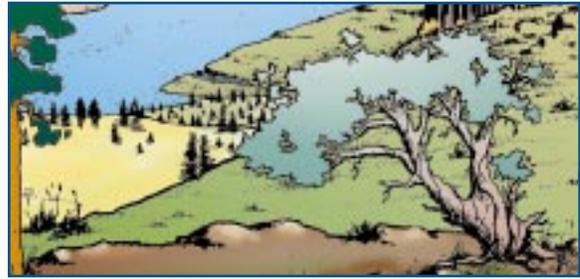


## SOCIAL AND ECONOMIC SETTING



**H**uman use of natural resources in the Basin is one of the major determinants of existing ecosystem conditions. The role of humans in the ecosystem has changed dramatically over time, with equally dramatic effects on the land, water, air, and other species. Human values regarding ecosystems have changed as well, as have the economic needs of an increasingly complex society.

Understanding how people relate to and interact with the environments in which they live (or in which they have interest) is an essential component of comprehending the functioning and therefore the management of ecosystems. People are part of the ecosystem, both in the sense of being another species that depends on other ecosystem components and because humans determine how ecosystems are socially defined, studied, and managed. The public and federal agencies agree that ecosystem management calls for consideration of what is sometimes called the “human dimension” of ecosystems, which includes people’s traditional and changing perceptions, beliefs, and possible future influences on ecosystems.

*Tribal groups within the culture area known as the Columbia Plateau possessed knowledge of the land gained over centuries of occupation.*

### Human Settlement

The Basin has been occupied by people for at least 12,000 years, when it is believed migration occurred across the Bering Straits land bridge from northern Asia. After continued warming conditions caused greater glacial retreat, early hunting societies diversified and began to fish and gather foodstuffs, which created localized cultural groups that followed seasonal patterns of flora and fauna to support their needs. Although the life-ways of native cultures evolved with important regional differences, the cultures of the Basin have a number of common elements and are, for this discussion, considered together.

Tribal groups within the culture area known as the Columbia Plateau possessed knowledge of the land gained over centuries of occupation. Within a yearly rhythm of seasonal rounds, specific places for fishing, hunting, and gathering became important to these groups. Favored areas for berry picking, root gathering, hunting, and the collection of other necessary materials offered a familiarity and continuity with the land and affirmed people’s spiritual beliefs that their lives were orderly because of their “right” behaviors in association with it. American Indians were linked to their environment by careful observation, economic calculation, ritual monitoring, and religious explanation.

Access to major rivers was critical. The rivers provided salmon, steelhead, sturgeon,



Woman picking berries in a traditional use area.

lampreys, suckers, and trout. Fishing methods were successfully adapted to habitats adjacent to major waterfalls on the Columbia River, such as Kettle Falls, Priest Rapids, Celilo Falls, Five Mile Rapids, and the Cascades, as well as Salmon Falls and rapids on the upper Snake River.

Contrary to the beliefs of non-Indian emigrants arriving in the region in the nineteenth century, the Basin and adjoining areas were not pristine wildernesses, but ecological systems in which humans had been an active component. American Indians liberally employed fire as a tool to manage

vegetation, fires that differed from those ignited by lightning in terms of seasonality, frequency, and intensity. The low-intensity, high-frequency fires set by American Indians served many purposes. They enriched forage for grazing, encouraged vegetation which provided browse for large mammals and berries for human and animal consumption, signaled other tribes or sent warnings, and were used in ceremonial events.

Lewis and Clark's expedition from 1804 to 1806 offered Euro-Americans the first glimpse of the potential of the American West, a seemingly endless expanse of land, game, and rivers that attracted adventurers, fur trappers, and homesteaders. The fur trade soon lured many newcomers; by 1820, 450 vessels had sailed into coastal

*The Basin and adjoining areas were not pristine wildernesses, but ecological systems in which humans had been an active component.*

waters to engage in it. The dominant fur trader, the Hudson's Bay Company, developed a policy aimed at trapping the fur-bearing animals of the Snake River plains to extinction in order to discourage potential competitors.

Missionaries began traveling west in search of converts, both bringing religion and promoting family-based agriculture. The 1840s brought profound change to the American West as restlessness seized a generation of Americans. Based on the success of early missions, families began making the nearly 2,000-mile trek on the Oregon Trail from Independence, Missouri, to the Willamette Valley in Oregon. During the period from 1840 to 1860, most of these overland migrants passed through the Basin en route to the Willamette Valley's greener pastures and proximity to navigable waters.

A series of Federal Homestead Acts reflected the era's Federal policy—to transfer public lands as easily as possible to citizens who could make use of them. Federally-supported railroad developments changed the shape of the West. The “checkerboard” ownership patterns of the lands in central Washington and elsewhere are a legacy of these land grants and the railroads. By the 1880s it was possible to arrive in the Pacific Northwest in five days instead of five months.

The discovery of gold in 1862 drew many to the Basin. Thousands of miners flowed to the region, leading to development of towns and the infrastructure that in turn drew stock raisers and farmers. Mining towns took on an urban cast, with hotels, restaurants, general stores, blacksmith shops, sawmills, laundries, and other service businesses that supported mine workers.

Irrigation had been underway in parts of the Columbia River basin as early as the 1880s. Most of the nineteenth century projects were small,

*After nearly a century of policies which disposed of public lands, the Federal government began to view the remaining public domain as a storehouse which could sustain productive values.*

often consisting of hand-dug ditches that irrigated bottom land of 30 acres or less. Passage of the Newlands Reclamation Act in 1902 established the Reclamation Service in the Department of Interior. The Act deposited profits from the sale of western lands into a reclamation fund to support irrigation projects, allowing the Federal Government to underwrite the building of dams, canals, and ditches beyond the capabilities of communities or the private sector. This made it possible for more people to settle in the interior Basin. Cooperative ventures and Federal projects mounted by the Bureau of Reclamation grew rapidly in the twentieth century. Today, irrigation from both surface and ground water sources is by far the dominant off-stream use of water in the Basin.

The U.S. Forest Service was established in 1905 to manage a growing inventory of Federal forest reservations established to conserve resources—especially water. In Gifford Pinchot's view, the reserves could protect water supplies for irrigation and western cities, provide cheap grazing, and repay the Treasury with timber sales while contributing to national growth and the stability of local economies. After nearly a century of policies

which disposed of public lands, the Federal Government began to view the remaining public domain as a storehouse which could sustain productive values.

Following on the heels of mining and agriculture, a third leg of the Basin's economy, the timber



Early immigration to the Basin was encouraged through Federal policies.



Railroads made it far easier not only for people to reach the Basin, but for timber and other resources to be delivered from the Basin to broader markets.

industry, took off near the close of the nineteenth century. The industry paralleled development of mines and railroads—railroads needed wood for ties and trestles and created links to markets, mines needed timbers for shoring, and lumber mills needed access to the woods to extract logs.

In the early 1900s, road construction began to open the forests of eastern Washington and Oregon. Constructed mainly through river valleys, riparian areas, floodplains, and adjacent hillsides, the roads efficiently provided access but decreased

the land's effectiveness as wildlife habitat and provided a new avenue for erosion and discharge of sediment into streams. In 1916, the region's first paved, rural roadway, the Columbia River Highway, opened to link the western and eastern slopes of the Cascades.

Automobile access gave people the means to travel throughout the interior Basin for recreation. In 1916, the National Park Service was created to handle the administration of the growing set of national parks and monuments. Although the



The automobile opened up a new era of tourism and recreation, in this case through an old forest of single story pine.

early parks had been promoted for local economic development, increased visitation and public sentiment to protect natural features led to the Park Service's Organic Act of 1916, mandating a mission of limited development, "...which purpose is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

Grazing was another land use that took hold in the Basin, increasing the feasibility of homesteading and creating a lifestyle that remains today. In the 1920s, ranchers and others recognized that overgrazing of public lands, in combination with drought conditions, was severely impairing the ability of the land to support their operations. Impetus for initial regulations also came from Frederic V. Coville's influential *Forest Growth and Sheep Grazing in the Cascade Mountains of Oregon*, published in 1898. His recommendations led to

an allocation and permit system under which stock raisers secured grazing privileges within bounds of regulations set by the U.S. Forest Service.

