

CHAPTER 3

CURRENT STATUS OF THE BASIN



This chapter describes the current status of the Basin. First, it paints the Basin in a broad brush, describing its physical features and some of the historical trends influencing current conditions. It sets the national and global context for management of FS- and BLM-administered lands in the Basin. It describes the ownership of land in the Basin, and illustrates the different ecological and economic areas that the SIT used to study Basin processes in greater detail. Finally, the chapter distills information on the current status of the Basin from each of the science staff areas: landscape ecology, aquatic/riparian ecology, terrestrial ecology, economics, and social science. Maps, figures, and tables are drawn from the individual assessments of ecosystem components, which is where much greater detail may be found describing conditions within the Basin. These reports are assembled in the *Component Assessment*.

Overview

The total assessment area of the Basin is 144.2 million acres (58.4 million ha), 76.2 million acres (30.9 million ha) of which are administered by 35 National Forests and 17 BLM districts (fig. 8, and table 4). The remaining area is divided among other Federal, state, county, and tribal governments and private land owners. The combined land administered by the BLM and the FS comprises about 53 percent of the total assessment area. Data were collected from an area somewhat larger than the assessment area to assist in land-

scape characterizations. Ownership differs substantially across the ERUs as shown in figure 9 (table 5). The proportion of each ERU administered by the FS or BLM is above average in the Central Idaho Mountains, Northern Great Basin, Lower Clark Fork, and Owyhee Uplands ERUs. The Columbia Plateau has the highest proportion of private owners, and the smallest percent of FS- and BLM-administered lands.

Among the forested ERUs, the FS and the BLM administer the largest proportion of area in the Central Idaho Mountains where they manage 81 percent of the land base. The FS and BLM administer the least proportion of area in the Northern Glaciated Mountains (FS and BLM manage 39%); and private ownership is the greatest in the Upper Klamath (50% private). Among the non-forested ERUs, the FS and BLM administer the greatest proportion of area in the Northern Great Basin (73% FS- and BLM-administered, 21% private), and the least in the Columbia Plateau (12% FS- and BLM-administered, 76% private).

Vegetation is mapped into potential vegetation groups (PVG) that have similar environmental conditions and are dominated by similar vegetation (for example, the dry shrub PVG). They are often grouped by similar types of life forms. The PVGs found in the Basin and their relative proportions are shown in table 6.

The lands in the Basin are highly diverse. They range from the crest of the Cascades to the continental divide in the Rocky Mountains. The Basin contains some of the most majestic mountain

Table 4—Ownership of lands within the Basin assessment area.

Ownership	Lands		
	-----acres-----	---hectares---	--percent--
BLM- or FS-administered lands	76,274,273	30,867,100	53
Other Wilderness and National Parks	1,599,761	647,400	1
Private and other lands	54,666,141	22,122,600	38
State and other Federal lands	6,236,940	2,524,000	4
Tribal lands	5,437,061	2,200,300	4
Basin total	144,214,176	58,361,400	100

Note: Areas generated from 1 sq. kilometer grid using Geographic Information System. Totals will not match official Government Land Office totals.

landscapes in the nation. The Bitterroot, Selkirk, Steens, Cabinet, Salmon River, Lemhi, and Purcell mountain ranges commonly have elevations over 5,000 feet (1,524 m). Within these ranges, the valley bottoms can be low (725 feet/225 m) and the topography steep (McKee 1972). In contrast, much of the Klamath Basin is considered high desert with valley elevations generally over 4,000 feet (1,200 m). These mountains and valleys are underlain by metamorphosed schists and gneiss, marine sedimentary rocks, granitic batholiths, bedded sandstone, basalt, and belt series meta-sediments (Baldwin 1959, McKee 1972). Most have been altered by mountain and continental glaciation (McKee 1972).

