ECOSYSTEM INTEGRITY

The previous sections described existing conditions and trends from a variety of resource perspectives. This section describes the overall status of Basin ecosystems by combining that information to evaluate ecosystem integrity—the degree to which all ecosystem components and their interactions are represented, functioning, and able to renew themselves. The integrity of ecosystems encompasses both social and biophysical components; the health of the Basin's people and economy are not a separate issue from the health and integrity of other ecosystem components. Maintaining the integrity of ecosystems is assumed to be the overriding goal of ecosystem management.

Ecological integrity refers to the presence and functioning of ecological components and processes. The basic components of ecological integrity include the forest, range, and aquatic systems with a hydrologic system that overlays the landscape as a whole. The counterpart to ecological integrity in social and economic terms is resiliency (measured at the county level), which in the context of ecosystem management reflects the interests of people to maintain well-being through personal and community transitions.

Following is an overview of the integrity of systems in the Basin. Based on the data sets and analysis conducted through the project, each of the 164 subbasins (averaging approximately 900,000 acres each) was rated based on their relative differences, as having high, medium, and low ecological integrity for forestlands, rangelands, forestland hydrology, rangeland hydrology, and aquatic systems. This analysis included all ownerships within the Basin.

These integrity and resiliency ratings are initial estimates based on available information and on broad proxies for various processes. Some of the proxies for ecological measures, for example, reflect structure rather than the underlying process. These represent the best approximations at this broad extent for the underlying processes available at this time. Absolute levels of integrity or resiliency within the Basin have not been measured. Rather, these ratings represent the first attempt at estimating integrity and resiliency at this spatial level and undoubtedly will be refined as additional information becomes available.

Ecological Integrity

A terrestrial system that exhibits high integrity is a mosaic of plant and animal communities consisting of well-connected, high-quality habitats that support a diverse assemblage of native and desired non-native species, the full expression of potential life histories and taxonomic lineages, and the taxonomic and genetic diversity necessary for long-term persistence and adaptation in a variable environment. Areas exhibiting the most elements of a system with high integrity were rated as "high" and those with the fewest elements were rated "low"; the "medium" rating fell in between.

Forestland integrity ratings were estimated for each subbasin if the forested vegetation component was at least 20 percent of the area of the subbasin, while rangeland integrity ratings were estimated if the rangeland potential vegetation types within a subbasin comprised at least 20 percent of the area of the subbasin. This resulted in 112 subbasins with a forest integrity rating, 86 subbasins with range integrity ratings, and 39 subbasins rated for both.

Forestland Integrity**—**Measures of forestland integrity include such elements as: (1) consistency of tree stocking levels with long-term disturbances typical for the forest types present, (2) the amount and distribution of exotic species, (3) the amount of snags and down woody material present, (4) disruptions to the hydrologic regimes, (5) the absence or presence of wildfire and its effect on the composition and patterns of forest types, and, (6) changes in fire severity and frequency from historical (pre-1800s) to the present.

Rangeland Integrity**—**Measures of rangeland integrity include such elements as: (1) grazing influences on vegetation patterns and composition, (2) disruptions to the hydrologic regimes, (3) expansion of exotic species, (4) changes in fire severity and frequency, (5) increases in bare soils, and (6) expansion of woodlands into herblands and shrublands.

Hydrologic Integrity**—**A hydrologic system that exhibits high integrity is a network of streams, along with their ground water ecosystems, within the broader landscape where the upland, floodplain, and riparian areas have resilient vegetation, where capture, storage, and release of water limits the effects of sedimentation and erosion, and where infiltration, percolation, and nutrient cycling provide for diverse and productive aquatic and terrestrial environments. Due to a lack of consistent data on stream characteristics such as width, depth, and streambed materials and arrangement, hydrologic integrity was estimated based on disturbance sensitivity and recovery potential of watersheds, plus the amount and type of past disturbance.