The Taylor Grazing Act of 1934 brought range regulation to 142 million acres in 11 western states, removing the area from potential sale and placing it under the jurisdiction of the Grazing Service, which evolved into the Bureau of Land Management in 1946. Range improvement projects were undertaken and local advisory boards established to allocate and manage the rangelands. The condition of rangelands in the interior Basin has generally improved since then, although with slower progress in riparian areas.

The systematic exclusion of fire from ecosystems began in the early 1900s; fire was viewed as a threat to forests as well as to the lives and property of increasing numbers of settlers. The newly-created Forest Service believed that fires killed regeneration under larger trees, unaware of the increased problems with wildfire control and forest health. Thus while fire was being used west of the Cascades to reduce slash after logging, its general occurrence was being excluded from the east side of the Cascades where it had occurred frequently.

*The systematic exclusion of fire from ecosystems began in the early 1900s; fire was viewed as a threat to forests as well as to the lives and property of increasing numbers of settlers.*



Near Burns, Oregon. Turn-of-the-century cowboys around the chuck wagon.

While this fire-exclusion policy was well-intended, the result over time was a change in forest stands from seral, fire-adapted species to more fire-susceptible species that formed unhealthy stands that were subject to larger-scale fires and increased outbreaks of insects and disease. This societal attitude, successfully perpetuated by Smokey the Bear since 1945, prevailed until the 1980s, as the role of fire as a natural disturbance came to be more widely understood.

This brief look at the history of interactions between people and other ecosystem components of the Basin explains some of the reasons why past actions were taken. This is a prerequisite not just to learning about how present ecosystem conditions arose, but to understanding the rationale behind human uses of natural resources and the basis for peoples' judgments about the acceptability of those uses and their effects.

## Basin Population Today

In 1990, just under three million people lived in the Basin. The Basin is sparsely populated; the 100 main counties in the Basin account for about 8 percent of the land area in the United States, but only 1.2 percent of the population. Nearly half the population is located in 12 of the 100 counties, although just six of these (Ada and Canyon Counties in Idaho; and Benton, Yakima, Franklin, and Spokane Counties in Washington) are large enough to be called metropolitan counties.

The age distribution of Basin residents is very similar to that of the Nation, but contains a larger proportion of people under 18 and a smaller proportion who are in the prime wage-earning years of 25 to 49. The project area contains a larger proportion of Whites (92 percent) and American Indians (2.4 percent) than does the United States (80 percent and 0.8 percent, respectively), and a smaller proportion of Blacks (0.6 percent, compared to 12 percent nationally), and Hispanics (6.7 percent, compared to 9 percent nationally).

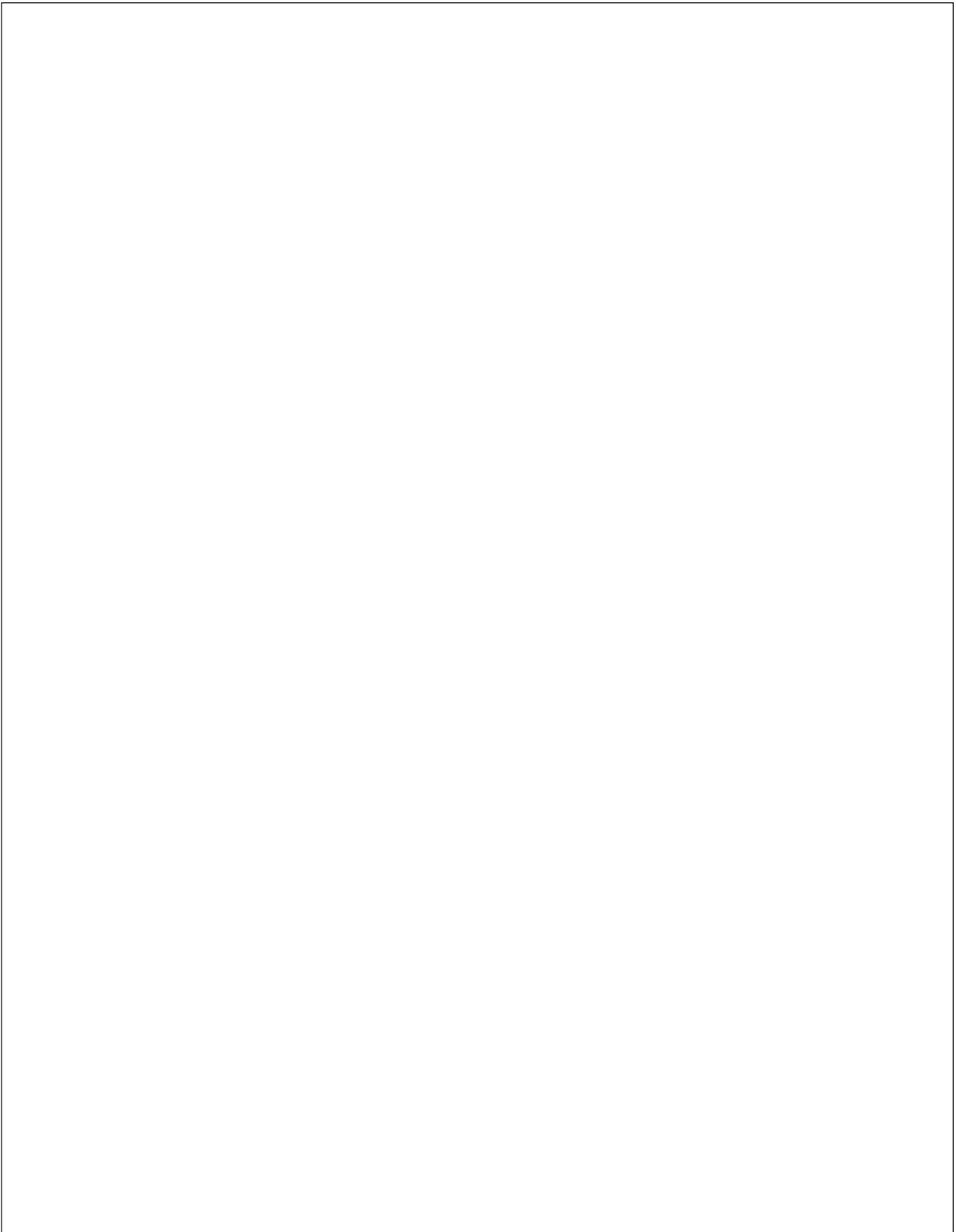
Population growth in the project area over the last 45 years has reflected the dramatic changes occurring nationwide. Between 1950 and 1970 there was a significant out-migration from rural to urban settings; in the Basin, over one-third of the counties showed population losses. During the 1970s, Basin counties reported population increases, while the 1980s demonstrated a return to traditional urban migration and population patterns.

In the early 1990s, population growth again occurred throughout the Basin; 96 percent of counties increased in population. In addition to metropolitan counties, one type of county that showed large increases were so-called recreation counties, those in which recreation and tourism play a large role in the economy, accounting for

24 percent of the population increase in the project area (map 5).

Assumptions about migration rates affect estimates of future population growth patterns. A low estimate, already exceeded in many areas, results in a population by year 2040 of about 3.5 million compared with the high estimate of nearly 6.5 million. Given recent swings in population settlement patterns, it is difficult to tell with certainty which scenario is most likely. However, even though overall population density would still remain well below the national average, there is a reasonable potential for greatly increased growth.

*In the early 1990s, population growth again occurred throughout the Basin; 96 percent of counties increased in population.*



Map 5—Counties experiencing high growth rates.

## Attitudes, Beliefs, and Values

Data from existing surveys and those conducted for the ICBEMP were used to examine people's attitudes, beliefs, and values on questions relevant to the project. This information is valuable because it suggests what aspects of ecosystem management may be the most acceptable, contentious, or confusing. They also provide the public and agency decision makers with greater understanding about why people feel the way they do.

