BLM- and Forest Service-administered lands within A2 subwatersheds, the greater the need and opportunity for aquatic restoration..
- The greater the integrity value for a Category 2 subbasin, the greater is the intactness of the biotic community, and the greater then is the opportunity for restoration management actions to achieve aquatic restoration.

Summary: Map 3-3 shows subbasins which are recommended for aquatic restoration through reconnecting aquatic productive habitats and expanding the network of these aquatic habitats. The outcome sought with this restoration is long-term viability of aquatic species in the project area.

Broad-scale Water Quality Restoration Priorities

Map 3-4 has 4 components:

1. High restoration priority.
2. Moderate restoration priority.
3. Low restoration priority.
4. No restoration priority.

The steps involved in creating these components are:

1. Hydrologic System Vulnerability Departure values were normalized for each of the 164 subbasins in the project area. The greatest value was equated to 1.00, and all lesser values were divided into the greatest value, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00. (Hydrologic system vulnerability was evaluated based on the disruption of the natural hydrologic processes [upland-riparian-aquatic cycle of precipitation, runoff, soil function and erosion, stream flows and sedimentation, and riparian-

aquatic habitats] in response to cumulative effects of human land uses.)

2. Normalized scores from step 1 that were ≥ 0.66 and ≤ 1.00 were rated as High Water Quality Restoration Priority. Normalized scores of ≥ 0.33 and < 0.66 were rated as Moderate. Normalized scores of ≥ 0.05 and < 0.33 were rated as Low. Normalized scores of < 0.05 were rated as Very Low.
3. A value was calculated for Impaired Water Quality for each of the 164 subbasins in the project area. The formula used to compute this value is:

   (miles of 303(d) streams on BLM- and Forest Service-administered lands ÷ total miles of streams on BLM- and Forest Service-administered lands) x percent BLM- and Forest Service-administered lands
4. Values from step 3 were normalized. The greatest value was equated to 1.00, and all lesser values were divided into the greatest value, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00.
5. Normalized scores from step 4 that were ≥ 0.66 and ≤ 1.00 were rated as High. Normalized scores of ≥ 0.33 and < 0.66 were rated as Moderate. Normalized scores of ≥ 0.05 and < 0.33 were rated as Low. Normalized scores of < 0.05 were rated) as Very Low.
6. Subbasins rated Moderate from step 2 and subbasins rated High from step 5 were selected.
7. Subbasins from step 6 containing at least 5 percent BLM- and Forest Service-administered lands were selected.
8. For each of the subbasins from step 7, normalized scores for Hydrologic System Vulnerability Departure (from step 1) and normalized scores for Impaired Water Quality (from step 4) were summed.
9. Summed scores from step 8 were normalized and rated Low, Moderate, and High using the same normalization protocol and rating system mentioned previously. Components 1 through 3 were the outcome of this step.
10. Any subbasins in the project area not rated for water quality restoration priority were labeled component 4.

Several premises were followed in the development of Map 3-4.

- Subbasins rated Moderate for Hydrologic System Vulnerability Departure were selected because they most likely retained a moderate hydrologic integrity and have the capability to respond positively to restoration activities.
- Subbasins rated Low for Hydrologic System Vulnerability Departure were not selected because they do not likely require restoration.
- Subbasins rated High for Hydrologic System Vulnerability Departure were not selected because restoration is presumed to require greater investments compared with subbasins rated as Moderate.

Summary: Map 3-4 shows where, at the broad scale, priorities are recommended for managing water quality concerns, with a focus on maintaining and restoring beneficial uses supported by healthy riparian, aquatic, and wetland ecosystems. The intended outcomes represent the most efficient opportunities for restoring hydrologic integrity and addressing high concentrations of impaired water quality waterbodies on BLM- and Forest Service-administered lands.

Broad-scale Old Forest/Rangeland Habitat Restoration Priorities

Map 3-5 has 6 components:

1. Old forest habitat, high restoration priority on Forest Service- and BLM-administered lands.
2. Old forest habitat, moderate restoration priority on Forest Service- and BLM-administered lands.
3. Rangeland habitat, high restoration priority on Forest Service- and BLM-administered lands.
4. Rangeland habitat, moderate restoration priority on Forest Service- and BLM-administered lands.
5. Low restoration priority for either or both old forest and rangeland habitat on Forest Service- and BLM-administered lands.
6. No restoration priority.

Components 1 and 2: Components 1 and 2 were influenced heavily by six cover type-structural stage (CT-SS) combinations, identified as old forest, all of which declined substantially in geographic extent from the historical to current period. These six CT-SS combinations are:

- Mixed-Conifer Woodlands—Old Multi-Story Woodland
- Whitebark Pine—Old Multi-Story Forest
- Western Larch—Old Multi-Story Forest
- Western White Pine—Old Multi-Story Forest
- Interior Ponderosa Pine—Old Multi-Story Forest
- Interior Ponderosa Pine—Old Single-Story Forest

These six CT-SS combinations were used to rate subbasins for old forest restoration priority. For each of these six CT-SS combinations that existed in the subbasin at either historical, current, or both the historical and current period, the current acres on Forest Service- and BLM-administered lands were subtracted from the historical acres on Forest Service- and BLM-administered lands. These differences were then summed, and the sum was divided by the acres of Forest Service- and BLM-administered lands in the subbasin. For example, see formula below:

[SUM of (Historical Acres FS-BLM) - (Current Acres FS-BLM) for:

Mixed-Conifer Woodlands—Old Multi-Story Woodland, and

Whitebark Pine—Old Multi-Story Forest, and

Western Larch—Old Multi-Story Forest, and

Western White Pine—Old Multi-Story Forest, and

Interior Ponderosa Pine—Old Multi-Story Forest, and

Interior Ponderosa Pine—Old Single-Story Forest]

Divided by: (Subbasin FS-BLM acres)

This formula gets calculated for each of the 164 subbasins, and subbasin FS-BLM acres includes Greater Yellowstone Ecosystem (GYE), Northwest Forest Plan (NWFP), Utah, Nevada, and Wyoming portions of the project area.