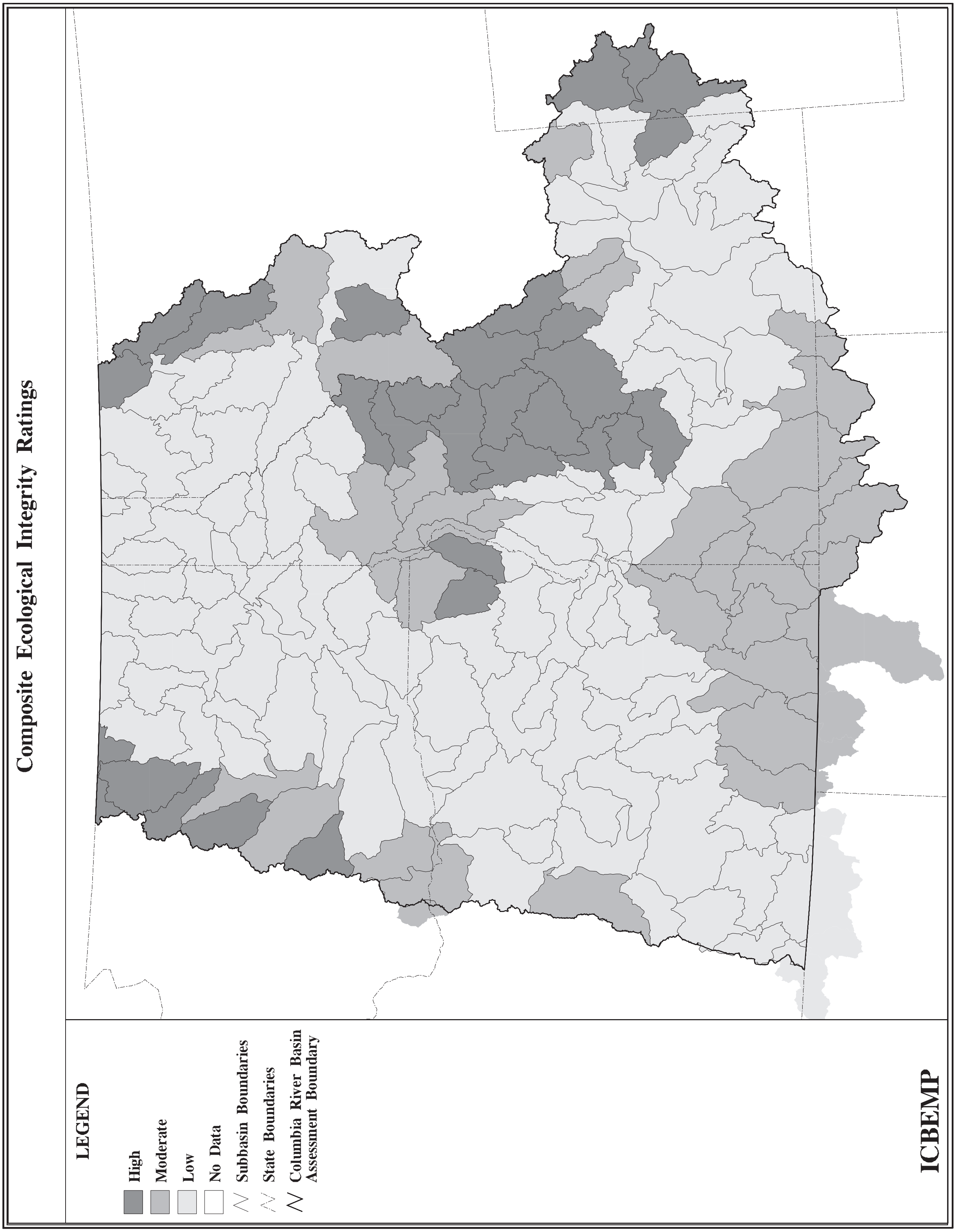
Watersheds with high impact (disturbance) and low recovery potential have higher probabilities of containing altered hydrologic functions than other areas, and are consequently classified as low integrity. Conversely, areas with low relative effect from mining, dams, roads, cropland conversion, and grazing and which also have high recovery potentials are considered to have the highest probable hydrologic integrity.

Aquatic Integrity**—**An aquatic system that exhibits high integrity has a mosaic of well-connected, high-quality water and habitats that support a diverse assemblage of native and desired non-native species, the full expression of potential life histories and dispersal mechanisms, and the genetic diversity necessary for long-term persistence and adaptation in a variable environment. Subbasins exhibiting the greatest level of these characteristics were rated high, those exhibiting the least were rated low, with medium ratings in between.

Terrestrial Community Types**—**The counterpart for estimating the integrity of terrestrial habitat was developed by comparing pre-Euro-American settlement conditions with those existing today. The resulting departure values show how much each subbasin has undergone broad-scale habitat changes in forest and rangelands. Risk to species persistence was assumed to increase substantially when the availability of current habitat fell below 75 percent of that available historically.







Map 18—Composite ecological integrity ratings.

Composite Ecological Integrity

The five component integrity ratings (forestland, rangeland, forest and rangeland hydrologic, and aquatic systems), along with other information collected by the project, were used to develop an overall estimate of ecological integrity of each subbasin. Composite integrity was estimated by comparing the component integrity ratings and knowledge of actual on-the-ground conditions. Currently, 16 percent of the Basin falls in the relatively high class, 24 percent in the moderate, and 60 percent in the low ecological integrity class (figure 11; map 18).

Much of this low category includes lands used for agriculture and grazing; a low rating does not imply low productivity. The rating system emphasizes ecological processes and functions and thus has a tendency to rate human-altered systems lower than systems dominated by more natural processes. Eighty-four percent of the systems with high integrity are on FS- and BLM-administered lands while 39 percent of the low integrity systems are on FS- and BLM-administered lands.

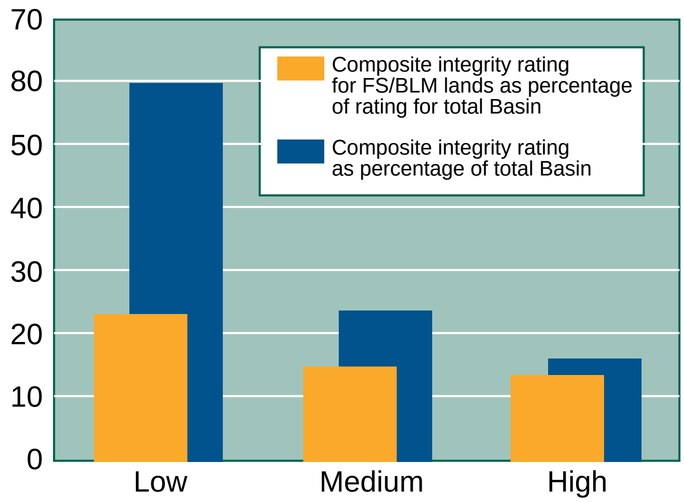


Figure 11—Integrity Basinwide and for FS- BLM-administered lands.

Currently, 16 percent of the Basin falls in the relatively high class, 24 percent in the moderate, and 60 percent in the low ecological integrity class.

