

# CHAPTER III

## *AFFECTED ENVIRONMENT*





## **BITTERROOT ECOSYSTEM OF CENTRAL IDAHO AND WESTERN MONTANA: THE REGION**

Both Idaho and Montana are large, sparsely populated, and mostly rural northwestern states (Table 3-19). The two states cover nearly 147 million acres (229,688 mi<sup>2</sup>). Of Idaho's nearly 53 million acres (82,813 mi<sup>2</sup>), almost 64% are federal lands. The USDA Forest Service (USFS) and U.S. Bureau of Land Management (BLM) manage over 20 million (31,250 mi<sup>2</sup>) and 11 million acres (17,188 mi<sup>2</sup>), respectively, in Idaho. Of Montana's nearly 94 million acres (146,875 mi<sup>2</sup>), nearly 29% are federal lands. The USFS and BLM manage nearly 17 million acres (26,563 mi<sup>2</sup>) and over 8 million acres (12,500 mi<sup>2</sup>) respectively in Montana.

In 1996, combined population for the two states was 2.07 million people or an average of 9.0 people per square mile (Table 3-19). In Idaho, the state population grew approximately 67% over a 26 year period from 713,015 people in 1970 (8.7 people/mi<sup>2</sup>) to 1,187,597 people (14.3 people/mi<sup>2</sup>) in 1996. Montana's population grew approximately 10% in a six year period from 799,065 people in 1990 (5.4 people/mi<sup>2</sup>) to 876,684 people in 1996 (6.0 people/mi<sup>2</sup>).

About 43% of Idaho's population is rural. Most of the population occurs in the southern, more developed part of Idaho. Boise, Idaho's capital, is the largest city with a 1996 population of 152,737 people, followed by Pocatello (51,344 people) and Idaho Falls (48,079 people). Montana also has a predominantly rural population (48%). Billings is the state's largest city with a 1996 population of 91,195 people, followed by Great Falls (57,758 people) and Missoula (51,204).

The Bitterroot Grizzly Bear Primary Analysis Area (PAA) is that area potentially affected by grizzly bear recovery in the Bitterroot Ecosystem (BE) of Idaho and Montana (Figure 3-1). The heart of the PAA is centered around the Wilderness Areas of central Idaho, while a small portion extends over the crest of the Bitterroot Mountains.

The PAA includes about 16,686,596 acres (26,072 mi<sup>2</sup>) of contiguous national forest lands in central Idaho and western Montana (Figure 3-2). These include the Bitterroot, Boise, Challis, Clearwater, Nez Perce, Payette, Sawtooth, Salmon, and Panhandle National Forests in Idaho, and the Bitterroot and Lolo National Forests in western Montana. A few scattered parcels of private and state land are interspersed throughout this area, but the total acreage is minor.

The center of the PAA is characterized by 3 wilderness areas covering a contiguous area of 3,902,912 acres (6,098 mi<sup>2</sup>). These include the Frank Church-River of No Return (2,361,767 acres; 3,690 mi<sup>2</sup>), the Selway-Bitterroot (1,340,681 acres; 2,095 mi<sup>2</sup>), and the Gospel Hump (200,464 acres; 313 mi<sup>2</sup>) Wilderness Areas (Figure 3-3).