Quotients from the formula were then normalized. The greatest quotient was given a normalized score of 1.00. All lesser quotients were divided into the greatest quotient, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00. Negative subbasin quotients did not receive a normalized score.

Normalized scores $\geq$ 0.66 and $\leq$ 1.00 were rated as High. Normalized scores $\geq$ 0.33 and < 0.66 were rated as Moderate. Normalized scores $\geq$ 0.05 and < 0.33 were rated as Low. Normalized scores < 0.05 were rated as Very Low. As the score proceeds from Very Low to High, subbasins show a greater degree of decline in the geographic extent of old forest between the historical and current period.

Subbasins rated High that also contained at least 5 percent of Forest Service- and BLM-administered lands were highlighted as old forest habitat, high restoration priority (component 1). Subbasins rated Moderate that also contained at least 5 percent BLM- or Forest Service-administered lands were highlighted as old forest habitat, moderate restoration priority (component 2). Subbasins with less than 5 percent BLM- or Forest Service-administered lands were judged to be unsuitable for high or moderate rating for restoration priority because their lack of BLM- or Forest Service-administered lands reduces the likelihood of enhancing connectivity of old forest. Subbasins rated Low or Very Low were highlighted in component 5 (see component 5).

This decline in geographic extent of old forest between historical and current depicts changes in condition attributable to both land use changes and changes in composition and structure. In general, the subbasins rated as high and moderate are a reasonable portrayal of the subbasins with the greatest declines in old forest on BLM- and Forest Service-administered lands. They work well to use in broad-scale priority setting for restoration of old forest. The deficiency in this approach is that it does not eliminate the inaccuracy of the CT-SS combinations, an inaccuracy which expresses itself when one assumes that old forest CT-SS locations at the broad scale will also be found exactly in the same locations at the fine scale. Another way of stating this inaccuracy is that just because a 247-acre pixel in the CRBSUM model is labeled an old forest CT-SS combination does not mean that all of the 247 acres really are old forest. More often than not, only a portion of the 247-acre pixel is old forest, and in rare instances, no old forest could be found based on misclassification. Performing this priority rating process at the subbasin scale minimizes the adverse impacts these inaccuracies have on the credibility of the restoration prioritization because the inaccuracies diminish as the scale becomes coarser (for example from subwatershed to subbasin, the inaccuracies diminish).

Components 3 and 4: Components 3 and 4 were not influenced by rangeland CT-SS combinations that declined substantially in geographic extent from the historical to current period at the broad scale and thus they differed from components 1 and 2 (which were habitat-based). Rangeland CT-SS combinations were not used to influence components 3 and 4 because on BLM- and Forest Service-administered lands there was little change in acreage of these habitats from the historical to current period, whether attributable to land use changes or composition and structure changes. Because of this, they were judged inadequate to indicate changes in rangeland condition. A proxy that would more adequately reflect changes in rangeland condition was developed so restoration needs for rangeland habitat could be prioritized.

The proxy involved the use of several risk and opportunity variables, derived from the draft Integrated Status, Risk, and Opportunity Analysis (Quigley et al.

1998). The risk variables represent risk to rangeland condition, and the opportunity variables reflect opportunity to reduce that risk and improve rangeland condition. These variables were landscape-based, meaning they applied to landscapes containing rangelands, forestlands, rangeland–forestland mixtures, riparian areas, aquatic systems, and numerous soil types. These landscape-based risk and opportunity variables (see following list) were used to prioritize restoration needs for rangeland habitat.

The risk and opportunity variables were at the subbasin scale and were put into a ruleset created by the EIS Team, which resulted in classification of subbasins as to their risk and opportunity for landscape health. This two-part premise guided the classification: (1) subbasins dominated by rangelands that are either moderate or high risk to decline in landscape health, that also are either moderate or high opportunity to reduce that risk, are good candidates for restoration; and (2) these subbasins have a moderate to high opportunity that restoration management actions can result in restoration of rangeland source habitats that declined substantially in geographic extent from the historical to current period.

The set of landscape-based variables used to rate subbasin risk and opportunity in the EIS Team-developed ruleset is:

Risk

- Similarity to Native Succession Regimes of Vegetative Composition & Structure (SIM)
- Hydrologic System Vulnerability
- Severe Fire Effects Risk
- Exotic Plant Invasion Susceptibility
- Forest Health Vulnerability to Insects and Disease
- Rangeland Health Soil Vulnerability
- Rangeland Health Vegetation Vulnerability
- Extent of Grazing and Season of Use Risk

Opportunity

- Forest Structure Restoration
- Woody Fuel Management
- Prescribed Fire Opportunity from Planned and Unplanned Ignitions
- Grazing Allotment Management Plan Opportunity
- SIM
- Hydrologic System Vulnerability
- Road Class Density

Subbasins placed in component 3 (high restoration priority rangeland habitat) were highlighted after they met these criteria: (1) subbasins not previously highlighted for components 1 and 2; (2) BLM- and Forest Service-administered lands were at least 5 percent of the subbasin area (this criterion reflects at least some "management" opportunity for restoration to achieve improvement in rangeland condition *across landscapes*); (3) BLM- or Forest Service-administered lands classified as a rangeland potential vegetation group (PVG) contributed 50 percent or more of the BLM- or Forest Service-administered lands (this criterion reflects the subbasins which have the greatest extent of rangelands on BLM- or Forest Service-administered lands); and (4) subbasins were of high or moderate risk of decline in landscape health attributable to disturbances (list of risk variables above shows the disturbances), and were of high opportunity to reduce that risk to landscape health. Subbasins placed in component 4 met the same criteria as for component 3, except that subbasins were of moderate opportunity, rather than high opportunity, to reduce the high or moderate risk of decline in landscape health.