In eastern Washington, northern Idaho, and western Montana, many of these mountains and valleys are covered with volcanic ash. During the last 4,000 years, volcanoes of the Cascade Range have erupted about twice per century. Effects of blasts, lava flows, floods, or other volcanic deposits are extensive. The ash deposits produced highly productive soils with excellent water-holding characteristics (Geist and Cochran 1991). In contrast, many of the soils derived from the batholith in central Idaho are very droughty and highly erosive (Ross and Savage 1967). The parent materials of the Klamath Basin developed into

a variety of young soils, many with a pumice mantle (Geist and Cochran 1991).

In addition to the mountains and valleys of the Basin, there are vast plains, prairies, deserts, and rolling hills. Many of these features are the result of basalt flows. Twenty-five million to twelve million years ago, these flows created a broad basalt plateau that covered more than 26 million acres (10 million ha) in eastern Washington and Oregon and southern Idaho (McKee 1972).

From 18,000 to 14,600 years ago, a series of floods from glacial Lake Missoula scoured much of eastern Washington, removed topsoil, and eroded the underlying basalt (Allen and others 1986, Dietrich 1995, McKee 1972, USDI 1982). Silt and fine sand outwash from glaciers and glacial outburst floods were entrained by wind and redeposited as thick blankets of loess. Sequential layers of loess cover much of the Columbia Valley, Columbia Plateau, and Snake River Plain. These areas support much of the dryland and irrigated agriculture in the region.

The plains of southeastern Oregon, which are encompassed by the Great Basin, are primarily a series of depositional landscapes. Scores of lakes developed in the Great Basin during the Pleistocene

Figure 8—Major land ownerships within the Basin.

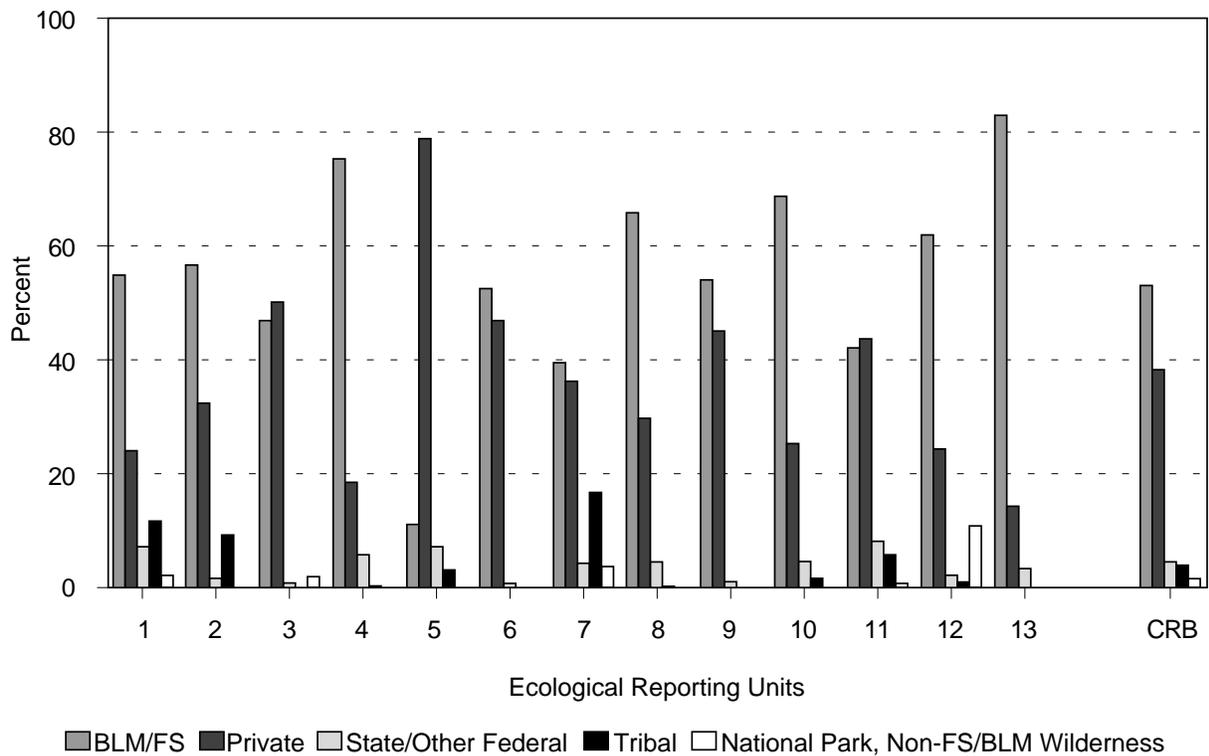


Figure 9—Percentage of Ecological Reporting Unit area by land ownership.