Recent national surveys have found that a majority of the American public continues to support the environment and believes environmental issues remain a high social priority. However, support may be slightly lower than it was several years ago. People tend to believe a balanced approach to public land management is possible, but favor environmental protection over economic growth if forced to choose between the two (although many believe that the future does not necessarily involve this choice).

### Attitudes, Beliefs and Values

Attitudes reflect peoples' evaluations of something as favorable or unfavorable. They can be strong and well-formed or weak and broad, and are generally developed through a variety of learning processes. Beliefs reflect what people think is true about something—a person's subjective probability that an object has one or more attributes. Values reflect the things people hold dear to them. They are generally regarded as important life goals or standards of behavior for a person, and toward which the person has a strong, positive attitude; peoples' value systems could be viewed as the building blocks of many attitudes and beliefs. Values, like attitudes and beliefs, are dynamic but are more deep-rooted and resistant to change. Part of a land manager's job lies in understanding attitudes, beliefs, and values, how they change over time, and how they influence people's perceptions of land management actions.

Support for endangered species laws and regulations remains strong among a public majority, but the public is increasingly concerned with seeking a balance between species protection and costs to society—a concern especially strong among rural residents. Support for salmon recovery and a willingness to accept resulting socioeconomic effects seems to be stronger than that for endangered species in general, although most people perceive that the major barriers to recovery are dams and over-fishing rather than lack of suitable habitat.

Disturbance events such as fire, insects, and disease have negative connotations to many people. Many people understand that these occur naturally in ecosystems, but also see the results as "a waste of good resources."

Many people say they have yet to hear a good definition of ecosystem management, and how it differs from the concept of multiple use. Many who support ecosystem management doubt agency ability or will to adequately implement it. Some clearly believe that ecosystem management is an excuse for the agencies to keep cutting timber under the guise of forest health. People who favor passive approaches to management believe

***Support for endangered species laws and regulations remains strong among a public majority, but the public is increasingly concerned with seeking a balance between species protection and costs to society—a concern especially strong among rural residents.***

that further human meddling with ecosystems can only lead to more unintended results. Others are simply opposed to the idea of ecosystem management for many reasons, including effects on private lands, the cost of restoration efforts, and perceived economic effects on individuals, communities, and broader economies.

Survey research typically finds differences in opinions between residents of small, rural towns and residents of larger urban areas as well as the national publics in general. National samples tend to be stronger on environmental protection and less sympathetic to local economic effects than are local residents—perhaps because non-locals may share more in the benefits than the costs. Residents of small towns in the Pacific Northwest are less likely than urban residents to favor strengthening the Federal role in resource protection. However, there are many issues for which the opinions of these populations are similar, such as favoring an increased role for the public in public land management. Survey research suggests that the public prefers to work with the Federal agencies and others having management authority, rather than relying on legislation or court cases to achieve mutually desirable conditions. People often favor increasing the role of local or state government.

The institution of land and property rights, which plays a central role in ecosystem management, is a highly controversial social issue that is increasingly being defined in the courts. One aspect of this debate is the idea of “takings,” based on the Fifth Amendment statement that private property shall not be taken for public use without

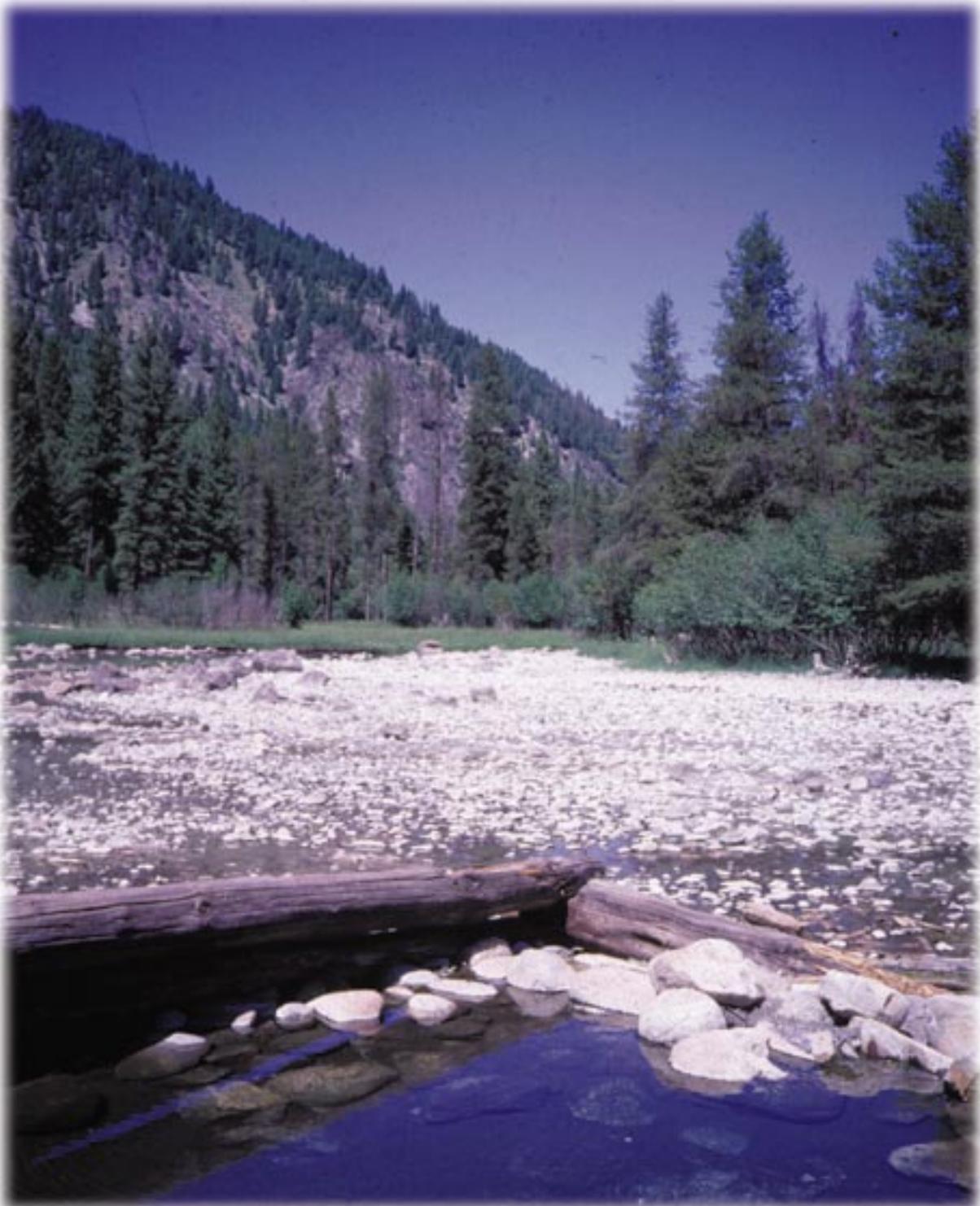
*Survey research suggests that the public prefers to work with the Federal agencies and others having management authority, rather than relying on legislation or court cases, to achieve mutually desirable conditions.*

just compensation. Advocates for private property insist that government regulations, especially those initiated for environmental protection, constitute taking because they reduce the opportunity for property to be freely used at the discretion of the individual. Another central issue is consolidation of private ownerships and the increased public reliance on Federal lands for access to valued opportunities.

One important value that has implications for ecosystem management is sense of place, which refers to how people define ecosystems and specific locations in the landscape based on their meanings and images. Recreation visitors develop attachments to places based on their past experiences—meanings that often pass from one generation to another. People who make their living from public land resources and opportunities typically develop close relationships to places on the land. Community residents and other social groups tend to develop collective definitions of places that are socially important, providing a stronger sense of community.

The concept of place has not been widely or uniformly used by Federal land management agencies, yet the task of defining places has proven to be a positive process, both involving community residents and spurring discussion about common visions for public land management.

*One important value that has implications for ecosystem management is sense of place, which refers to how people define ecosystems and specific locations in the landscape based on their meanings and images.*



Based on their experiences, people attach meaning to places in the landscape. Attachments can develop that last through generations at places such as this hot springs near Sheep Creek in central Idaho.