Component 5: Subbasins were rated Low Priority for restoration of old forest and/or rangeland habitat if: (1) they were not already highlighted for components 1 through 4; and (2) if they were highlighted as having a high opportunity for increasing geographic extent of habitats for one or more of Terrestrial Families 1 and 2 (old forest habitat dependent), and 10, 11, and 12 (rangeland and/or woodland habitat dependent) on the Proposed Terrestrial Family Habitat Restoration Emphasis map (see Map 2-11a in Chapter 2). This map was developed from maps in Wisdom et al. (in press). High opportunity for a Terrestrial Family in a subbasin is defined in Wisdom et al. (in press) as more than 50 percent of the watersheds within a subbasin with at least 20 percent decline in the geographic extent of habitats from the historical to current period, for more than half of the terrestrial groups within the Terrestrial Family. This definition of opportunity, particularly if applied to rangeland habitats on BLM- or Forest Service-administered lands, does not adequately reflect declines in rangeland condition and needs for restoration, nor does it address the ability of the rangeland to respond favorably to restoration management actions. As such, it differs from the landscape-based definition of opportunity used to prioritize subbasins for rangeland habitat restoration (components 3 and 4).

Component 6: Subbasins with no restoration priority rating were those not already highlighted in components 1 through 5. These subbasins were not highlighted as having a high opportunity for Terrestrial Families 1, 2, 10, 11, or 12 on the Map 3-11b, and

several of these subbasins had less than 5 percent BLM- and Forest Service-administered lands.

Summary: Map 3-5 shows areas with a high priority to increase the geographic extent and connectivity of old forest. The map also shows areas with a high priority to restore rangeland habitat. This restoration can proceed in several ways, including increasing the geographic extent and connectivity of rangeland habitats that have declined substantially from the historical to current period at the broad scale, improving rangeland condition at finer scales by improving the structural diversity of the vegetation, and improving the ability of the soil to capture, store, and release water. An important outcome sought with this restoration is assisting in achieving long-term viability of terrestrial species of concern in the project area.

Broad-scale Economic Restoration Priorities

Map 3-6 has 5 components:

1. High restoration priority.
2. Moderate restoration priority.
3. Low restoration priority.
4. Very low restoration priority.
5. No restoration priority.

The steps involved in creating these components are:

1. For each of the 164 subbasins in the project area, their economic isolation / specialization scores (which ranged between 0 and 11) for Economically Specialized and Isolated Communities (see Subbasins with Eocnomically Vulnerable Communities section, later in this appendix) were normalized. The greatest score was equated to 1.00, and all lesser scores were divided into the greatest score, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00.
2. For each of the 164 subbasins in the project area, normalize the percent BLM-Forest Service ownership. The subbasins with 100 percent BLM-Forest Service ownership received a normalized score of 1.00, and all lesser percentages of BLM-Forest Service ownership were divided into the 100 percent, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00.
3. For each of the 164 subbasins in the project area, normalize the percent wilderness. The greatest percent was equated to 1.00, and all lesser percentages were divided into the greatest percent, with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00.
4. For each of the 164 subbasins in the project area, insert the normalized scores from steps 1, 2, and 3, into the following formula:

   (Normalized Economic Isolation / Specialization score x 2) + (Normalized BLM-Forest Service ownership score) - (Normalized Wilderness score)

5. Normalize the output values from step 4. Use the same normalization protocol mentioned previously.
6. Normalized scores from step 5 that were ≥ 0.66 and ≤ 1.00 were rated as High Economic Restoration Priority. Normalized scores of ≥ 0.33 and < 0.66 were rated as Moderate. Normalized scores of ≥ 0.05 and < 0.33 were rated as Low. Normalized scores of < 0.05 were rated as Very Low. The output from this step is components 1 through 4.
7. Any subbasins in the project area not rated for economic restoration priority were labeled component 5.

Several premises were followed in the development of Map 3-6:

a. Subbasins with greater economic isolation / specialization scores (as calculated in step 6 [b and c] for Map 2-33) should be candidates that receive greater restoration priority. This restoration priority would refer to receiving restoration investments that generate economic activity.

b. The greater the percentage of BLM-Forest Service ownership within a subbasin, the greater the potential is for that subbasin to justify restoration investments of a magnitude sufficient to have an economic effect on nearby communities.

c. The greater the percentage of BLM- and Forest Service-administered lands legislatively designated as Wilderness, the lesser the potential for restoration investments to cause discernible economic effects on nearby communities.

Summary: Map 3-6 shows subbasins where federal land management policy (whether it changes or continues unchanged) is likely to have the greatest

effect on social and economic welfare. It also reflects where the desire is greatest to design and implement a biophysical restoration strategy [that is, concurrent restoration of aquatic, water quality (hydrologic processes), and old forest / rangeland habitat] *that serves economic objectives*.

Broad-scale Tribal Restoration Priorities

Map 3-7 has 5 components:

1. Very high restoration priority.
2. High restoration priority.
3. Moderate restoration priority.
4. Low restoration priority.
5. No restoration priority.

The steps involved in creating these components are:

1. Use two maps in the Draft Integrated Status, Risk, and Opportunity Analysis (Quigley et al. 1998) as the basis for further steps. These two maps are titled Subbasin Tribal, Treaty, and Trust BLM / Forest Service Status, and Subbasin Tribal, Treaty, and Trust BLM / Forest Service Opportunity.
2. Apply an EIS Team-developed ruleset to subbasins on the two maps in step 1 to develop a map titled Priority Emphasis for Tribal, Treaty and Trust BLM / Forest Service Lands. The ruleset, definitions, and premises used to develop the ruleset are as follows:

   In the following ruleset, Status and Opportunity originate from the two maps in step 1.

   If Status = High, then the Priority = Moderate, unless Opportunity = Low, then priority is adjusted to Low.

   If Status = Moderate, then Priority = High, unless Opportunity =Low, then priority is adjusted to Low.

   If Status = Low, then Priority = Low, unless Opportunity = High, then Priority is adjusted to Moderate.