(Smith 1978). The largest of these, such as Bonneville and Lahontan Lakes, covered much of northwestern Utah, northwestern Nevada, and portions of southeastern Oregon (Harper and others 1994).

The climate in these landscapes varies, depending on elevation and the location of the site in relation to the rain shadows caused by the Cascades, Bitterroots, Salmon River, and other major north-south mountain ranges (Cooper and others 1987, Finklin 1983, Finklin and Fischer 1987, Franklin and Dyrness 1973, Graham 1990, Pfister and others 1977, Steele and others 1981). The landscapes of the prairies, deserts, and plateaus and distribution of vegetation vary depending on the soils, long-term precipitation patterns, and climate. They are often highly diverse and productive biospheres (Dietrich 1995, McKee 1972, Schwantes 1991).

The soils and climate of the mountain landscapes support vegetation ranging from moisture-loving species like western hemlock, western red cedar, and huckleberries to dryland species like sagebrush and Idaho fescue (Cooper and others 1987, Franklin and Dyrness 1973, Pfister and others 1977, Steele and others 1981). In the mountains of the Basin, tree species range from mountain hemlock and subalpine fir at the higher elevations to ponderosa pine in the valley bottoms. Mixed conifer forests dominated by white fir, grand fir, or Douglas-fir occupy many of the mid-elevation forests. Lodgepole pine forests occupy large portions of the Basin.

Huckleberries, buck brush, alder, and sagebrush are some of the shrubs present in the forests of the Basin. Manzanita is more common in the forests of the Klamath Basin than in other regions (Franklin and Dyrness 1973). In addition, juniper, bitter brush,

Table 5—Land ownership, by Ecological Reporting Unit for the Basin assessment area.

ERU	Ownership/Administration					Total land area
	FS/BLM	Other Wilderness/ National Parks	Private	State/ other Federal	Tribal	
----- hectares -----						
1. Northern Cascades	1,399,800	54,100	609,300	181,300	296,800	2,541,300
2. Southern Cascades	768,700	0	440,300	20,200	126,200	1,355,400
3. Upper Klamath	737,700	31,300	786,600	11,800	0	1,567,400
4. Northern Great Basin	3,160,300	0	782,500	240,300	7,200	4,190,300
5. Columbia Plateau	1,053,600	800	7,514,700	674,900	282,600	9,526,600
6. Blue Mountains	2,667,900	0	2,378,100	35,200	600	5,081,800
7. Northern Glac. Mtns	2,734,200	256,400	2,500,800	294,000	1,155,200	6,940,600
8. Lower Clark Fork	1,782,000	0	803,000	120,100	3,400	2,708,500
9. Upper Clark Fork	1,238,100	0	1,033,900	19,800	1,900	2,293,700
10. Owyhee Uplands	5,452,500	0	2,002,200	355,300	117,000	7,927,000
11. Upper Snake	1,427,700	21,400	1,483,800	275,000	185,000	3,392,900
12. Snake Headwaters	1,635,400	283,200	639,100	55,400	24,400	2,637,500
13. Central Idaho Mtns	6,809,200	200	1,148,300	240,700	0	8,198,400
Basin total	30,867,100	647,400	22,122,600	2,524,000	2,200,300	58,361,400

(Source: Basin GIS data, converted to 1 sq. kilometer raster data)

and associated bunch grasses occupy many of the drier sites of the Basin. Included in these mosaics of vegetation are rich riparian areas that support willow, brome grass, and other similar species (Clary and McArthur 1992). Prior to cultivation, sagebrush and grasses dominated the prairies and plains (Daubenmire 1970).