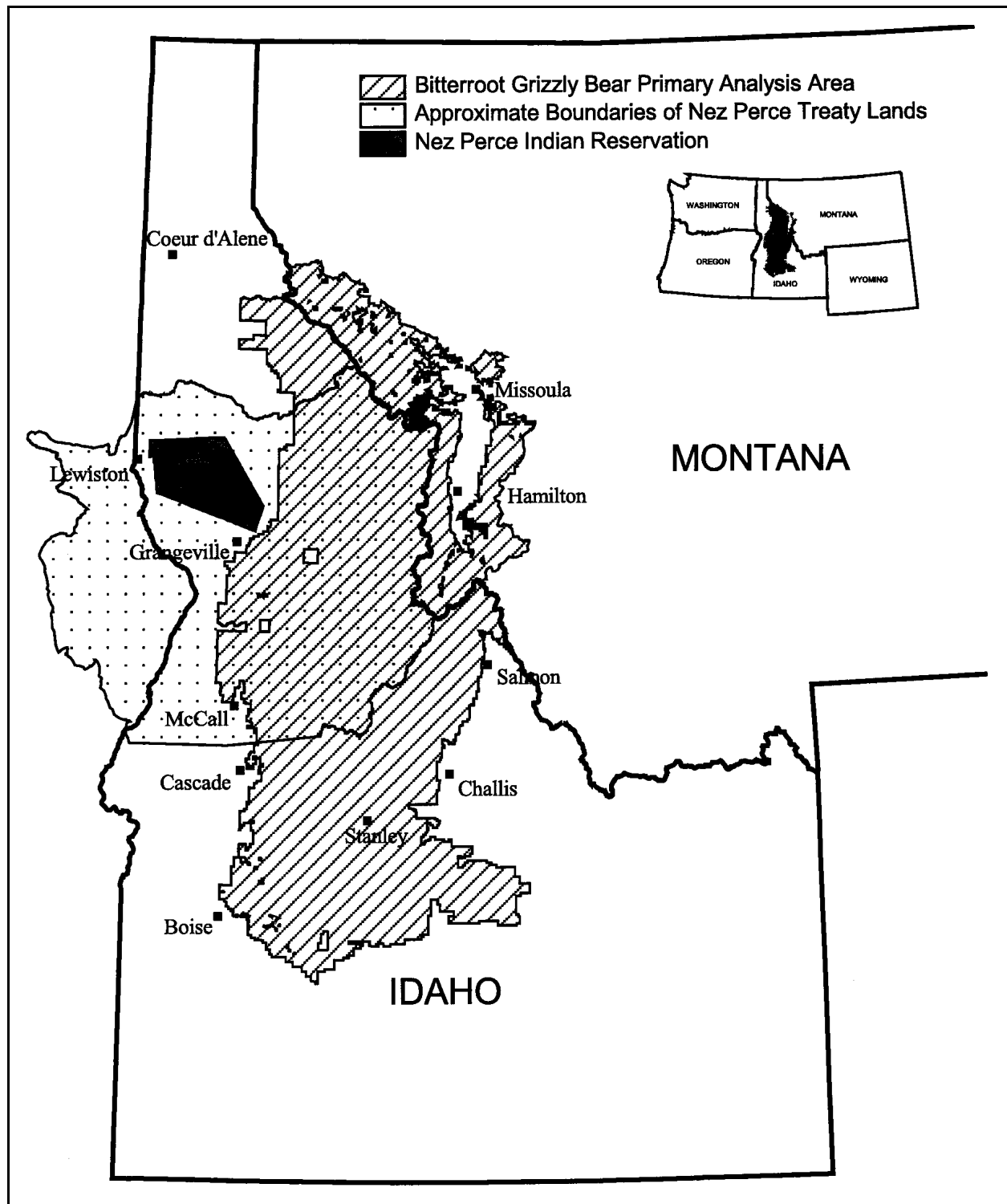


Figure 3-1. Location of the Bitterroot Grizzly Bear Primary Analysis Area, Nez Perce Indian Reservation, and approximate boundaries of Nez Perce treaty lands in Idaho.