   The definition of Status = subbasin status of tribal, treaty, and trust resources on BLM-and Forest Service-administered lands rated High, Moderate, or Low. Proximity to reservations, culturally important fish, animal (big game and livestock forage) resources, plant resources (wood, food, and medicinal), road and trail access to these resources, native or "natural" character of landscapes, and protection of cultural resources and sacred sites, were either directly or indirectly evaluated and used to drive the rating of Status.

   The definition of Opportunity = subbasin opportunity to reduce risk (likelihood of an event that leads to circumstances that adversely affect tribal, treaty, and trust resources) or improve status of tribal, treaty, and trust resources on BLM- and Forest Service-administered lands. Land ownership, proximity to reservations, and other factors were either directly or indirectly evaluated and used to drive the rating of Opportunity.

Premises used in developing this ruleset were:

- High Status subbasins were automatically assigned a moderate priority for restoration of tribal, treaty, and trust resources because the management focus is conservation-oriented more than restoration-oriented, given that High Status reflects relatively good condition.

- Moderate Status subbasins were automatically assigned a high priority for restoration of tribal, treaty, and trust resources because the moderate status was interpreted as meaning a capability to respond positively to restoration activities and a capability of improving to High Status. Further, observation of where these Moderate Status subbasins were positioned in the project area showed that they often were next to High Status subbasins. By assigning them high priority for tribal restoration, the expectation was that they would be improved to High Status, and connectivity of High Status subbasins would therefore be enhanced.

- Low Status subbasins were automatically assigned a low priority for restoration of tribal, treaty, and trust resources because these subbasins were relatively farther from reservations and this reflects less value to tribes for restoring them. The Low Status reflects poorer resource condition and a relatively less rapid recovery attributable to restoration activities.

- Lastly, Opportunity rating was used as an adjustment factor for Priority rating. Where opportunity is greatest, priority was adjusted upward, and where opportunity was least, priority was adjusted downward.

3. Using the map Priority Emphasis for Tribal, Treaty and Trust BLM / Forest Service Lands from

step 2, identify the subbasins rated High and visually assess their distribution across the project area. The ICBEMP tribal liaison performed this distribution assessment and used the criterion that each tribe (for tribes both within and adjacent to the project area) had to have at least one of the High-rated subbasins selected which was either next to or as close to their reservation as possible.

4. Selected subbasins from step 3 were changed from a High to a Very High rating. Sixteen subbasins were selected and rated Very High. These sixteen subbasins became component 1. The subbasins rated High on the map Priority Emphasis for Tribal, Treaty and Trust BLM / Forest Service Lands that were not selected and changed to Very High, became component 2. Subbasins rated Moderate, Low, and None became components 3, 4, and 5, respectively.

Summary: Map 3-7 shows subbasins that have the greatest need and the greatest opportunity for restoration of resources important to the rights and interests of involved tribes.

Map 3-7 is intended to be used to prioritize restoration to enhance employment and economic opportunities in tribal communities and to enhance availability of resources associated with the rights and interests of involved federally recognized tribes. Table 3-3 in Chapter 3 shows the tribal communities that should be the focus of employment and economic attention. They are the "headquarters" communities, and as such, tend to have the greatest concentration of tribal members and the greatest need for economic and employment assistance.

Subbasins with Economically Vulnerable Communities

Note: The following process was used to identify those subbasins in the project area that have the greatest proportion of communities that are economically "vulnerable," or at risk, to changes in federal land management policies. This information fed into the identification of "economic restoration priority" subbasins (see Map 3-6 discussion). That process combined the "economic vulnerability" subbasin rating with proportions of the subbasin with Forest Service- and BLM-administered lands and with desiganted wilderness to arrive at an "economic priority for restoration" score.

As discussed in this appendix, inegrated restoration priority subbasins were identified using priorities developed for a variety of ecosystem and landscape components, including the social-economic. Chapter 3 management direction puts the highest priority on conducting restoration activities near isolated and economically specialized communities (as defined by Reyna [1998] and discussed in Chapters 2 and 4) that are within those integrated restoration priority subbasins.

Because this was a two-step process -- that is, identify the economic priority subbasins, and then implement restoration activities first near isolated and economically specialized rural and tribal communities within the integrated restoration priority subbasins -- the terminology used below is somewhat different than what is used in the body of the Supplemental Draft EIS.

Map 2-33 has 5 components:

1. High
2. Moderate
3. Low
4. Very low
5. Not identified

The steps involved in creating these components are:

1. Identify communities that are economically specialized in wood products, ranching, and federal (especially BLM and Forest Service) government employment industries, attributable to changes in federal land management policy. These communities were labeled as economically specialized.
2. The following list of variables, developed by either the ICBEMP EIS Team or the ICBEMP Science Integration Team, were used to identify economic specialization within each of the three industries:

Wood Products Industry

- Location Quotient for Wood Products
- Population Size
- Market Score (the sum of Location Quotients for market-oriented industries including services, trade, and finance-insurance-real estate)
- County Type

Ranching Industry

- Location Quotient for Agriculture
- Population Size
- Market Score (the sum of Location Quotients for market-oriented industries including services, trade, and finance-insurance-real estate)

- County Type
- Crop / Livestock Ratio
- Pasture / Farm Ratio

BLM-Forest Service Government Employment Industry

- Location Quotient for Federal Government
- Population Size
- Percent BLM-Forest Service Employment

3. Criteria and how they were used to identify economic specialization within Wood Products Industry:

- Economic specialization for a community was identified if all 3 of these criteria were satisfied: (1) for the Location Quotient for Wood Products variable, a value of 8.7 or greater represents 5 percent or greater employment when the nation is used as the reference region; (2) for the Population Size variable, a community with a population of less than 5,000 was considered economically specialized simply because of its size; and (3) for the Market Score variable, when the Location Quotients for services, trade, and finance-insurance-real estate add up to a value less than an assigned threshold of 1.5, this indicated a lack of diversity and economic specialization.
- Economic specialization for a community was identified if all 4 of these criteria were satisfied: (1) for the County Type variable, if the county was a "timber reliant" county. The County Type variable used a typology developed by ICBEMP scientists, which represented reliance on federal timber; (2) for the Location Quotient for Wood Products variable, if the value was greater than 1.0; (3) for the Market Score variable, when the Location Quotients for services, trade, and finance-insurance-real estate add up to a value less than an assigned threshold of 3.0; and (4) for the Population Size variable, if the community was less than 5,000 people.