Many species of wildlife inhabit the mountains and valleys of the Basin. Grizzly bears, black bears, mountain lions, and salmon exist within the Basin along with such highly prized game species as Rocky Mountain elk, mule deer, and white-tailed deer. The bald eagle and northern goshawk are important raptors that prey on squirrels, chip-

munks, woodpeckers, and a host of other species (Reynolds and others 1992). The ecosystems of the Basin also support a multitude of other vertebrate and invertebrate species.

The Columbia River and its tributaries wind their way through this varied landscape. The source of the river is Lake Columbia in British Columbia, Canada. The river falls over 2,450 feet (750 m) between its source and the Pacific Ocean—four times the fall of the Mississippi River in half the distance. Before the construction of the dams, the Columbia River carried 7.5 million tons (7 million metric tons) of sediment to the sea every year (Dietrich 1995).

Table 6—Summary of potential vegetation groups within the Basin.

Potential vegetation group	Assessment area
	--percent--
Agricultural	16.1
Alpine	0.2
Cold Forest	9.9
Cool Shrub	7.8
Dry Forest	17.7
Dry Grass	4.0
Dry Shrub	22.8
Moist Forest	17.9
Riparian Shrub	0.5
Riparian Woodland	1.3
Rock	0.2
Urban	0.2
Water	0.9
Woodland	0.6
Basin total ¹	100.0

Note: Data from report Ah44; 01-May-96.

¹Total not exactly equal to 100 due to rounding.

Improvements to facilitate Columbia River navigation began in 1876 with the construction of locks and canals. The first large-scale dam, Minidoka, was built on the Snake River in 1909 by the Bureau of Reclamation. Dams like the Bonneville (1938) and Grand Coulee (1941) were the beginning of a 28 major dam system on the Columbia River and its tributaries. By 1975, the waterway between Lewiston, Idaho, and the Pacific Ocean had become a series of reservoirs. This dam system provides electricity throughout the Northwest, navigation and irrigation benefits, flood control, and recreational opportunities.

Agriculture, including irrigated and dryland farming and livestock production, is common in the

valley and plateau regions. Today, some rural and natural settings within the Basin have given way to expanding population centers; such as Bend, Oregon; Boise and Coeur d'Alene, Idaho; Missoula, Montana; Pasco/Kennewick/Richland ("Tri-Cities"), Spokane, Wenatchee, and Yakima, Washington.

Context

The Columbia River Basin is part of larger natural and human systems. Studying the Basin by itself provides valuable information, but its economic, cultural, and ecologic significance goes beyond its own borders. It influences, and is influenced by, activities occurring within the United States, North America, the Pacific Rim, and the world. National and worldwide status and trends in population, resource use, and energy consumption are examples of factors that may affect conditions, options, and outcomes within the Basin. New technologies and efficiencies developed elsewhere change resource flows, limits, and use. Examining some of these factors provides context for this document, and for the ICBEMP.

Land area

The Basin covers about 8 percent of the United States land area and, at about 225,000 square miles (58.4 million ha), is just 20 percent smaller than Texas (all comparisons to the U.S. refer to all 50 states, unless noted otherwise). The Basin encompasses 24 percent of the National Forest System lands and 10 percent of the BLM-administered lands in the nation. Approximately 20.5 percent (11.5 million acres/4.68 million ha) of the acreage with American Indian reservations in the United States is also located in the Basin; of that, 2.2 million acres (0.9 million ha) are tribal lands within reservation boundaries. Designated wilderness, present in 46 of the 100 counties in the Basin, totals 10.3 million acres. As of 1990, the National Wilderness Preservation System (all agencies) totaled 92.2 million acres (37.3 million

ha), with Alaska accounting for 57.1 million acres (23.1 million ha) of the total (Hendee and others 1990, in Cabbage and others 1993). Thus, the Basin includes 29 percent of wilderness acres within the contiguous United States.

Population

The total 1990 human population in the Basin was 2,913,927 about 1.2 percent of the nation's population (McGinnis and Christensen, in press) living on 8 percent of the nation's land base. The American Indian population by tribal membership is 64,000, which is 5.4 percent of the 1993 nationwide total. In the Basin, there are 22 federally recognized tribes, of 554 nationwide.