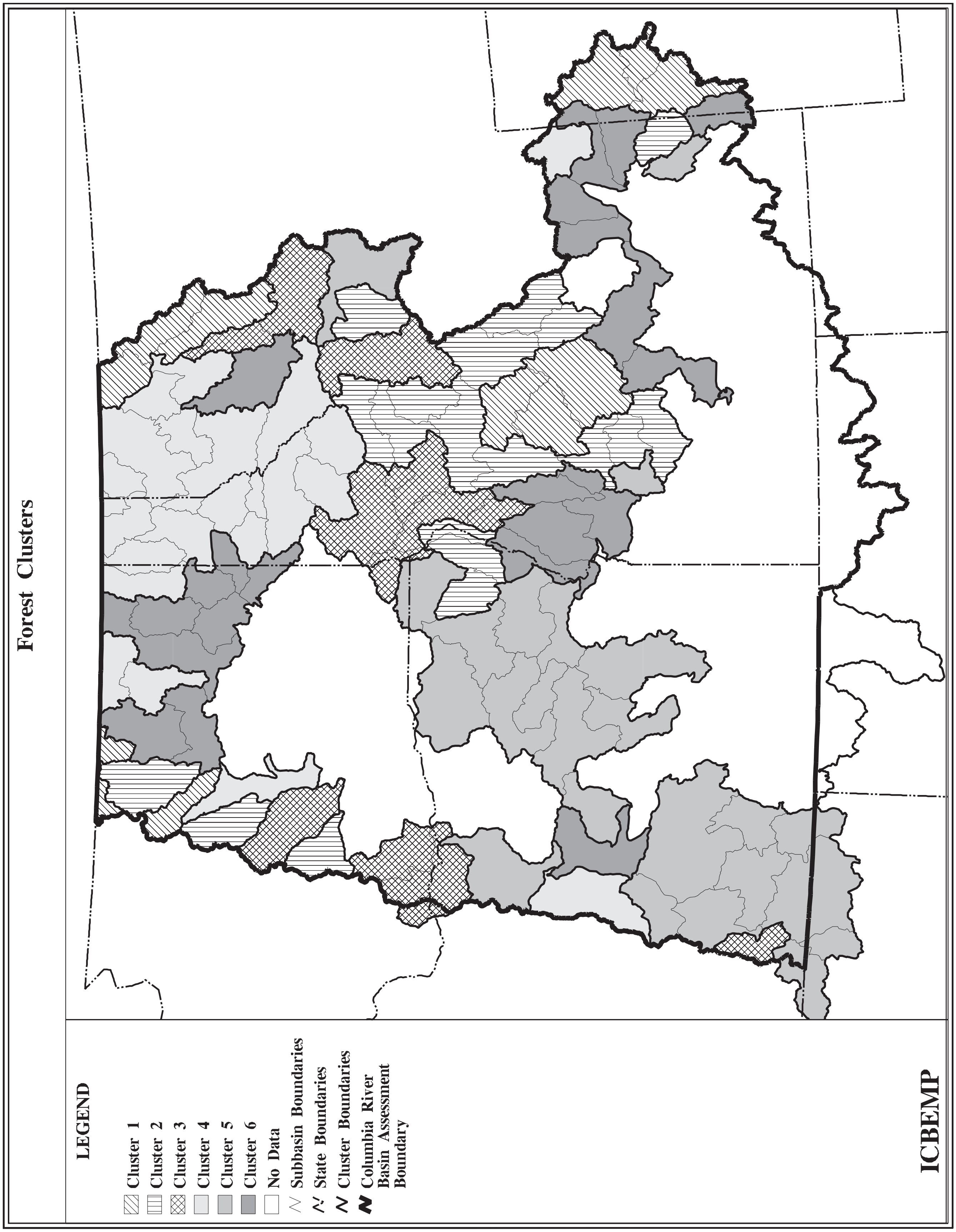
While this information is useful from a Basin-wide perspective, it does not describe what geographic areas of the Basin have higher or lower integrity. For this reason, subbasins were examined to determine whether they clustered into groups with common conditions, risks, and opportunities. This analysis was conducted separately for forested landscapes and non-forested (range) landscapes; some subbasins contain both range and forested landscapes, which may be in very different ecological condition.

For the cluster analysis, conditions within forest clusters and range clusters are summarized for the entire landscape, including both terrestrial and aquatic components. Within any cluster, the predominant conditions are an average —some locations within the cluster may have specific conditions that are better or worse than indicated.

***Forest Clusters*—**Subbasins with at least 20 percent of their area composed of dry forest, moist forest, or cold forest potential vegetation groups were classified as forest clusters. Relations among variables reflecting vegetative conditions, hydrologic sensitivity, and human-caused disturbance of native forests were studied to identify dominant patterns and differences. What emerged were six forest "clusters" of subbasins with similar conditions (map 19). Table 7 shows some of the key characteristics of each cluster.

Subbasins in Forest Cluster 1 represent those that are most intact ecologically, with the least loss of integrity in both forest and aquatic ecosystems. They are predominantly high elevation and tend to be dominated by Wilderness or roadless areas, and by cold, or moist and cold forests.

Subbasins in Forest Cluster 2 have a mix of areas of moderate-to-high forest and aquatic integrity. Moderate to large blocks of Wilderness or roadless areas and cold or moist forests are associated with the best conditions. Roaded non-wilderness areas and dry and moist forests



Map 19—Subbasins grouped in Forest Clusters.

Table 7—Summary of Characteristics of Forest Clusters (all lands).