  The designation of a community being in a "timber reliant" county was used: (1) to lower the threshold value for the Location Quotient for Wood Products from 8.7 to 1.0; and (2) to raise the threshold value for Market Score from 1.5 to 3.0.

4. Criteria and how they were used to identify economic vulnerability within Ranching Industry:

- Economic specialization for a community was identified if all 5 of these criteria were satisfied: (1) for the Location Quotient for Agriculture variable, a value of 2.31 or greater represents 5 percent or greater employment when the nation is used as the reference region; (2) for the Population Size variable, a community with a population of less than 5,000 was considered economically specialized simply because of its size; (3) for the Market Score variable, when the Location Quotients for services, trade, and finance-insurance-real estate add up to a value less than an assigned threshold of 1.5, this indicated a lack of diversity and economic specialization; (4) for the Crop / Livestock Ratio variable, a value less than 1.5 was considered economically specialized; and (5) for the Pasture / Farm Ratio variable, a value greater than 0.25 was considered economically specialized.
- Economic specialization for a community was identified if all 5 of these criteria were satisfied: (1) for the variable County Type, if the county was a "ranching reliant" county. The County Type variable used a typology developed by ICBEMP scientists, which represented reliance on federal forage; (2) for the Market Score variable, when the Location Quotients for services, trade, and finance-insurance-real estate add up to a value less than an assigned threshold of 3.0; (3) for the Crop / Livestock Ratio variable, a value less than 4.0 was considered economically specialized; (4) for the Location Quotient for Agriculture variable, a value of 2.31 or greater; and (5) for the Population Size variable, if the community was less than 5,000 people.

  The designation of a community being in a "ranching reliant" county was used: (1) to raise the threshold value for Market Score from 1.5 to 3.0; and (2) to raise the threshold value for Crop / Livestock Ratio from 1.5 to 4.

5. Criteria and how they were used to identify economic specialization within the Federal Government Employment Industry:

- Economic specialization for a community was identified if all 3 of these criteria were satisfied: (1) for the Location Quotient for Federal Government bvariable, a value of 1.21 or greater represents 5 percent or greater federal government employment when the nation is used as the reference region; (2) for the Population Size variable, a community with a population of less than 5,000 was considered economically specialized simply because of its size; and (3) for the Percent BLM-Forest Service Employment variable, if the percent was greater than 0. Percent BLM-Forest Service Employment was the ratio of the sum of BLM and Forest Service employees divided by the population of the community.

- Economic specialization for a community was identified if all 3 of these criteria were satisfied: (1) for the Percent BLM-Forest Service Employment variable, if the percent was greater than 0.04; (2) for the Population Size variable, if the community was less than 9,000; and (3) for the Location Quotient for Federal Government variable, if the value was greater than zero.

6. Convert the community-level economic specialization to subbasin-level economic specialization.
   a. Assign 1 point for each specialization (whether for wood products industry, ranching industry, or federal government employment industry), for each community that was identified as economically specialized. A community could be economically specialized in 1 or more of the 3 industries, so it could be assigned more than 1 point.
   b. By subbasin, sum the points for all the communities identified as economically specialized that are within the subbasin to create a subbasin economic specialization score.
   c. For subbasins that did not contain any communities identified as economically specialized, but are adjacent to subbasins that do, 0.5 point was assigned to them as their subbasin economic specialization score.
   d. By subbasin, take the economic specialization scores from step 6 (b and c) and normalize them. The greatest score was equated to 1.00, and all lesser scores were divided into the greatest score with the resulting quotient being their normalized score. Thus, subbasin quotients received normalized scores that ranged between 0 and 1.00.
   e. Normalized scores from step 6(d) that were $\geq$ 0.66 and $\leq$ 1.00 were rated as High Priority for economic restoration. Normalized scores of $\geq$ 0.33 and < 0.66 were rated as Moderate. Normalized scores of $\geq$ 0.05 and < 0.33 were rated as Low. Normalized scores of < 0.05 were rated as Very Low.
   f. Subbasins that did not contain any communities identified as economically specialized and were not assigned 0.5 point, were rated as "Not Identified."

Several premises and assumptions were followed in the development of Map 2-33:

- Communities identified as economically specialized were judged to be more economically susceptible to changes in federal land management policy compared with other communities. Communities identified as isolated were a subset of those identified as economically specialized, and their isolation was not used as a factor in determining economic specialization.
- Changes in the wood products, ranching, and federal (especially BLM-Forest Service) government employment industries are reasonably linked with these changes in federal land management policy.
- Land management policy would address land management goals without causing undue harm on economic and social institutions of the area encompassing communities identified as economically specialized. The land management emphasis is not to sustain the economic and social institutions of these communities at all costs, but rather to avoid adding to the strain that ongoing change is already exerting on these communities.
- For the wood products industry and the agriculture industry, employment of less than 5 percent was judged "not substantial enough" to justify identification of economic specialization.
- Because available data did not distinguish the livestock industry from agriculture: (1) the Crop / Livestock Ratio variable was developed to aid in determining the importance of livestock within the agriculture sector. The Crop / Livestock Ratio variable is a county-level variable based on the dollar value of these agricultural products; and (2) the Pasture / Farm Ratio variable was developed to aid in determining the importance of livestock within the agriculture sector. The Pasture / Farm Ratio variable is a county-level variable based on acres in each category. Pasture is assumed to reflect livestock industry importance.
- Because employment data made available to ICBEMP by Harris, Brown, and McLaughlin (1996) did not account for known BLM and Forest Service employment, the Percent BLM-Forest Service Employment variable was developed to better represent the contribution of BLM-Forest Service employment to community employment.
- Assignment of 0.5 point to subbasins that did not contain any communities identified as economically specialized, but were adjacent to subbasins that did, was done to represent the economic contribution that these adjacent subbasins are believed to have on economically specialized communities. This was admittedly a crude attempt to capture this economic contribution.