In a nation that has become largely urban, the Basin is strikingly rural. Over 77 percent of the U.S. population lives in urban areas; in the 13 western states⁵ the percentage is even higher (84.6%) (Krannich and others 1994). By contrast, only 31 percent of the population in the Basin lives in urban areas, none of which contains more than 1 million people; only 6 of the 100 counties are considered metropolitan (McGinnis and Christensen, in press).⁶ Sixty counties are in the most rural category defined by the Census Bureau (non-metropolitan), are not adjacent to a metropolitan county, and do not contain a community of at least 10,000 people. These 60 counties account for less than 25 percent of the Basin population.

Population density on non-public lands within the Basin is less than a third of the U.S. average: on average, 20 people dwell in 1 square mile (8/km) within the Basin as opposed to 70 people per 1 square mile (27/km) for the nation. Including

Federal lands decreases population density to 11 people per 1 square mile (4/km). Sixty-two percent of the population within the Basin lives in communities of less than 10,000 people, in unincorporated places, or in open countryside--higher than the 43 percent average for the United States. These average population densities mask tremendous variation across the Basin, from fewer than 1 person per 1 square mile (0.26/km²) in Clark County, Idaho, to as high as 338 people per 1 square mile (132/km) in Ada County, Idaho.

People living in the Basin are similar to other people in the United States in age structure, educational attainment, occupational distribution, and sources of income--although variation exists across the Basin. The Basin has a slightly higher percentage of people under the age of 18 than the U.S. average (28.9 versus 25.6%) and a lower percentage of people in the prime wage-earning years of 25 to 49 (36.0 versus 38.0%). Forty-eight percent of those people living in the Basin have achieved at least some level of higher education compared with 45 percent in the United States, suggesting it has a high-quality workforce. The racial and ethnic composition of the Basin is quite different from the rest of the country. Generally, the Basin has a higher percentage of Caucasians than the United States (91.7 versus 80.3%); it also has a greater proportion of Native Americans (2.4 versus 0.8%) and a smaller proportion of African-Americans (0.6 versus 12.1%), Hispanic Americans (6.7 versus 9.0%) and Asian Americans (1.1 versus 2.9%).

Recreation

There are about 4 acres (1.6 ha) of designated wilderness, national parks, and national recreation areas per person in the region compared with a national figure of 0.6 acres (0.24 ha). The relative rate of participation in outdoor recreation is higher than in other regions of the nation. Visits of over 200 million recreation activity days per year were made to Federal lands in the Basin. Currently there is a great deal of recreation activity in the Basin, averaging 31.5 recreation visitor days

⁵The West Census region includes Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

⁶The Census Bureau defines a metropolitan county as one in a metropolitan statistical area (MSA). An MSA has a population of at least 100,000 and includes a large population center of at least 50,000 and adjacent communities that are economically and socially integrated with it. The metropolitan counties in the Basin are: Benton, Franklin, Spokane, and Yakima Counties (Washington), and Ada and Canyon Counties (Idaho) (McGinnis and Christensen, in press).



Photo by J. Mikowski

Photo 5. Roads provide access for a wide array of uses including cold water fishing.

(RVDs) per resident compared to a national average of 22.3 RVDs. Since 1980, RVDs of FS-administered lands in the Basin have increased 2.3 percent per year; at these growth rates recreation use will double every 31 years. Photo 5 illustrates the highest valued recreational activity in the Basin. Detailed data on recreation activities and use are given in the *Component Assessment--Economics* (Haynes and Horne 1996).

Forestry

The forests of the Basin are categorized as temperate forests. Although there is a worldwide concern about deforestation, the temperate forests have actually increased in area (Brooks 1993). In the Basin, the total area in forest has remained relatively constant during the last two centuries (*Component Assessment--Landscape Ecology*, Hann and others 1996). Broad indicators of sustainability indicate that Basin forest acreage and inventory volumes are relatively constant. The Basin currently supplies about 10 percent of the total U.S. timber production, but this proportion has been

declining since the early 1960s (fig. 10). This has resulted from increases in timber harvest in the southern United States and in Canada. These same trends are expected to continue (Haynes and others 1995).