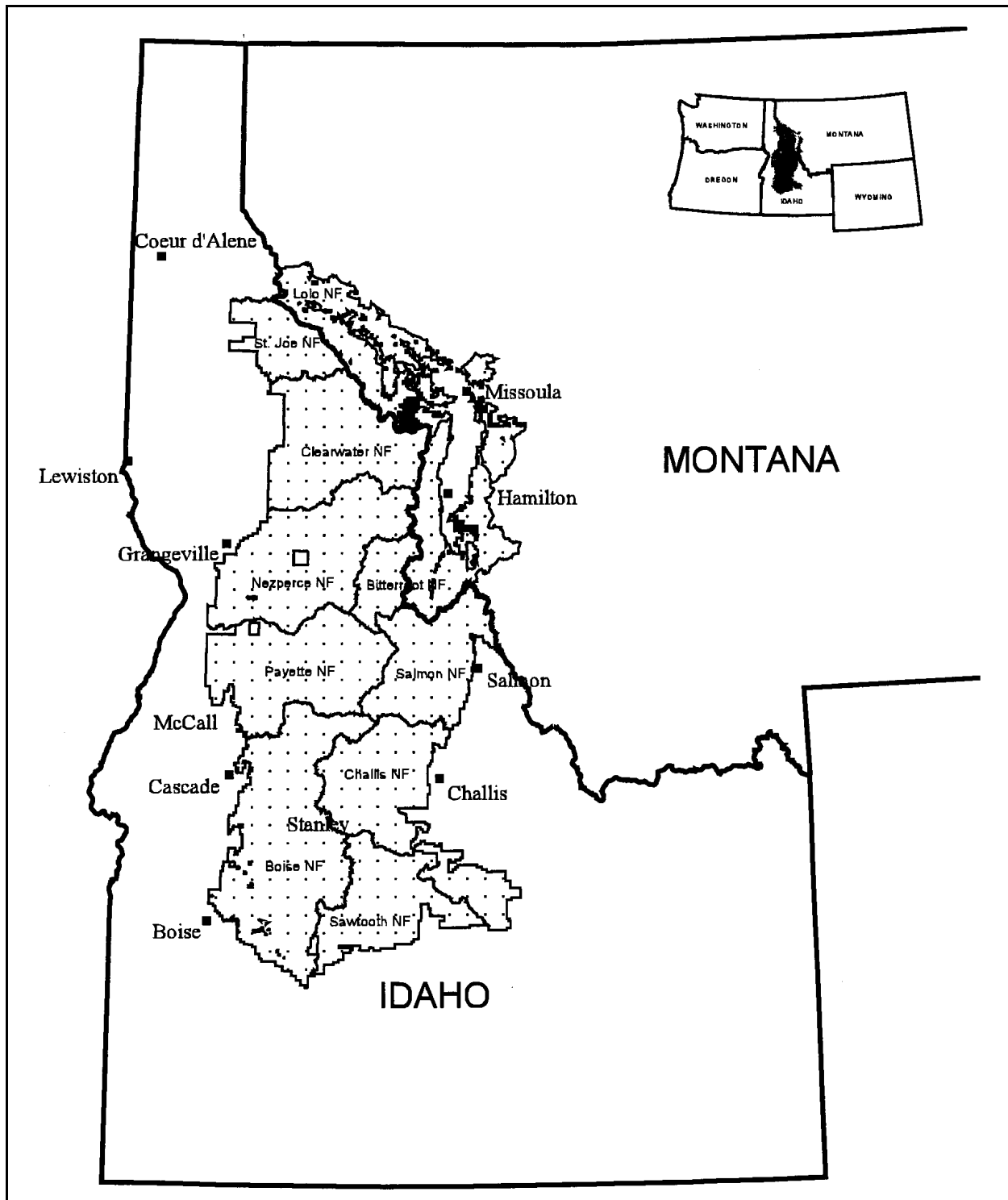


Figure 3-2. Ten contiguous national forests comprising the Bitterroot Grizzly Bear Primary Analysis Area.