Summary: Map 2-33 shows the degree of economic specialization within subbasins of the project area. There are 59 communities identified as economically specialized in the wood products industry, 72 communities in the ranching industry, and 51 communities in the BLM-Forest Service government employment

industry, contained within High, Moderate, Low, or Very Low subbasins. The economically specialized communities were judged to be more economically susceptible to changes in federal land management policy compared with other communities. As subbasin ratings move from Very Low up to those rated High, the degree of economic susceptibility of that subbasin is projected to *increase*.

Broad-scale High Restoration Priority Subbasins (Alternative S2)

Map 3-8 has 14 components. The first thirteen components are subbasins that have a restoration priority influenced by biophysical, economically specialized communities, tribal, and/or aquatic resources. Component 14 includes the subbasins that were not distinguished at the broad scale for any particular restoration priority; these subbasins would not receive an allocation of potential additional funding (above base level) from ICBEMP.

Component:

1. *Biophysical, Economic, Tribal, Aquatic* (Upper Grande Ronde subbasin)
2. *Biophysical, Economic, Tribal* (Upper Coeur d*Alene subbasin)
3. *Biophysical, Economic, Aquatic* (Lower John Day, Upper John Day, Middle Fork John Day, and Goose Lake subbasins)
4. *Biophysical, Tribal, Aquatic* (Middle Columbia-Hood subbasin)
5. *Biophysical, Economic* (Middle Fork Payette, Upper Snake-Rock, Little Wood, and Beaver-Camas subbasins)
6. *Biophysical, Tribal* (Upper Malheur subbasin)
7. *Biophysical, Aquatic* (North Fork John Day subbasin)
8. *Economic, Tribal* (Lower Clark Fork and Middle Snake-Succor subbasins)
9. *Tribal, Aquatic* (Lower Deschutes, Clearwater, and Salt subbasins)
10. *Biophysical* (Trout, Upper Crooked, Lower Snake-Tucannon, and Medicine Lodge subbasins)
11. *Economic* (Lake Abert, Pend Oreille, and Upper Kootenai subbasins)
12. *Tribal* (Sanpoil and Priest subbasins)
13. *Aquatic* (Upper Yakima, Walla Walla, Lower Salmon, Little Salmon, South Fork Salmon, Upper Salmon, Upper North Fork Clearwater, Lochsa, Lower Selway, Swan, South Fork Boise, Pahsimeroi, and Palisades subbasins)
14. Subbasins not distinguished at the broad scale for any particular restoration priority (124 subbasins)

The steps involved in creating Map 3-8 and its components are:

1. By subbasin, sum the normalized scores for the subbasins in the Biophysical (that is, Aquatic, Water Quality, and Old Forest/Rangeland Habitat) Restoration Priority maps. There are 95 subbasins on the Aquatic, 41 subbasins on the Water Quality, and 48 Subbasins on the Old Forest/Rangeland Habitat map that have normalized scores which were summed for this step.
2. By subbasin, normalize the sums from step 1. Take the greatest sum and equate it to 1.00, and take all lesser sums and divide them into the greatest sum, with the resulting quotients being their normalized scores. Normalized scores thus range between 0 and 1.00.
3. Normalized scores from step 2 that were ≥ 0.66 and ≤ 1.00 were rated as High. Normalized scores of ≥ 0.33 and < 0.66 were rated as Moderate. Normalized scores of ≥ 0.05 and < 0.33 were rated as Low. Normalized scores of < 0.05 were rated as Very Low.
4. Select the subbasins rated either High or Moderate.
5. Apply the Landscape Restoration Priority map (Map 3-2) to the subbasins from step 4. Identify the subset of the subbasins from step 4 that overlap with the 53 subbasins rated either High or Moderate for Landscape Restoration Priority.
6. Use the 17 identified subbasins from step 5 to create the first cut of Map 3-8.
7. Select the subbasins from the Economic Restoration Priority map (Map 3-6) that are rated Moderate or High.
8. Apply the Landscape Restoration Priority map (Map 3-2) to the subbasins from step 7. Identify the subset of these subbasins that overlap with the 53 subbasins rated either High or Moderate for Landscape Restoration Priority.
9. Use the 21 subbasins from step 8 as a candidate pool. Of this candidate pool, identify the 10 subbasins that have already been identified in step 6 and identify the 11 subbasins that were not already identified in step 6.
10. Select a subset of the 11 subbasins from step 9 (Lake Abert, Middle Snake-Succor, Pend Oreille, and Upper Kootenai subbasins) and add them to Alternative S2 to make the second cut of Map 3-8. The four additional subbasins were selected to enhance the geographic distribution of economic restoration priorities (one from each of Oregon,

Washington, Idaho, and Montana). There are 21 subbasins on Map 3-8 after this step is completed.

11. Using the Tribal Restoration Priority map (Map 3-7), select the 16 subbasins that were rated Very High.
12. Apply the Landscape Restoration Priority map (Map 3-2) to these 16 subbasins. Identify the subset (10 subbasins) that overlaps with the 53 subbasins rated either High or Moderate for Landscape Restoration Priority.
13. Of these 10 subbasins from step 12, identify the subbasins that are not already included in the 21 subbasins from step 10. Add these to Map 3-8 to make the third cut which contains 26 subbasins.
14. Using the Aquatic Restoration Priority map (Map 3-3), select the 9 subbasins rated High, plus 14 of the 41 subbasins rated Moderate (these 14 subbasins were the top 1/3 of normalized scores within the Moderate category).
15. Add the 23 subbasins from step 14 that are not already included in the 26 subbasins from step 13 to make the fourth and final cut. The final Alternative S2 map contains 40 subbasins.