Table 7 shows Basin forests and human populations in a national, continental, and global context. It illustrates that the Basin is relatively sparsely populated and well endowed with forests. In examining the number of forested hectares per person, it is important to consider the totality of values that forest ecosystems represent to people.

Forests (all ownerships) cover one-third of the total land area in the United States, about 737 million acres (298 million ha). Powell and others (1993) have summarized the forest resources of the United States. Some 490 million acres (198 million ha) of that is classified as timberland, that is, forestland capable of producing at least 20 cubic feet of industrial wood per year, and not reserved for uses incompatible with timber pro-

Table 7—Population, population growth rate, forest area, and forest area per capita, 1990.

Area	Population	Annual population growth	Forest area	Forest
	---millions---	---percent---	--million hectares--	--hectares/person--
Asia	3,071.6	2.0	484.5	0.16
Latin America	448.3	2.0	919.4	2.05
Africa	647.3	3.0	604.3	0.93
North America	275.7	1.0	751.4	2.73
Nordic	17.8	0.1	61.0	3.43
Europe	547.1	0.2	134.0	0.24
C.I.S.	287.7	0.7	941.5	3.27
Oceania	20.4	0.2	153.1	7.50
World	5,316.1	1.7	4,047.1	0.76
United States	248.7	0.8	298.1	1.20
Basin area	2.9	0.7	66.7	22.23

Note: Asia includes tropical and temperate zone countries. North America excludes Mexico. Nordic is Finland, Norway and Sweden. Europe category excludes Nordic countries and C.I.S. countries, includes Turkey. C.I.S. is Commonwealth of Independent States. Oceania is Australia and New Zealand only.

Sources: Haynes and Brooks (in press); Haynes and Horne (1996)