Variable	Forest Cluster 1	2	3	4	5	6
	percent of area					
Ownership						
BLM/FS	80	86	40	58	50	35
Other	20	14	60	42	50	65
Potential Vegetation Groups						
Dry Forest	13	26	22	14	43	23
Moist Forest	23	25	33	67	6	16
Cold Forest	47	30	15	7	4	9
Dry Grass/Shrub	7	11	6	3	24	15
Cool Shrub	3	3	1	1	8	11
Other	8	5	24	8	15	26
Forested Vegetation Groups (% of forested area in each)						
Dry Forest	16	37	55	18	81	51
Moist Forest	27	27	52	73	11	21
Cold Forest	57	36	13	9	8	28
Road Density Classes						
Low or none	85	62	32	20	22	36
Moderate or higher	15	38	68	80	78	64
Cropland/pasture	0	3	20	2	11	21
<12" annual precipitation	1	4	2	3	14	14
Fire frequency change	37	60	66	51	60	60
Fire severity increase	36	50	57	47	35	36
High wildland/urban fire interface risk	0	17	6	1	29	10
Moderate wildland/urban fire interface risk	29	61	36	13	30	23
Change in juniper woodland	0	0	0	0	0	0
Forest Integrity						
Low	0	10	67	86	79	59
Moderate	0	43	33	10	21	17
High	100	47	0	4	0	24
Range Integrity						
Low	0	29	100	57	100	66
Moderate	61	48	0	43	0	35
High	40	23	0	0	0	0
Aquatic Integrity						
Low	5	0	8	54	52	87
Moderate	38	59	85	46	44	13
High	58	41	7	0	4	0
Hydrologic Integrity						
Low	0	4	47	12	39	76
Moderate	4	30	49	54	41	17
High	96	66	4	34	20	7
Composite Ecological Integrity						
Low	0	0	4	83	96	100
Moderate	0	3	96	17	4	0
High	100	97	0	0	0	0

Source: ICBEMP GIS data (converted to 1 km^2 raster data).

often coincide with more altered vegetation conditions.

Subbasins in Forest Cluster 3 are represented by aquatic ecosystems that are in relatively good condition, but have forests that are in highly altered and poor condition. Wilderness or roadless areas play a relatively insignificant role, and roading is moderate to extensive. Forests in this cluster are dominated by moist and dry forest potential vegetation groups. The moderately to highly productive forests in this cluster appear to have substantially changed structure, composition, and fire regime.

Moist Forest. Relatively healthy, diverse, open stand of western larch, Douglas-fir, and grand fir. There is almost no western white pine because of the effects of blister rust. Restoration would likely try to increase the amount of western white pine and manage for these types of vegetation structures.

Subbasins in Forest Cluster 4 have relatively low forest integrity and low or moderate aquatic integrity. The highly altered forests are mostly composed of the productive moist forest potential vegetation group. They tend to have the highest road densities in the project area, with few Wildernesses or roadless areas.

Subbasins in Forest Cluster 5 have low forest integrity and low or moderate aquatic integrity. Forest Cluster 5 is dominated by dry forests that are extensively roaded and have little, if any, Wilderness. Forest structure and composition have been substantially altered from historical conditions. These subbasins show large changes in fire frequency but less change in fire severity.

Subbasins in Forest Cluster 6 are in relatively poor condition from both a forest and an aquatic perspective, with especially fragmented aquatic systems and the lowest hydrologic integrity of any forest cluster. Forests in this cluster are composed

Moist Forest. Relatively unhealthy, closed stand of Douglas-fir and grand fir. Because of dominance by shade tolerant species that are susceptible to mortality from insects and disease, these stands are at high risk. They also are dense and have high accumulations of down, woody fuels and deep litter/duff layers. Consequently they are at risk for intense fires. Because the pattern is continuous the fires can be extensive and large.

Dry forest. Unhealthy forest with multiple layers and large, down dead fuels and deep litter and duff cover. The lower layers of small shade tolerant trees are susceptible to insect, disease and stress mortality. They provide a ladder that will carry fires into the crowns of the scattered large trees. Ecosystem management treatments would likely harvest the smaller trees in the overstory and understory, and use prescribed fire to change the character of the forest to look like the next photo.