## Existing Benefits of FS- and BLM-administered Lands

A fundamental tenet of land stewardship is for managers to direct and maintain ecosystems to fulfill the objectives of the owners. For the FS and BLM, providing a broad array of ecosystem goods, functions, and conditions is appropriate because it is required by laws and regulations and because demands from their constituencies are extensive and diverse. The economic challenge of ecosystem management for these agencies is three-fold: to produce the bundle of ecosystem goods, functions, and conditions that society wants (economic efficiency); with a distribution of benefits according to societal wishes (equity); and without adversely affecting economic activity.

### Economic Efficiency

Under current management, FS- and BLM-administered lands in the Basin provide society with a wide array of benefits. The current and future importance of selected benefits that could be measured and valued is shown in **table 1**. Of the outputs and conditions evaluated, the exist-

ence of unroaded areas is a highly valued condition on FS- and BLM-administered lands in the Basin today. Projections indicate that it will continue to be so in the year 2045, although to a lesser degree. The Basin contains 70 percent of the unroaded areas of 200,000 acres or greater in the United States (outside Alaska).

Projections indicate that by the year 2045 the three most highly valued uses will be motor viewing, day use, and trail use. This suggests that the objectives of land management activities might be different in the year 2045 than they are today. For the Basin as a whole, the relative importance of wildlife viewing, motor and non-motor boating, range, off-road vehicle (ORV) use, and snowmobiling provided by FS- and BLM-administered lands are included in the category labeled “other” (table 1).

Broad indicators suggest that forest acreage and inventory at the Basin-wide level are being sustained. Given current levels of recreational activity and harvest, publicly grown Christmas trees, firewood, mushrooms, and berries, as well as some other Federal resources face potential overuse. Because these valuable resources are available to the public at little or no cost, there is little incen-

Table 1—Current and future benefits.

Activity	1995 Value	2045 value
	..... percent .....	
Camping	3.45	4.40
Day Use	5.28	8.11
Fishing	9.88	6.64
Hunting	9.48	6.31
Motor Viewing	1.88	9.46
Timber	11.49	5.38
Trail Use	3.28	6.85
Existence value of unroaded areas	46.86	41.43
Winter Sports	5.05	5.70
Other	3.35	5.72
<b>Total</b>	<b>100.00</b>	<b>100.00</b>

tive for users to conserve them. The increases in human population predicted for the Northwest suggest that demands on ecosystems and public resources will continue to increase. Establishing a fee system for recreation and special products could protect ecosystem conditions in recreational settings, maintain sustainable or harvestable levels of species, and provide new sources of revenue.

## **Equity**

The benefits of FS- and BLM-administered lands in the Basin are distributed widely. Consumers of beef or timber benefit because these goods are traded in national markets. People who enjoy knowing unroaded areas exist and who may never visit the Basin also receive benefits. Millions of people, mostly residents of the Basin and the Northwest, recreate here; there is little difference in participation rates among people with different lifestyles.

About 220,000 jobs are associated with current levels of range, recreation, and timber harvest on FS- and BLM-administered lands. Range accounts for 1 percent of these jobs, recreation 87 percent, and timber 12 percent. In addition, jobs are associated with mining and the harvesting of special forest and range products, but the exact number is unknown.

Federal distributions to county governments from revenue sharing are currently determined from timber sales and grazing permits. Yet some of these counties bear costs associated with recre-

*The increases in human population predicted for the Northwest suggest that demands on ecosystems and public resources will continue to increase.*

ation—infrastructure, road maintenance, and emergency services, for example. If the value of recreation on Federal lands was included in payments to counties, it could double or triple their revenues.

## **Economic Activity**

**The Basin**—Agriculture and agricultural services remain economic strengths of the Basin. The Basin has a large, diverse economy of 1.5 million jobs that is enjoying above average rates of growth. Per capita income is growing faster than the U.S. rate, and the poverty rate is generally lower than the national average. The past decades have seen rapid population growth, and the evolution of what was a mature, resource-based economy into a diverse economy oriented toward the technology, transportation, and service sectors (table 2).

The relative importance of various sectors to the size of the Basin economy and its buying power include grazing (1 percent), mining (0.5 percent), recreation (15 percent) and timber (3 percent). The recreation counties have higher per capita income than manufacturing counties, indicating they are areas of higher economic well-being and fiscal capacity.

General economic growth in the Basin is expected to continue, sustained by in-migration in some areas. Growth is expected in services, finance, insurance, real estate, trade, and agricultural services. Fastest growth is expected in the service sector, which includes health, business, educational, and legal services. The manufacturing, farming, and government sectors are expected to decline as a percent of the economy over the next 50 years.

*The past decades have seen rapid population growth, and the evolution of what was a mature, resource-based economy into a diverse economy oriented toward the technology, transportation, and service sectors.*

Table 2—The relative employment contributions by selected economic sectors comparing the Nation with the Basin (percent of 1.5 million jobs in 1995):

Sector	Nation	Basin Average
	..... percent .....	
Agriculture services	1.14	2.56
Mining	0.66	0.45
Construction	5.20	4.65
Manufacturing	14.11	11.71
Transportation	4.76	4.30
Trade	21.49	21.14
FIRE (financial, insurance, and real estate industries)	7.53	6.00
Services	28.38	25.02
Government (all)	14.57	16.39
State and Local	10.44	12.18
Federal	4.13	4.21
Farm Employment	2.16	7.78
Lumber and Wood products (subset of Manufacturing)		2.52
Range (subset of Farm employment)		1.01
Recreation (subset of Trade and Services)		15.00

Traditional regional economics views growth as a function of expansion in basic manufacturing industries. Contemporary challengers argue that other industries should be considered to be part of the economic base. The ICBEMP assessment findings indicate that changes in management strategies by the FS and BLM have little effect on the economy of the Basin or its subregions using either of these two approaches. However, the effects of the agencies may be more pronounced at specific local levels.

The nine regional economies in the Basin as described by the Bureau of Economic Analysis (BEA) are diverse, and thus resilient to changes in FS and BLM commodity outputs. Overall, the forest products industry has had a neutral effect on recent economic growth. Analyses found no relation between economic well-being at the county level (expressed as per capita income)

and either the forest products processing facilities or the presence of timberlands—whether Federal, FS only, or private. Basin-wide, the cattle industry accounts for 29 percent of agricultural sales, but only 7 percent of the cattle industry is dependent on BLM and FS forage. Recreation accounts for 14.6 percent of the jobs in the Basin. Mining accounts for 0.5 percent, with an uncertain proportion attributable to FS and BLM resources.

**Counties**—The county is also a critical unit for economic analysis. Counties grouped according to a typology of income specialization or other characteristics exhibit different patterns of economic behavior. Those dominated by the service sector have consistently shown the highest rates of economic and population growth since 1970; they have also exhibited high resiliency, rebounding faster than other counties after the early 1980s recession. These include counties with trade-center



Rural community. This is a landscape dominated by a rural community in a plains (or valley) environment, surrounded by agriculture, range, and forest. Humans have typically settled in the most productive areas that have available water and are close to the foothills and mountains. This often results in conflicts between humans and the wildlands that surround their communities.

towns, and growing recreation and tourism economies. Counties dominated by recreation or retirees have shown consistently high rates of growth in population, total employment, and total personal income over the last 20 years. Between 1979 and 1989, counties in which manufacturing income is dominant showed the highest tendency to evolve to a different kind of economy. Many of these did so because of losses in the wood products or mining sectors.