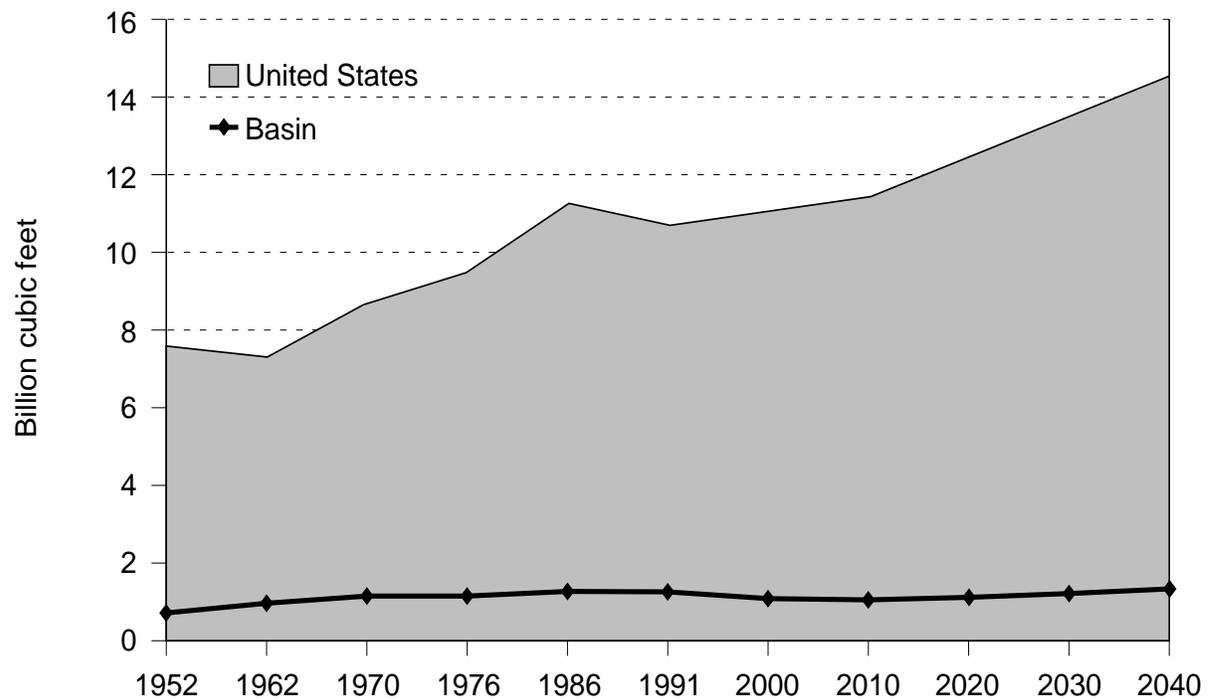


Figure 10—Historic and projected softwood timber harvest in the United States and in the Basin, 1952-2040.

duction. Almost all U.S. timberland is in the temperate zone and temperate tree species used for commercial purposes. Hardwoods, mostly in Washington and Oregon, occupy only 12 percent of the West's timberland. The forest inventory data suggest that forestland management in the United States is generally sustainable, but there are still unresolved issues such as biodiversity, soil depletion and productivity, lack of certain seral stages, and loss of what is publicly perceived as nonrenewable forest resources (such as Douglas-fir old-growth). About 73 percent of U.S. timberland is held in private ownership (358 million acres/145 million ha). The remaining 27 percent is held or administered by various public owners, with about 17 percent in national forests, 3 percent in other Federal ownership, 6 percent in state holdings, and 2 percent under county and municipal control. Timberland under American Indian sovereignty accounts for about 1 percent and is included in the category of private timberlands. Ownership of timberland areas varies substantially across the regions of the United States (table 8). In the Basin, private ownership accounts for 38 percent of the timberland, and 53 percent is FS- and BLM-administered. The other 10 percent is owned by state, and other governments and agencies. The national forests contain 89 million acres (36 million ha) of commercial forestland; the Bureau of Land Management (BLM) oversees management of another 6 million acres (2.4 million ha).

Range

Cattle grazing has been an important part of the Basin's economy since just after the Civil War. In 1992, the Basin accounted for four percent of the cattle inventories in the United States. More than 60 percent of this inventory is concentrated along the southern edge of the Basin coincident with the range PVGs. In general, cattle inventories in the Basin have fallen over the past four decades reflecting both changes in consumer tastes towards high-quality grain-fed beef and the development of large feedlot operations in the Great Plains states (Glover and Southard 1995).

The productivity of western rangelands is extremely variable; the better desert sites in Oregon and Washington produce up to 250 pounds of forage per acre, while grasslands may produce up to 5,000 pounds per acre (Joyce 1989). Rangeland condition has changed dramatically throughout the western states since Europeans first appeared. Misuse and overuse caused range conditions to be most degraded around the turn of the century, but range conditions have been improving in most areas since the 1930s (Joyce 1989).

There are 2.9 million Federal AUMs⁷ in the Basin (see *Component Assessment--Economics*). The FS accounts for 45 percent (35% in the upper Basin and 10% in the lower Basin) while the BLM accounts for 55 percent (38% in the upper Basin and 16% in the lower Basin). Reliance on Federal forage, defined here as the portion of total feed consumed by livestock provided by permitted use of FS and BLM lands, averages 7 percent for the Basin.

The degree of reliance on Federal AUMs is actually higher if the seasonal importance of Federal forage (which is at higher elevations and used for spring and summer grazing) is considered. For example, in the EIS we used a factor of 1.2 to estimate the effect of lost Federal AUMs. This was calculated from assumptions about the seasonal pattern herd size and extent of substitute feed during different grazing seasons.

Seven counties in the Basin had over 30 percent dependency on FS and BLM AUMs: Skamania, Washington (48%); Camas, Idaho (39%); Humboldt and Elko, Nevada (38% each); Custer and Clark, Idaho (36 and 34%, respectively); and Chelan, Washington (33%). Of the 100 counties in the Basin, 67 counties had less than 10 percent reliance on FS and BLM forage. Only five of the counties with over ten percent reliance on Federal grazing were large producers of cattle and calves (over \$25 million).