The 40 subbasins included in components 1 through 13 are characterized more fully in Table 1 and in the following discussion:

The restoration priority for 17 of the 40 subbasins was influenced by Biophysical (the combination of Aquatic, Water Quality, and Old Forest/Rangeland Habitat) needs. These 17 subbasins were included within components 1 through 7, and 10. They needed to satisfy two criteria to be selected: (1) they were rated highly for the combination of Aquatic, Water Quality, and Old Forest/Rangeland Habitat restoration priority, and (2) they were rated either High or Moderate for Landscape restoration priority.

The restoration priority for 15 of the 40 subbasins was influenced by Economically Specialized Communities (Map 2-33 and Map 3-6). These 15 subbasins were included within components 1, 2, 3, 5, 8, and 11. They were a subset of 21 subbasins that satisfied two criteria: (1) they were rated either high or Moderate for Economic Restoration Priority, and (2) they were either rated High or Moderate for Landscape restoration priority. Ten of the 15 subbasins were previously selected because of Biophysical needs. This left 11 subbasins remaining from the 21. With the twofold intent of (1) enhancing the geographic distribution of Economic Restoration Priority subbasins in the project area, while (2) providing comparatively *less* emphasis in the Alternative S2 map (Map 3-8) than in the Alternative S3 map (Map 3-9) for prioritizing restoration activities near economically specialized communities, only 4 of the remaining 11 subbasins were selected. The fifteenth subbasin was selected because of tribal needs, yet was already one of the 21 subbasins.

The restoration priority for 11 of the 40 subbasins was influenced by tribal needs. These 11 subbasins were included within components 1, 2, 4, 6, 8, 9, and 12. They were a subset of 16 subbasins that satisfied the first criterion of being rated Very High for Tribal restoration priority. Of the 11, 10 were selected because they satisfied the second criterion of being rated either High or Moderate for Landscape restoration priority. The eleventh subbasin was selected because of Aquatic needs, yet was already one of the 16 subbasins rated Very High for Tribal restoration priority.

The restoration priority for 23 of the 40 subbasins was influenced by Aquatic needs. These 23 subbasins were included within components 1, 3, 4, 7, 9, and 13. They satisfied the criterion of either being rated High for Aquatic restoration priority, or being in the top 1/3 of subbasins rated Moderate for Aquatic restoration priority (based on their normalized scores).

Summary of discussion of table: A set of 53 subbasins rated either High or Moderate for Landscape restoration priority were used to filter (1) the set of High and Moderate-rated Biophysical restoration priority subbasins, (2) the High and Moderate-rated Economic Restoration Priority subbasins, and (3) the Very High rated Tribal Restoration priority subbasins. Subsequent to the filtering, 17 subbasins were selected from the Biophysical Restoration priority subbasins, 21 subbasins from the Economic Restoration Priority subbasins, and 10 subbasins from the Tribal Restoration priority subbasins. The set of High or Moderate-rated Landscape Restoration priority subbasins was the most influential factor (based on number of subbasins) on subbasin selection, with Aquatic restoration being the second most influential factor. (Note: 13 of the 23 Aquatic restoration priority subbasins that were selected were not rated High or Moderate for Landscape restoration priority.)

Table 1. Alternative S2: Broad-scale High Restoration Priority Subbasins (Map 3-8).

Component	Number of Subbasins (Total = 40)	Landscape Restoration Priority: Subbasins Rated High (Total = 18)	Subbasins Rated Moderate (Total = 9)	Subbasins Rated Low (Total = 13)
1. Biophysical + Economically Specialized + Tribal + Aquatic	1	1	0	0
2. Biophysical + Economically Specialized + Tribal	1	1	0	0
3. Biophysical + Economically Specialized + Aquatic	4	3	1	0
4. Biophysical + Tribal + Aquatic	1	1	0	0
5. Biophysical + Economically Specialized	4	2	2	0
6. Biophysical + Tribal	1	0	1	0
7. Biophysical + Aquatic	1	1	0	0
8. Economically Specialized + Tribal	2	1	1	0
9. Tribal + Aquatic	3	1	1	1
10. Biophysical	4	3	1	0
11. Economically Specialized	3	2	1	0
12. Tribal	2	1	1	0
13. Aquatic	13	1[1]	0	12[2]

[1]Moderate landscape risk and High landscape opportunity.

[2]Five subbasins had either Moderate or High landscape risk and Low landscape opportunity; seven subbasins had Low landscape risk and Low landscape opportunity.

Broad-scale High Restoration Priority Subbasins (Alternative S3)

Map 3-9 has 14 components. The first 13 components are subbasins that have a restoration priority influenced by one or more of biophysical, economically specialized communities, tribal, and aquatic needs. Component 14 includes the subbasins that were not distinguished at the broad scale for any particular restoration priority, and these subbasins would not receive an allocation of potential additional funding (above base level) from ICBEMP.

Component:

1. *Biophysical, Economic, Tribal, Aquatic* (Upper Grande Ronde subbasin)
2. *Biophysical, Economic, Tribal* (Upper Coeur d*Alene subbasin)
3. *Biophysical, Economic, Aquatic* (Lower John Day, Upper John Day, Middle Fork John Day, and Goose Lake subbasins)
4. *Biophysical, Tribal, Aquatic* (Middle Columbia-Hood subbasin)
5. *Biophysical, Economic* (Middle Fork Payette, Upper Snake-Rock, Little Wood, and Beaver-Camas subbasins)
6. *Biophysical, Tribal* (Upper Malheur subbasin)
7. *Biophysical, Aquatic* (North Fork John Day subbasin)
8. *Economic, Tribal* (Lower Clark Fork and Middle Snake-Succor subbasins)
9. *Tribal, Aquatic* (Lower Deschutes, Clearwater, and Salt subbasins)
10. *Biophysical* (Trout, Upper Crooked, Lower Snake-Tucannon, and Medicine Lodge subbasins)
11. *Economic* (Lake Abert, Lower Malheur, Pend Oreille, Moyie, Yaak, Upper Kootenai, Boise-Mores, Big Lost, and Idaho Falls subbasins)
12. *Tribal* (Sprague, Upper Spokane, Sanpoil, Priest, Lower Kootenai, North Fork Flathead, and Blackfoot subbasins)
13. *Aquatic* (Upper Yakima, Walla Walla, Lower Salmon, Little Salmon, South Fork Salmon, Upper Salmon, Upper North Fork Clearwater, Lochsa, Lower Selway, Swan, South Fork Boise, Pahsimeroi, and Palisades subbasins)
14. Subbasins not distinguished at the broad scale for any particular restoration priority (contains 113 subbasins).