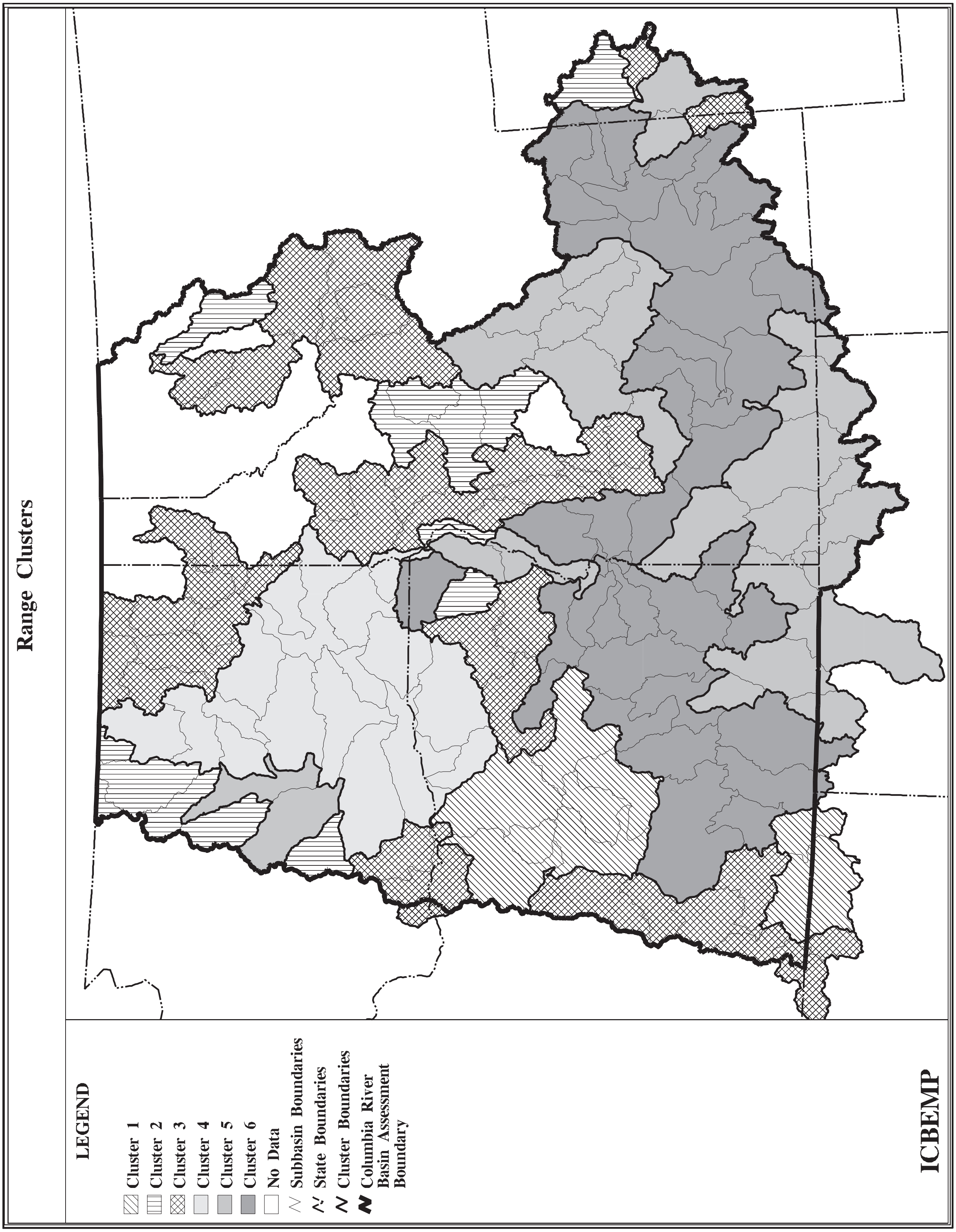
of a variety of dry, moist, and cold forest potential vegetation groups. Subbasins are heavily roaded with little, if any, Wilderness or roadless areas.

Range Clusters—Selected subbasins that historically had at least 20 percent of their area comprising dry grass, dry or cool shrub, woodland, and dry forest potential vegetation groups were classified as range clusters. Relations among variables reflecting vegetative conditions, hydrologic sensitivity, and human-caused disturbance were also used in a way similar, but not identical, to that used for forest clusters. Range cluster analysis identified dominant patterns and differences between subsets of these variables. Six range clusters emerged, where subbasins within clusters were more like each other than subbasins in other clusters (map 20). Table 8 summarizes some of the key characteristics of each range cluster.

Rangeland and aquatic integrity are low to moderate in Range Cluster 1, which is distinguished by large areas of western juniper woodland. These subbasins have high road densities and little area in Wilderness or unroaded categories. Over half the area is managed in range allotments.

Rangeland and aquatic integrity are high in Range Cluster 2. There are large blocks of Wilderness and minimally roaded areas. These dry, forested ranges are generally in the lower elevations and have little area managed as range allotments.

Dry forest. Healthy forest with single layer of large trees, few large down logs, grass understory, and shallow layer of litter and duff. Trees are vigorous because there is little competition for moisture and nutrients between trees. When fires occur in this stand they generally burn with low intensity, in the grass fuels, and do not burn in the crown.



Map 20—Subbasins grouped in Range Clusters.

Table 8— Summary of characteristics of Range Clusters.

Variable	Range Cluster 1	2	3	4	5	6
	percent of area					
Ownership						
BLM/FS	36	81	44	5	75	55
Other	64	19	56	95	25	45
Potential Vegetation Groups						
Dry Forest	29	21	34	8	10	12
Moist Forest	5	33	28	4	5	2
Cold Forest	1	34	14	30	11	4
Dry Grass/Shrub	32	4	4	26	45	50
Cool Shrub	22	1	2	3	20	9
Other	11	7	18	59	9	23
Rangeland Vegetation Groups						
Dry Rangeland	49	34	17	30	61	61
Cool Rangeland	34	8	8	3	27	11
Other	17	58	75	67	12	28
Road Density Classes						
Low or none	20	71	30	62	64	30
Moderate or higher	80	29	70	38	36	70
Cropland/pasture	9	3	14	56	5	17
<12" annual precipitation	23	1	2	51	33	38
Fire frequency change	37	51	67	17	24	17
Fire severity increase	18	47	49	13	16	9
High wildland/urban fire risk interface	32	7	12	0	6	8
Moderate wildland/urban fire risk interface	10	59	33	4	58	39
Change in juniper woodland	+ 12	0	0	0	0	0
Forest Integrity						
Low	100	6	76	79	12	37
Moderate	0	37	15	21	27	43
High	0	57	9	0	61	20
Range Integrity						
Low	100	6	76	100	26	79
Moderate	0	37	15	0	50	21
High	0	57	9	0	24	0
Aquatic Integrity						
Low	39	4	43	84	37	79
Moderate	61	24	50	16	57	18
High	0	72	7	0	6	3
Hydrologic Integrity						
Low	34	6	49	100	7	44
Moderate	66	16	35	0	35	34
High	0	78	16	0	58	22
Composite Ecological Integrity						
Low	100	0	58	97	8	80
Moderate	0	3	32	3	63	20
High	0	97	10	0	29	0

Source: ICBEMP GIS data (converted to 1 km^2 raster data).