⁷An AUM is the amount of forage required to sustain one cow, five sheep, or five goats for one month; forage includes grazed forage, hay, crop residue, silage, or grain.

Threatened and endangered species

There are over 17,000 known taxa within the Basin; there are 609 known vertebrate taxa within the Basin as compared with 45,000 vertebrate taxa globally (table 9). The Basin is home to 29 threatened or endangered species (table 10). Eleven percent (11 out of 100) of fish taxa found in the assessment area are listed nationally as threatened or endangered under the Endangered Species Act (1973) by the Federal Government. The Columbia River Basin has relatively high diversity of fish species compared to other parts of the West (Great Basin, Colorado River, and others are lower), but lower when compared to eastern and Midwest

states (such as states in the Mississippi drainage). Overall, from an aquatic standpoint the assessment area has a lower species diversity but higher endemism than the Mississippi drainage. The relative proportions of the threatened and/or endangered fish taxa are higher in the Great Basin and Klamath Basin portions of the assessment area than in the Columbia River Basin itself due in part to the greater degree of endemism in those areas.⁸

⁸Personal communication. June 18, 1996. Jack Williams, Bureau of Land Management. On file with: U.S. Department of Agriculture, Forest Service, U.S. Department of Interior, Bureau of Land Management, Interior Columbia Basin Ecosystem Management Project, 112 E. Poplar, Walla Walla, WA 99362.

Table 8—Areas of timberland in the United States by type of ownership and sections, 1992.

Type of ownership	Total United States		Region			
	Area	Proportion	North	South	Rocky Mt. Pacific Coast	
	Thousand ---acres---	---Percent---	----- Thousand acres-----			
National Forests	84,661	17.3	9,545	11,554	36,402	27,160
Bureau of Land Management	5,754	1.2	26	0	3,087	2,641
Other	6,239	1.3	1,252	4,456	253	278
All Federal	96,654	19.7	10,823	16,010	39,742	30,079
State	27,356	5.6	13,332	3,602	2,546	7,876
County and municipal	7,484	1.5	6,151	890	101	342
All public	131,493	26.9	30,306	20,502	42,388	38,297
Forest Industry	70,455	14.4	16,198	39,025	2,918	12,314
Farm	82,484	16.8	31,004	39,485	8,223	3,772
Miscellaneous private	205,121	41.9	80,290	100,297	9,098	15,436
All private	358,061	73.1	127,492	178,807	20,239	31,522
All ownerships	489,555	100.0	157,799	199,309	62,628	69,819

Source: Powell and others 1993.

Table 9—Counts or estimates of total species biota of the Basin assessment area, estimated total U.S. species, and global diversity of organisms.

Taxonomic group	Number of taxa in Basin		Global number of species	
	Known	Estimated	Described	Estimated
Plants and allies				
Fungi	3,000	9,000	70,000	1-1.5 million
Lichens	736	736		
Bryophytes	811	860		
Vascular plants	8,250	8,350		
Algae			40,000	200,000-10 million
Plants			250,000	300-500,000
Total plants and allies	12,797	18,946		
Invertebrates				
Bacteria	— ¹	—	4,000	400,000-3 million
Protozoa	—	—	40,000	100-200,000
Rotifers	—	—		
Nematodes	—	—		
Mollusks	380	770	70,000	200,000
Arthropods	3,400	23,500		
Viruses			5,000	perhaps 500,000
Roundworms			15,000	500,000-1 million
Insects			950,000	8-100 million
Spiders and mites			75,000	750,000-1 million
Crustaceans			40,000	150,000
Total invertebrates	3,780	24,270		
Vertebrates				
Fish--natives	87	87		
Fish--exotics	54	54		
Amphibians	26	26		
Reptiles	27	27		
Birds	283	283		
Mammals	132	132		
Total vertebrates	609	609	45,000	50,000
Total all taxa	17,186	43,825		

Note: Basin figures are number of taxa (mostly species, with a few subspecies of particular conservation concern); Basin fungi are macrofungi only. Global "Estimated" figures include undiscovered species.

¹ = No firm estimate available.

Source: Marcot and others (1996).