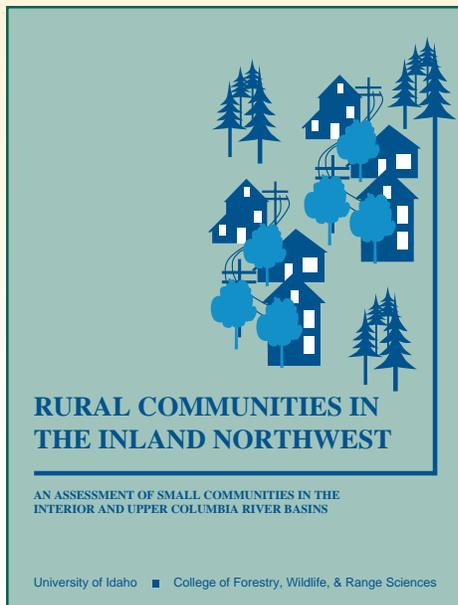
**Communities**—The Bureau of Census recognizes 476 communities within the project area, including 29 cities larger than 10,000 in population and 49 Census Designated Places—locations that are unincorporated but have an identity to the local population. Of the other 398 small rural

communities, 68 percent are communities of 1,500 or less (the smallest size class). These range from 22 to 1,500 in size, with an average population of 520.

The status of communities within the Basin is defined in terms of their capacity to adapt to change. This ability, termed “community resiliency,” is a function of economic structure, physical infrastructure, civic leadership, community cohesiveness, and amenities. Information collected about community conditions included employment profiles of nearly 400 communities in the Basin with less than 10,000 people to develop local indices of economic diversity. **Figure 3** describes employment by sector for the Basin’s rural communities of 10,000 or less.

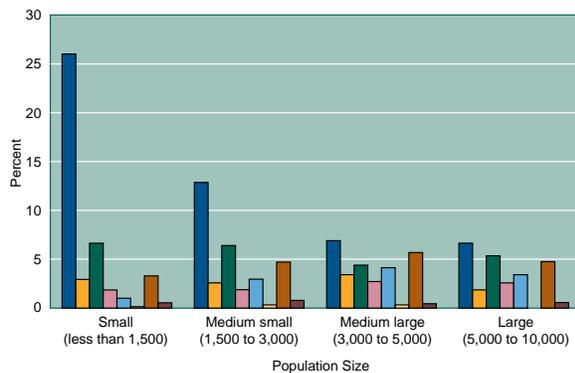
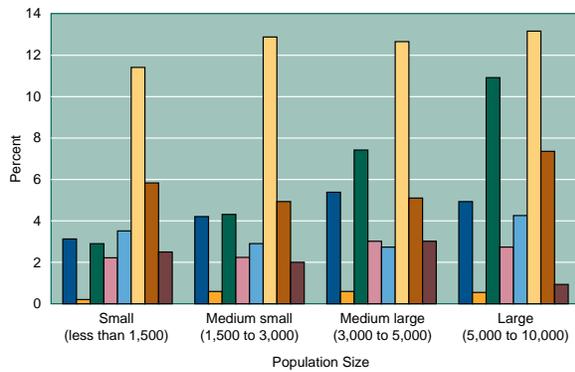
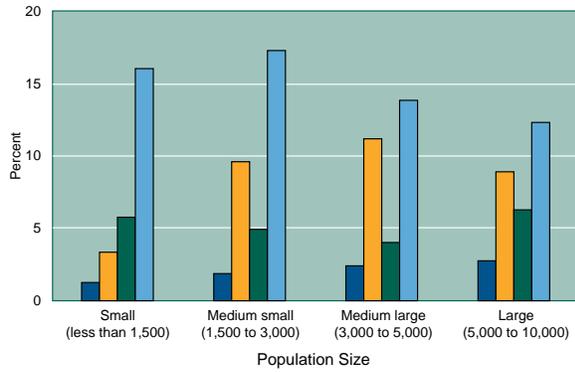
# Communities

Community is an important scale for ecosystem assessments because communities are where people socialize, work, shop, and raise their children—the focus of their social lives. In public meetings conducted by the Science Team and in scoping and other meetings held by the EIS teams, people repeatedly expressed concern that conditions and functions of communities and related places used and valued by residents be identified and considered alongside other ecosystem components. For the ICBEMP, many types of information about Basin communities were collected, particularly for those with populations less than 10,000. An important source of primary data was a series of Community Self-Assessment workshops—interviews with 1,350 community leaders and residents held in nearly half (198) of the Basin’s small communities. In addition, a profile of the economic structure of each community was developed, because social and economic conditions in communities are intertwined.



Self-assessment workshops were held in nearly half of the Basin’s small, rural communities.

Figure 3—Employment profiles by size of community.





Shaniko, Oregon, not all that different from how it looks today. Some towns are resilient by virtue of their small size and social cohesiveness.

Agriculture dominates the smallest towns, but more surprising is the relative diversity present across communities of all sizes. Wood/paper products manufacturing, retail trade, state and local government, and eating/drinking sectors all contribute substantially regardless of community size. The role of some sectors, such as business and personal services, increases with community size. The community workshops showed that people tend to underestimate the diversity of their local economy and overestimate the importance of traditional industries.

However, the economy is just one component of overall resiliency. In general, more-resilient communities tended to be larger, more autonomous, be rated by residents as having a local government responsive to the public, and have plans

for dealing with change—as well as having an economy based on a mix of industries. The data suggest that there is no one common formula for achieving community resiliency; many strategies have proven successful. Natural resource dependent communities that have been confronted with significant challenges are among the most resilient because they have successfully learned how to deal with change.

Analysis of data gained through the community self-assessment workshops suggest that it is useful to think of three types or groups of communities with respect to resiliency. The first group has the highest scores on all five of the community characteristics that contribute to resiliency; these are communities viewed by their leaders as attractive, economically diverse, socially cohesive, and having

strong civic leadership. These communities also tend to be larger in population and exhibit the greatest economic diversity. This group tends to contain a larger number of communities than the other two groups. These communities presumably have a number of different characteristics that will allow them to meet new challenges successfully.

The second group of communities has comparably high scores on civic leadership and amenity values, but much lower scores on social cohesion and economic diversity. Towns in this group have considerably less population than those in the first group. The number of towns in this group is slightly lower than the number in the first group. This type of community may lack the economic base to deal with change successfully, but this could be compensated for by forward-thinking civic leaders and the presence of amenities.

The third type of community tends to have the lowest scores on all of the measures (although scores on amenities were only slightly lower). They are intermediate in population (though closer in size to the smallest rather than the largest towns). These communities may find it difficult to cope with change because they have few current strengths on which to build. From a Basin-wide perspective, this group is by far the smallest, containing just a handful of communities.

The community is an important level of social analysis, but within communities there are many different sociocultural groupings that could be affected differently by ecosystem management programs and activities, such as occupational groups that have identities strongly tied to natural resources. These are sometimes referred to as “communities of interest.” Changes in public land conditions and outputs can have many significant effects on the quality of people’s lives, even if they live in a resilient community.

## Characterizations of Specific Resources

This section focuses on some of the economic sectors most closely related to management of FS and BLM lands, and begins with historical descriptions of those economic sectors initially most important to settlement of the Basin.

### **Fish**

When Euro-American settlers arrived during the early 1800s, salmon were abundant and diverse. Spawning runs of chinook salmon made their way up the mainstem Columbia to the Snake River, and then up to the headwaters of the Owyhee and Bruneau Rivers and Salmon Falls Creek as far as Nevada.

Estimates of historical run size for all species of salmon and steelhead in the Columbia River range from 10 to 16 million adult fish. Not only was their course unimpeded by dams, but ample suitable habitat to support these populations existed. Fur trappers and traders reported extensive stands of willows and alders, and wide, wet meadows along stream systems throughout the interior of the Columbia River basin. The Ochoco Mountains take their name from an American Indian word meaning “streams lined with willows.”

Commercial harvest began in earnest when the first cannery began operating on the Columbia River in 1866 and soon exceeded sustainable levels. Commercial catches of chinook salmon in the Columbia peaked in 1883 when about 43 million pounds of fish were landed. Coho, sockeye, chum, and steelhead also were abundant in the Basin. Catch of coho peaked at 6.8 million pounds, and catch of sockeye and steelhead peaked at 4.5 million pounds in 1895. By the late 1800s, overfishing was blamed for broad declines in chinook salmon runs. By 1900, certain fishing gear was banned to protect spawning runs, but the effects from mining, timber harvest, livestock grazing, and agriculture had begun.