Dry, forested ranges in Range Cluster 3 have moderate rangeland integrity and mixed aquatic integrity. These subbasins contain little or no Wilderness or roadless areas. Less than half of the subbasins are managed as public land range allotments. These subbasins are among the most altered forested rangelands of the project area.

Subbasins in Range Cluster 4 have the lowest rangeland and aquatic integrity of all rangelands in the project area. There are no Wildernesses or roadless areas, and range allotments on public lands are minimal. Subbasins in this cluster are distinguished from other clusters because they are composed primarily of cropland and pasture.

Healthy riparian area with relatively dense cover of herb and shrub vegetation along the stream banks and on the adjacent terraces. This system is resilient, has high capacity to store water, and is a buffer for flood events.

Subbasins in Range Cluster 5 are composed of upland shrublands with moderate integrity and mixed aquatic integrity. These subbasins represent the bulk of the high-elevation ranges. They are less developed, less roaded, more remote, and tend to be less disturbed by agricultural conversion or grazing than cropland-dominated subbasins.

Both rangeland and aquatic integrity are low in Range Cluster 6 subbasins. The dry shrubland potential vegetation group dominates upland shrublands. Road densities are relatively high. Most rangelands on public lands in this cluster are managed as range allotments.

In summary, table 9 highlights the risks to ecological integrity and opportunities to address risks for each of the forest and range clusters.

Unhealthy riparian area with relatively low cover of herb vegetation along the stream banks and on the adjacent terraces. Effects of summer season historic livestock grazing caused the loss of shrubs and compacted the surface soil. The stream cut down in the channel and the water table dropped resulting in a dryer system. This system is less productive, less diverse, will not store as much water, and has low buffering capacity during flood events.

Table 9—Forest Clusters - primary characteristics, risks to ecological integrity, and opportunities to address risks to integrity.

Forest Clusters	Primary characteristics	Primary risks to ecological integrity	Primary opportunities to address risks to integrity
Forest 1	1. Moist and Cold Forest types 2. Minimally roaded 3. High aquatic, forest, hydrologic, and composite integrity	1. Severe fire potential in lower elevations 2. Higher elevations sensitive to soil disturbances (i.e., roading)	1. Prescription of natural or prescribed fire to reduce risks of severe fire 2. Reduction of stocking levels in lower elevations - reductions of fire severity. Maintenance of integrity in higher eleva tions
Forest 2	1. Minimally roaded 2. Mix of high and moderate forest, hydrologic, and aquatic integrity 3. High composite integrity 4. Mix of cold, moist, and dry forest types (nearly equal)	1. Cold forest types sensitive to soil disturbance (i.e., roading) 2. Fire severity in lower elevations and dry forest types 3. Aquatic integrity induced by low forest integrity in dry and moist forest types	1. Reduction of fire threat in lower elevations and manage road densities 2. Improvement of aquatic integrity through improving connectivity 3. Reduction of fire severity through restoration practices
Forest 3	1. Moderately roaded 2. Moderate aquatic and composite integrity 3. Low and moderate forest and hydrologic integrity 4. Dry and moist forest types	1. Fire severity in dry/moist forest types 2. Aquatic integrity at risk in areas of high fire potential 3. Old/late forest structures in managed areas	1. Restoration of forest integrity 2. Maintenance of aquatic and hydrologic integrity 3. Management of road densities
Forest 4	1. Moist forest types 2. Highly roaded 3. Low forest, aquatic, and composite integrity 4. Moderate to high hydro-logic integrity	1. Hydrologic and aquatic systems from fire potentials 2. Late and old forest structures in managed areas 3. Forest compositions - susceptibility to insect, disease, and fire	1. Restoratoion of late and old forest structure in managed areas 2. Connection of aquatic strongholds through restoration 3. Treatment of forested areas to reduce fire, insect, and disease susceptibility
Forest 5	1. Dry forest types 2. Low to moderate aquatic integrity and low forest integrity and low composite integrity 3. Sensitive watersheds to disturbance 4. Highly roaded	1. Fish strongholds from sediment/erosion potential 2. Forest composition and structure, especially old/late 3. Hydrologic integrity due to fire severity and frequency	1. Restoration of forest integrity through vegetation management 2. Restoration of old/late forest structure 3. Restoration of aquatic and hydrologic integrity by reducing risk of fire, insect, and disease and road management
Forest 6	1. Dry forest types 2. Low hydrologic, forest, aquatic, and composite integrity 3. Moderately roaded	1. Forest composition and structures especially old/late 2. Primarily present at finer resolutions	1. Restoration of forest structures 2. Maintenance of the scattered aquatic strong-holds that exist 3. Reduction of risk of fire, insect, and disease

Table 9 (continued)—Rangeland Clusters - primary characteristics, risks to ecological integrity, and opportunities to address risks to integrity.