Steps 1 through 9 were the same for Map 3-9 (Alternative S3) as for Map 3-8 (Alternative S2). The remaining steps (steps 10 through 14) involved in creating Map 3-9 and its components are:

10. Select all of the 11 subbasins from step 9 and add them to Alternative S3 to make the second cut of Map 3-9. This was done to increase the number of Economic Restoration Priority subbasins, to be consistent with the theme of Alternative S3, which stresses that areas near economically specialized communities would be prioritized for restoration activities. There are 28 subbasins on Map 3-9 after this step is completed.
11. Using the Tribal Restoration Priority map (Map 3-7), select the 16 subbasins that were rated Very High.
12. Add the 16 subbasins that are not already included in the 28 subbasins from step 10, to Map 3-9 to make the third cut. This was done to add to the number of Tribal Restoration Priority subbasins in Alternative S2 to be consistent with the theme of Alternative S3, which emphasizes prioritizing restoration activities near economically specialized communities as well as Tribal communities. This third cut of Map 3-9 contains 38 subbasins.
13. Using the Aquatic Restoration Priority map (Map 3-3), select the 9 subbasins rated High, plus 14 of the 41 subbasins rated Moderate (these 14 subbasins were the top 1/3 of normalized scores within the Moderate category).
14. Add the 23 subbasins from step 13 not already included in the 38 subbasins from step 12, to make the fourth and final cut of Map 3-9. The final Alternative S3 map contains 51 subbasins.

The 51 subbasins included in Components 1 through 13 are characterized more fully in Table 2 and the following discussion:

The restoration priority for 17 of the 51 subbasins was influenced by Biophysical (the combination of Aquatic, Water Quality, and Old Forest/Rangeland Habitat) needs. These 17 subbasins were included within components 1 through 7, and 10. They needed to satisfy two criteria to be selected: (1) they were rated highly for the combination of Aquatic restoration priority, Water Quality restoration priority, and Old Forest/Rangeland Habitat restoration priority, and (2) they were rated either High or Moderate for Landscape restoration priority.

The restoration priority for 21 of the 51 subbasins was influenced by Economically Specialized Communities. These 21 subbasins were included within components 1, 2, 3, 5, 8, and 11. They satisfied two

Table 2. Alternative S3: Broad-scale High Restoration Priority Subbasins (Map 3-9).

Component	Number of Subbasins (Total = 51)	Landscape Restoration Priority: Subbasins Rated High (Total = 20)	Subbasins Rated Moderate (Total = 13)	Subbasins Rated Low (Total = 18)
1. Biophysical + Economically Specialized + Tribal + Aquatic	1	1	0	0
2. Biophysical + Economically Specialized + Tribal	1	1	0	0
3. Biophysical + Economically Specialized + Aquatic	4	3	1	0
4. Biophysical + Tribal + Aquatic	1	1	0	0
5. Biophysical + Economically Specialized	4	2	2	0
6. Biophysical + Tribal	1	0	1	0
7. Biophysical + Aquatic	1	1	0	0
8. Economically Specialized + Tribal	2	1	1	0
9. Tribal + Aquatic	3	1	1	1
10. Biophysical	4	3	1	0
11. Economically Specialized	9	4	5	0
12. Tribal	7	1	1	5
13. Aquatic	13	1[1]	0	12[2]

[1]Moderate landscape risk and High landscape opportunity.

[2]Five subbasins had either Moderate or High landscape risk and Low landscape opportunity; seven subbasins had Low landscape risk and Low landscape opportunity.

criteria: (1) they were rated either High or Moderate for Economic Restoration Priority, and (2) they were rated either High or Moderate for Landscape restoration priority. Ten of the 21 were previously selected because of Biophysical needs. The remaining 11 were selected to (1) enhance the geographic distribution of Economic Restoration Priority subbasins in the project area, while (2) providing comparatively *more* emphasis on the Alternative S3 map (Map 3-9) than on the Alternative S2 map (Map 3-8) for prioritizing restoration activities near economically specialized communities.

The restoration priority for 16 of the 51 subbasins was influenced by Tribal needs. These 16 subbasins were included within components 1, 2, 4, 6, 8, 9, and 12. They satisfied the criterion of being rated Very High for Tribal restoration priority.

The restoration priority for 23 of the 51 subbasins was influenced by Aquatic needs. These 23 subbasins were included within components 1, 3, 4, 7, 9, and 13. They satisfied the criterion of either being rated High for Aquatic restoration priority, or being in the top 1/3 of subbasins rated Moderate for Aquatic restoration priority (based on their normalized scores).

Summary of discussion of table: A set of 53 subbasins rated either High or Moderate for Landscape restoration priority were used to filter (1) the set of High and Moderate-rated Biophysical restoration priority subbasins, and (2) the High and Moderate-rated Economic Restoration Priority subbasins. Subsequent to the filtering, 17 subbasins were selected from the Biophysical Restoration priority subbasins, and 21 subbasins were selected from the Economic Restoration Priority subbasins. The set of High or Moderate-rated Landscape Restoration priority subbasins was the most influential factor (based on number of subbasins) on subbasin selection, with Economic restoration, Tribal restoration, and Aquatic restoration being secondary factors. (Note: 6 of the 16 Tribal and 13 of the 23 Aquatic restoration priority subbasins that were selected were not rated High or Moderate for Landscape restoration priority.)

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