Dams such as this one provide irrigation, while others generate hydropower. However, they are now part of a societal debate due to their impact on fish habitat and populations.

New Deal programs were critical in sustaining and building infrastructure in the interior Columbia River basin. The river's mainstem dam construction began with the Bonneville Dam in 1938 and the Grand Coulee Dam in 1942. Later, however, the debate over dams came to symbolize new types of emerging social values. After World War II, as more citizens were affected by environmental changes, grassroots action and citizen demands began to bring environmental values to the forefront. This set the course for conflict between forces associated with large-scale management and technology and those emphasizing protection of environmental quality. This change was symbolized by debate over dams in Hell's Canyon, which shifted from who should build them, and how

many, to the possibility, voiced by Supreme Court Justice William O. Douglas, that maybe the river had greater value in its free-flowing state.

The net result of these and a multitude of other actions has been the virtual elimination of a valuable commercial fishery. It has also meant incalculable damages to American Indians for whom salmon was a significant part of their economic, cultural, and spiritual lives. The FS and BLM are managing much of the last remnants of good quality habitat for declining fish stocks. The burden on the FS and BLM to maintain habitats that support strong fish populations will probably increase with human population growth and climatic influences on ocean habitat.

Map 6—Status of mines and deposits.

## Minerals

Coal deposits had been reported as early as 1833 by an employee of the Hudson's Bay Company, and significant base metal and silver lodes were discovered in eastern Washington during the late 1800s and early 1900s. But it was the discovery of gold that drew many to the Basin. In 1862, several placer deposits were announced, including deposits on the John Day River near Canyon City, Oregon; at Florence, Idaho, on the Snake River; and at Pierce City and Orofino, Idaho, on the Clearwater River. Strikes in the Boise basin and other locations would soon follow. Thousands of miners flowed to the region, leading to development of towns and the infrastructure that in turn drew stock raisers and farmers. The General Mining Law of 1872, following the precedent of the Mining Law of 1866, opened minerals on public lands to all. Mining practices of the nineteenth century also established the logic behind western water law—first in time, first in right.

### *Mining practices of the nineteenth century also established the logic behind western water law—first in time, first in right.*

Currently, the Basin produces 30 percent of the nation's silver, 12 percent of the nation's phosphate, and 11 percent of the nation's gold. There is a smaller percentage of mining employment in the Basin than nationally (0.45 percent versus 0.66 percent), but mining is very important in six of its counties.

Future mineral production will depend on metal prices, laws, and regulations rather than on changes in FS or BLM management practices. The extent to which mining activity will affect public lands is difficult to predict (**Map 6**). The greatest probability for mineral development in the long term is along three geologic trend-lines.

One is a northeasterly trend from southeastern Oregon into central Montana in which the most economically attractive targets include copper, cobalt, and large, low-grade deposits of gold and silver. In the western Northern Glaciated Mountain and North Cascades areas, mining for gold and silver will likely continue—first underground and then in open pit mines. Considerable base-metal resources lie in a northwesterly trend from southwestern Montana into northeastern Washington. Large-scale open-pit mining and processing of phosphate ore is likely to continue in the Snake Headwaters and Upper Snake regions over the long term.

## Grazing

Historically, a wide variety of ungulates, including deer, elk, mountain sheep, antelope, and bison occurred in eastern Washington and Oregon. Natural predators kept the numbers of ungulates in balance. These animals had wide ranging mobility, and their grazing and browsing were linked with the vegetation cycles within the Basin. Bunchgrass and other native vegetation in Basin plant communities are stimulated by disturbance from grazing, and plant abundance can be enhanced.

The widespread presence of bunchgrass initially attracted itinerant herders that could walk their stock to markets.

By the 1870s the goal of most ranchers was to secure a base of operations with dependable water supplies and the ability to cut and store sufficient hay to feed livestock during the winter—a base which has sustained many cattle operations to the present day.

As Euro-American settlement began, not only were many predators displaced, but sheep, and then cattle, were introduced in numbers large enough to result in overgrazing. By 1860, 200,000 cattle were settled in Oregon, along with sheep and wild horses; the grazing practice of the time was year-round open range. Anecdotal reports and photographs showed summer ranges



Wild horses on the range in eastern Oregon.



so laden with sheep that they appear to be snow drifts. Fescues and other bunchgrasses were irreversibly modified by extensive grazing in the late 1800s and early 1900s.

Overgrazing damaged stream and riparian vegetation in many basins in eastern Oregon and Washington. Overgrazing also facilitated the spread of annual cheatgrass and reduced vegetation that had provided fuels for fires. When combined with later fire-suppression efforts, the result was reduction of an important ecosystem disturbance. Another critical factor was climate, particularly drought, which affects how vegetation responds.

Cattle have dominated livestock production throughout the Basin at least since the first collection of agricultural data in the Census of 1870. The number of cattle grew steadily throughout the twentieth century to 4.1 million in 1969, a level that has remained relatively constant. Horses and sheep also played an important role in livestock operations in the Basin, although their importance dropped significantly after the 1930s.

Currently, the BLM accounts for 45 percent of the 2.9 million Federal animal-unit months (AUMs) of forage in the Basin, with the FS providing the other 45 percent. The dependency of the livestock industry on BLM and FS forage varies from 1 to 11 percent in the BEA regions, with a Basin-wide average of 7 percent. Sales of cattle dependent on BLM and FS forage average 2 percent of total agricultural sales across the Basin. Analysis at the county level shows relatively few counties (seven) that rely on FS or BLM lands for 1/3 or more of their grazing acreage, while 67 counties had less than 10 percent reliance on FS or BLM forage.

If current trends continue, forage use will decrease on BLM lands by 18 percent, and on FS lands by 19 percent, over the next two decades. On average, holders of BLM or FS grazing permits run bigger operations that are more profitable than those of non-permittees. The largest permit acreages and AUMs are skewed toward the largest permit holders—held by a small number of individuals, corporations, and partnerships.

## Recreation

Environmentally-based amenities managed by the Federal Government play many social and economic roles in the Basin; they contribute to the quality of life of Basin residents; attract new migrants; and provide recreational settings for residents and non-residents. FS- and BLM-administered lands in the Basin provide over 200 million recreation activity days per year, valued at \$1.0 billion per year (in terms of willingness-to-pay). At present, recreation on FS- and BLM-administered lands has a higher willingness-to-pay value than the market value of timber or range outputs across the Basin, except in the Klamath Basin area where projected timber values will be surpassed by projected recreation by the year 2005. Fishing provides the greatest benefits of all activities (\$300 million), followed by day use (\$250 million), downhill and cross-country skiing (\$230 million), hunting (\$146 million), and camping (\$75 million). By the year 2045, the most value to the increasing and older human population will be provided by (in decreasing order) motor viewing, day use, trail use, fishing, and hunting.

The FS and BLM manage over 90 percent of the federally owned recreation acres in the Basin. The Basin's abundant unroaded areas are an irreplaceable national resource; about 40 percent of the Federal lands in the Basin provide primitive or semi-primitive recreation opportunities.

Seventy-five percent of all activity days take place in roaded natural settings (road densities between 1.7 and 4.2 miles per square mile). Roads and access to riparian areas are an aspect of recreation common to what will likely be the most highly valued recreation activities for the next 50 years. If charged, recreation fees could be used to finance road maintenance, and to offset other potential decreases in road funds.

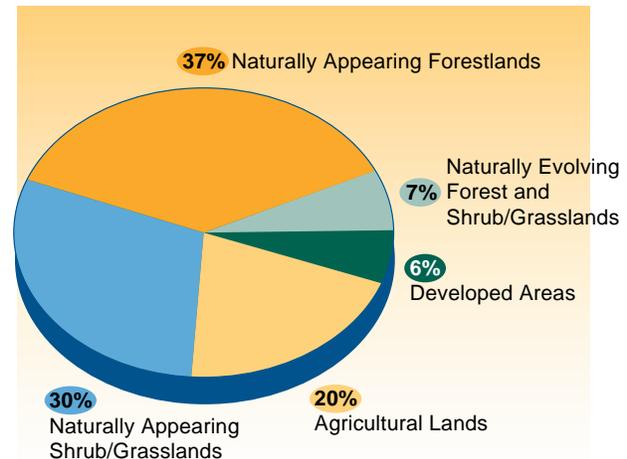
A tradeoff exists between access for some types of recreation and primitive/semi-primitive recreational settings for others. In the lower 48 states, 70 percent of the unroaded areas of 200,000 acres or

greater lie in the Basin; 56 percent of trail use in the Basin takes place in the primitive/semi-primitive settings. An appropriate balance between roaded natural and primitive/semi-primitive settings is a question that needs further study.