Range Clusters	Primary characteristics	Primary risks to ecological integrity	Primary opportunities to address risks to integrity
Range 1	1. Highest level of juniper woodlands 2. High road densities 3. Low forest, range, and composite integrity 4. Moderate aquatic and hydrologic integrity 5. Fire regimes are more severe	1. Juniper encroachment into shrubland 2. Forage for ungulates (wild/domestic) reduced through woodland encroachment 3. Noxious weed expansion	1. Reduction of forest stocking could improve forage/cover relationships for livestock and big game 2. Curtailment of juniper expansion 3. Curtailment of noxious weed expansion 4. Management of riparian areas to enhance stream bank stability and riparian vegetation
Range 2	1. Forested rangelands in moderate to high integrity 2. High aquatic, hydrologic, and composite integrity 3. Minimally roaded	1. Fish and aquatic systems from dry vegetation types with fire severity/frequency changes 2. Dry forest types - especially late/old structures 3. Aquatic system sensitivity to disturbance	1. Restoration of vegeta tion and fuels treatments in dry forest types 2. Maintenance of aquatic and hydrologic integrity - emphasize connectivity 3. Restoration of mainte nance sagebrush ecotone 4. Restoration of forage production in winter range
Range 3	1. Low forest and range integrity 2. Low and moderate hydrologic, aquatic, and composite integrity 3. Highly roaded	1. Conflicts with big game management from conifer invasion reducing forage 2. Elevated fuel and fire from conifer invasion 3. Riparian conditions from disturbances 4. Increased susceptibility to insect, disease, and fire in forested areas	1. Management of to restore/ maintain riparian conditions 2. Prescription of fire to reduce risks from fire, insect, and disease in forested areas 3. Containment of noxious weeds 4. Maintenance of water quality for native and desired non-native fish
Range 4	1. Very low levels of FS/BLM lands 2. Lowest integrity in all components 3. Low levels of residual rangeland	1. Reduced fish habitat and populations from agricultural conversions	1. Reduction of threats to local populations of fish and their habitat
Range 5	1. Minimally roaded 2. Low croplands and other disturbances 3. High hydrologic and forest integrity 4. Moderate and low range and aquatic integrity 5. Moderate and high composite integrity	1. Continued declines in herb-land and shrubland habitats 2. Risks to local populations and habitats for fish	1. Maintenance restoration of riparian condition 2. Restoration of productive aquatic areas 3. Conservation of fish strongholds and unique aquatic areas
Range 6	1. Highly roaded 2. Highly altered from grazing and fire exclusion 3. High exotic species 4. Low composite integrity	1. Continued declines in herb-land and shrubland 2. Dry shrubland highly sensitive to overgrazing and exotic grass and forb invasion	1. Containment of exotic weed expansion 2. Maintenance restoration of riparian conditions 3. Management of grazing intensity, duration, and timing 4. Conservation of fish strongholds and unique aquatic areas

Much like the biophysical components of the ecosystem, social and economic resiliency are affected by the size of the area measured (such as community, county, or trade region).

Social and Economic Resiliency

Socioeconomic resiliency, estimated at the county level for this analysis, deals with the adaptability of human systems. High ratings imply that these systems are highly adaptable; changes in one aspect are quickly offset by self-correcting changes in other sectors or aspects. High levels of socioeconomic resiliency should reflect communities and economies that are adaptable to change, where "sense of place" is recognized in management actions, and where the mix of goods, functions, and services that society wants from ecosystems is maintained.

Much like the biophysical components of the ecosystem, social and economic resiliency are affected by the size of the area measured (such as community, county, or trade region) but reflect human notions of the landscape rather than hydrologic subbasins. In general, larger units display greater economic diversity (and by extension, economic and social resiliency) than smaller areas.

Economic Resiliency—This was measured by the diversity among employment sectors. The assumption is that people in high resiliency counties have ready access to a range of employment opportunities if specific firms or business sectors experience downturns. Little variation in economic diversity is found across the Basin at the scale of BEA regions. The relatively high levels of diversity (0.80 average on a scale of 1.0) at this scale reflect rapid growth in the Basin since the mid 1980s. Furthermore, the economy of the Basin has shown resistance to national recessions except when they greatly affect the agricultural sector. The highest resiliency ratings are for the Boise, Idaho Falls, Missoula, and Spokane BEA regions.