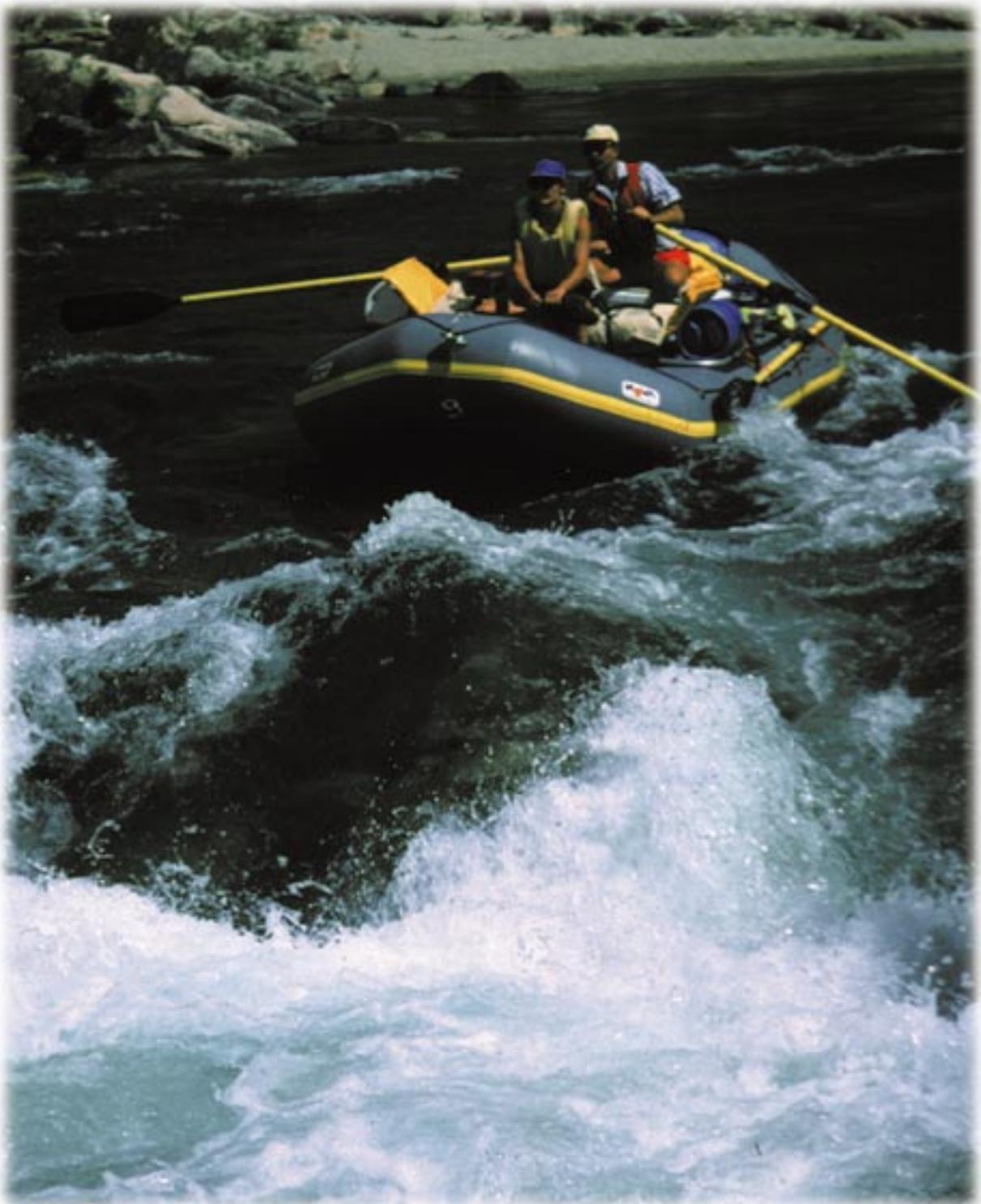
Purchases of food, equipment, lodging, transportation, licenses and other items associated with recreation on public lands add up to significant expenditures and support some 220,000 jobs in the Basin.

Landscape appearance and scenery are also important environmentally-based amenities, not just as settings for recreation, but as components of the Basin's image both to residents and non-residents. The supply of scenery in the Basin is measured in terms of landscape themes and degree of scenic integrity. The five themes used to describe project area landscapes are Naturally Evolving Forest and Shrub/Grasslands, Natural Appearing Forest Lands, Natural Appearing Shrub/Grasslands, Agricultural Lands, and Developed Areas. Just over 1/3 of the Basin currently is in Naturally Appearing Forestlands, and just under 1/3 is in Naturally appearing shrub/grasslands; of the remainder, the largest proportion is in agriculture (figure 4).

Figure 4—Landscape themes present across the Basin.



***The Basin's abundant unroaded areas are an irreplaceable national resource; about 40 percent of the Federal lands in the Basin provide primitive or semi-primitive recreation opportunities.***



Middle Fork of the Salmon, central Idaho. River running is one of many activities for which management has attempted to balance providing public opportunities with protecting the quality of the experience and the environment.



The Snake River in Hells Canyon National Recreation Area is a scenic landmark of regional and national significance.

Scenic integrity is reflected by the “visual intactness” or wholeness of the landscape. It was represented by combining data on vegetative structure, landform, and road density. Scenic integrity is not the same concept as scenic beauty, but research demonstrates that people often equate the two when perceiving conditions on public lands. Scenic integrity was described using five categories ranging from low to very high. Less than 1 percent of the acreage administered by the FS or BLM was rated as very low in scenic integrity, 7 percent rated as moderately low, 17 percent as moderate, 33 percent as high, and 42 percent as very high; less than 1 percent was not classified (**figure 5**).

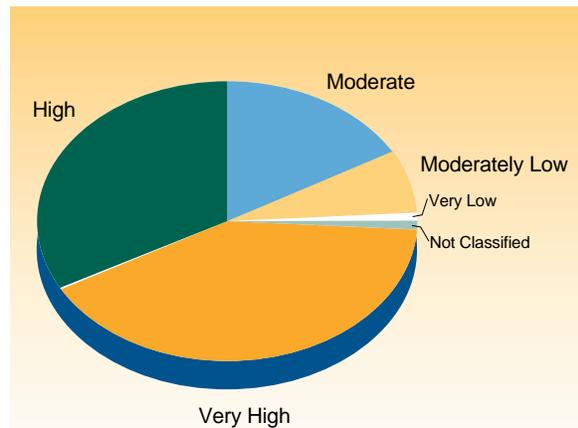


Figure 5—Scenic integrity present across the Basin.

## Special Forest and Range Products

Little is known about the special forest and range products industry in the Basin because data on jobs and harvest are not regularly gathered. Relative to west of the Cascade mountains, the industry in the Basin is small but growing and focused around wild edible mushrooms and huckleberries. Rapid expansion in the special forest and range products industry in the Basin is expected to continue. Under the present permitting system and without a fee system, some of these species may be over-harvested.

## Timber

By 1900, forests in the upper Midwest were nearly exhausted, and the northern interior Columbia basin became the focus of a new scramble for wood supplies. The rapid increase in harvest was reflected in Idaho, where 65 million board feet of lumber were cut in 1899. By 1910, Idaho produced 745 million board feet and its markets had shifted from local to national. Idaho employment of loggers, rafters, or sawmill workers

increased from just over 300 in 1880, to more than 8,000 in 1920, and to 14,900 in 1995.

Early harvesting concentrated on the largest trees of the more important commercial species (ponderosa pine and western larch) because smaller stems could not be processed efficiently. Eastern markets in particular demonstrated a preference for ponderosa and Idaho white pine, leading to select cutting where other species in mixed forests were left standing.

Growth of the timber industry continued in subsequent decades, driven by demand for wood products in growing urban centers, especially in the Midwest and California. Development of the skidder, caterpillar tractor, log truck, and chain saw increased the efficiency of the industry, lowered costs, and increased production dramatically. The timber industry, like other industries, took many people on a roller coaster of fortune and misfortune.

From 1945 to 1970, timber harvest on Federal lands in the Basin increased about 5 percent per year, or 50 percent faster than the growth of the national economy. This increase was important

to the expansion of softwood and plywood production in the western United States, supporting many western communities. Nationwide, harvest volume from FS lands increased from 4 billion board feet in 1950 to 11.4 billion board feet in 1970; 90 percent of this came from western National Forests, and 41 percent from Washington and Oregon.

Currently, softwood timber harvest in the United States is projected to increase by 35 percent (0.6 percent per year), to 14.6 billion cubic feet by the year 2040. Since 1990, Federal harvests



Rivers were commonly used to float logs closer to the mill.

*Timber harvest in the Basin currently accounts for 10 percent of total United States harvest, down from 17 percent since 1986 and expected to decline to 5 percent by the end of the decade.*

have declined in the West; other regions, including Canada, have increased their shares of the U.S. market. In the Basin, 38 percent of the timberland is privately owned, and another 53 percent is administered by the FS or BLM. The national forests contain 89 million acres of commercial forestland and the BLM oversees management of about 6 million acres. Timber harvest in the Basin currently accounts for 10 percent of total United States harvest, down from 17 percent since 1986 and expected to decline to 5 percent by the end of the decade. Public harvest is currently 46 percent of total harvest in the Basin.

In recent years, the number of timber jobs in Idaho and Montana has slightly declined due primarily to technological improvements. Between 1985 and 1995, the number of timber industry jobs declined from 8,400 to 7,300 in Montana, but increased from 13,600 to 14,900 in Idaho. No such trend exists for eastern Oregon and Washington. Based on current harvest projections, modest employment declines are projected to continue due to related declines in timber harvest. More than 80 percent of the timber harvest in the Basin occurs in four economic areas—Spokane, Washington; Missoula, Montana; and Redmond-Bend and Pendleton, Oregon; this includes both private and public timber.

Much discussion in past years has focused on communities having high rates of employment in

the timber industry. Maintenance of stability in timber-dependent communities is often thought to be the responsibility of the FS despite their having no specific legal mandate to do so. No facts document a link between sustained timber flow and community stability.

In 1987, the FS identified 66 Basin communities as timber-dependent. Today, 29 exhibit characteristics indicating their sensitivity to Federal timber sales. These are isolated communities separate from fast-growing populations and economies in the Basin. Communities in the Clearwater Valley of Idaho are an example of towns in such regions. Federal policies toward such communities are more accurately viewed as political, not economic, reflecting political preferences about equity or distribution of wealth. Given that human populations in the Basin are expected to double over the next 50 years, the notion that any community may maintain stability is questionable. The more appropriate question is, “What attributes of communities and their economies contribute to quality of life and best accommodate change?”



High wheel logging near Bend, Oregon circa 1922.

## Implications for Ecosystem Management

Peoples' uses and perceptions of Basin resources have changed dramatically in a relatively short time period. Initially viewed by Euro-American settlers as unpriced, seemingly limitless supplies to be disposed of efficiently, many natural resources are now increasingly scarce and subject to highly competing uses. Federal laws and policies regarding resource use reflect the changes in both the supply of resources and public perceptions of their values. The industries that led to settlement and infrastructure development of the Basin—mining, timber, ranching, and transportation—still play critical roles in the social and economic functioning of Basin ecosystems, but those roles have changed with time and new industries have grown tremendously.

The rapid growth in the Basin's population presents major challenges to the Bureau of Land Management and Forest Service. Recent and projected population growth is most dramatic in metropolitan areas and locations with high levels of environmental amenities. In these areas, the growth and consequent development threaten the qualities that make such places attractive for recreation, retirement and new businesses. At the urban-wildland interface, where such growth is most dramatic and development most visible, habitat fragmentation and fire protection are critical issues.

The relationships between public land management and the resiliency of small, rural Basin communities continues to be a critical issue. The current pace and nature of changes in the Basin suggest that the manner in which the Forest Service and BLM interact with communities be carefully reviewed. Old patterns of behaviors that characterized land management priorities may

*People are seeking to define a variety of roles in decision-making and methods of making sure their concerns are heard and treated fairly.*

no longer serve the interests of many community residents. Policies to promote community stability may be inappropriate under conditions where there is little stability to be found in the social system. Economic analyses may be important to conduct not just at the regional scale but at a county and community scale as well. Each level of analysis has its own most appropriate uses, but a different story is told at each scale—each a crucial part of the ecosystem at that scale.

For example, at the Basin-wide or BEA region scale, economies are diverse and growing, but that growth is not shared equally among all communities in the larger regions, nor among all natural resource industries and the people within them. At larger scales, actions taken by the Forest Service or BLM have little effect on regional economies, but this is not the case at the community scale. Multiple factors play into the economic status of individual communities—including many that are not determined by the agencies, or even by community residents themselves. This has led in many cases to perceptions that a community's future is outside its control, but a growing number of Basin towns or groups of towns are dealing with this by developing strategic plans and visioning processes to become more economically diverse and socially cohesive.

*The industries that led to settlement and infrastructure development of the Basin—mining, timber, ranching, and transportation—still play critical roles in the social and economic functioning of Basin ecosystems, but those roles have changed with time and new industries have grown tremendously.*



The future of small, rural communities, both in the Basin and elsewhere, depends on a combination of factors, some within and some outside of the control of local residents.

Environmentally-based amenities managed by the Federal Government play many social and economic roles in the Basin. Despite the importance of amenities such as recreation opportunities and scenery, systems to map and inventory these values and requisite funding are not well integrated into current agency planning systems at ecoregion scales.

The public is assuming a more active role in public land management, whether or not the opportunity is provided by the Federal Government. People are seeking to define a variety of roles in decision-making and methods of making sure their concerns are heard and treated fairly. Natural resource agencies frequently find themselves in situations where goals of resource management are con-

tended, with a variety of potential futures described by conflicting groups.

The emerging issues represent differing values regarding what benefits society should receive from public lands. At the same time, people are looking to science to provide many of the answers and seem willing to trust credible analyses of existing conditions and potential cures. People show a willingness to trust the results of scientific study of ecosystems, but they have varying levels of trust in scientists employed by different institutions. There is recognition that science can provide

***There is recognition that science can provide many types of data and analyses, but people and the institutions we have created make decisions about how to use those findings.***



Field trips are a particularly effective technique for establishing dialogue to gain a common understanding of ecosystem issues.

many types of data and analyses, but people and the institutions we have created make decisions about how to use those findings. Ecosystem management's explicit attempt to blend science and values is both its strength and one of its greatest challenges.

In addition, there is often little agreement about cause-effect relationships; forest health is an example of a debate among scientists about the causes and effects of forest decline. In these situations, collaborative learning processes may be more suitable as a planning paradigm than other techniques. Public participation procedures for ecosystem management could focus on learning, recurrent interaction among participants, and increased opportunities for working through complex problems to identify possible solutions. Perhaps one of ecosystem management's functions

will be to clarify the role of the public in public land management.

Finally, ecosystem management may require review of the adequacy of existing institutions to support successful implementation. Institutions such as laws and procedures for conducting and evaluating public participation programs, coordinating across jurisdictions, and even conducting internal agency procedures may need to be re-examined. This societal examination of institutions, and how it is conducted, is expected to be a key factor in determining the success of ecosystem management.





Kootenai Falls in northwestern Montana is of utmost significance to the Kutenai Indians, who believe that the Creator and his divinities reside there. The Falls area has been a vision questing site for generations.