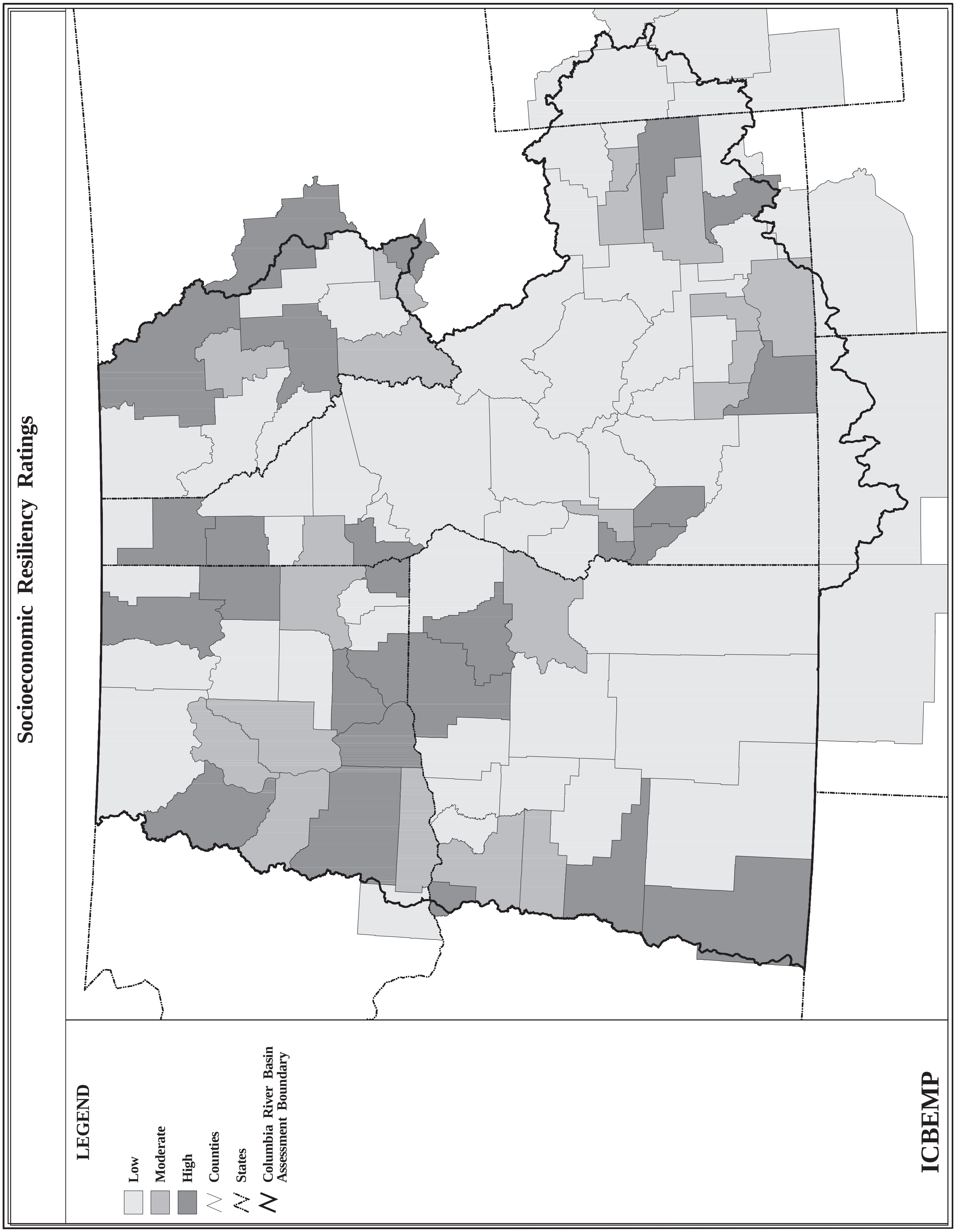
Estimating resiliency at the county level based on employment diversity provides a different picture, requiring some care to interpret. The average resiliency index for the 100 counties in the Basin is 0.70, much lower than the average calculated for the much larger BEA areas. This difference suggests that employment options, and thus employment diversity, is less at the county level than at the subregional (BEA) level.

Social Resiliency—This was measured at the community scale using four factors: (1) civic infrastructure (that is, leadership, preparedness for change); (2) economic diversity; (3) social/cultural diversity (population size, mix of skills); and (4) amenity infrastructure (that is, attractiveness of the community and surrounding area).

In general, communities that are smaller and have lower resiliency in the Basin follow the arid crescent that reaches south from the Columbia Plateau in eastern Washington, around the western and southern boundaries of the Blue Mountains in Oregon, and continues east along the Snake River plains in Idaho. This zone receives less than 12 inches of precipitation each year.

Communities that exhibit higher resiliency are located along the Cascade Range, the central mountains of Idaho, and in the vicinity of Missoula, Montana. These communities have more diverse economies than those that are located in the arid crescent. They also have the region's fastest rates of human population increase and contain recreation settings that receive the greatest amount of recreational use. These areas contain the highest

A community that may be currently rated as less resilient than others may still be able to demonstrate resiliency fairly quickly, even in the absence of strong economic structure or diversity, larger population size, or other typical indicators of resiliency.



Map 21—Socioeconomic resiliency ratings by county.

concentrations of Forest Service-administered lands, have more rainfall, and are generally montane environments.

When interpreting social resiliency, it should be kept in mind that humans are highly adaptable. Many communities have successfully addressed change through mobilization of community residents and energy. In other words, a community that may be currently rated as less resilient than others may still be able to demonstrate resiliency fairly quickly, even in the absence of strong economic structure or diversity, larger population size, or other typical indicators of resiliency.

Socioeconomic Resiliency—This composite rating, developed at the county level, combines three factors discussed as part of social and economic resiliency: population density (expressed as people/sq. mile); economic resiliency (defined by economic diversity); and lifestyle diversity. The combined score for a given county was developed by weighting each of these three factors equally.

A low rating applies to 54 Basin counties with low population density (less than 11 people/sq. mile), low or medium economic resiliency and low or medium lifestyle diversity (map 21). These counties account for 68 percent of the area but only 18 percent of the population. Some counties lack sufficient population to sustain existing services or to develop necessary social services. A related concern is whether these counties are able to maintain the existing infrastructure both in the physical and social senses especially in terms of community. One example is counties that are too sparse to sustain a medical clinic.

Another 20 Basin counties were rated as having an intermediate level of resiliency; these were associated with mostly medium economic resiliency ratings and generally either medium or high lifestyle diversity or population density ratings.

A high socioeconomic resiliency rating applies to the 26 Basin counties that are more densely populated (greater than 11 people/sq. mile) and these counties have the highest level of economic resiliency. Counties with high socioeconomic resiliency typically have high population densities, medium economic resiliency, and medium to high lifestyle diversity values.

The results for socioeconomic resiliency are somewhat deceptive. While 68 percent of the area within the Basin is rated as having low socioeconomic resiliency, 67 percent of the people of the Basin live in areas with high socioeconomic resiliency. One should not assume that those who live in areas of low resiliency experience low economic or social well-being, just as one should not assume that those living in areas of high resiliency experience high economic or social well-being.

Finally, it is incorrect to associate high or low resiliency at the county level with individual communities within counties, and would also be inappropriate to equate high or low resiliency with quality of life or the desirability of a county as a place to live. These relative ratings are intended only to show relative levels of vulnerability to change.