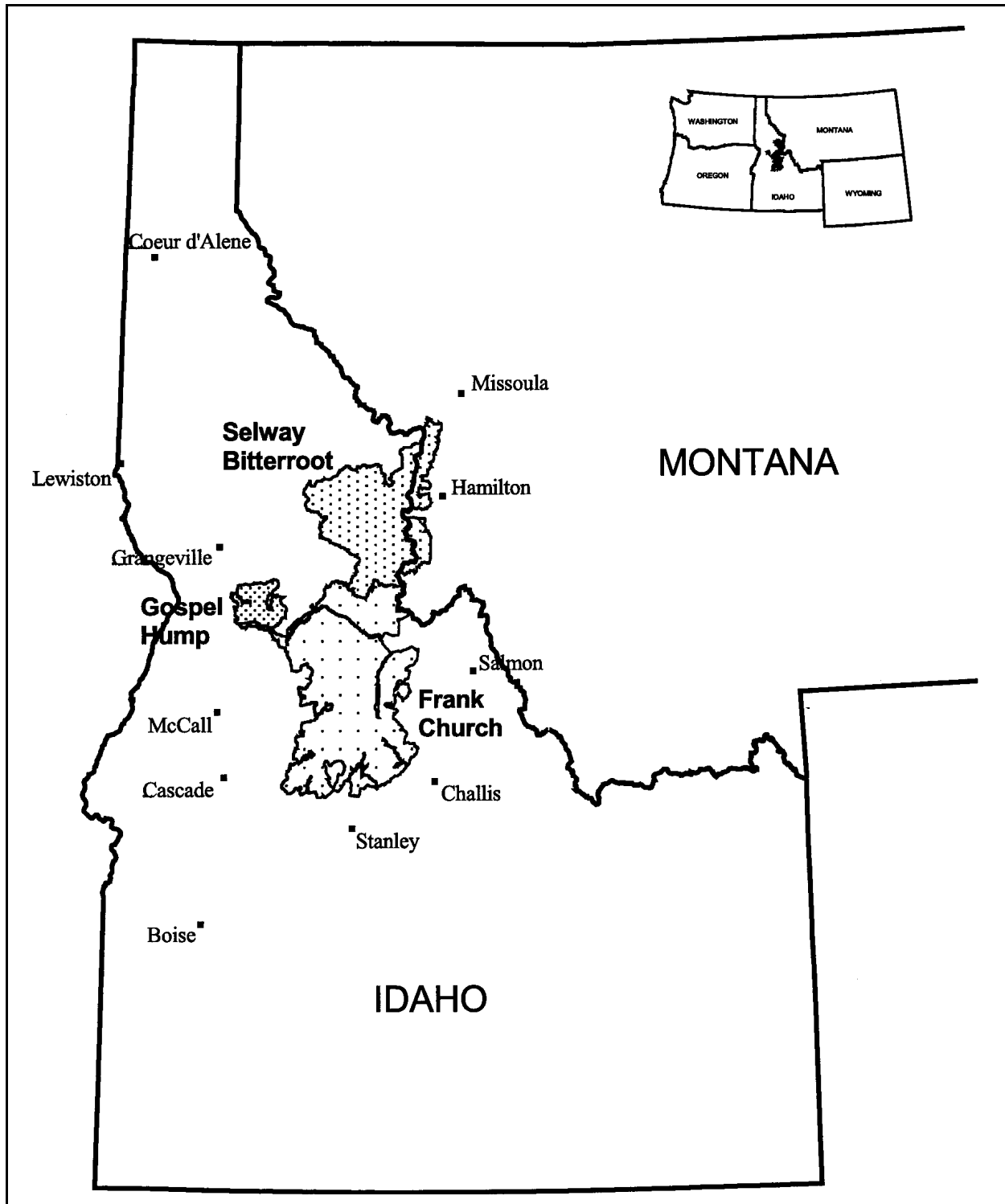


Figure 3-3. The three wilderness areas within the Bitterroot Grizzly Bear Primary Analysis Area: Selway-Bitterroot, Frank Church-River of No Return, and Gospel Hump Wilderness Areas.

## *Bitterroot Ecosystem - Regional Information*

The River of No Return Wilderness Area covers parts of Custer, Idaho, Lemhi, and Valley counties and is administered by 6 national forests, including the Bitterroot, Nez Perce, Boise, Challis, Payette, and Salmon. The Selway-Bitterroot Wilderness Area covers parts of Idaho and Clearwater counties in Idaho and parts of Missoula and Ravalli counties in Montana; and is administered by the Nez Perce, Clearwater, and Bitterroot National Forests. The Gospel Hump Wilderness Area is contained entirely within Idaho County and the Nez Perce National Forest.

Ten counties in central Idaho encompassing 22,687,424 acres (35,449 mi<sup>2</sup>) and four counties in western Montana encompassing 5,740,560 acres (8,970 mi<sup>2</sup>) are included in the PAA (Figure 3-4). Within this 14-county area, 18,489,989 acres (28,891 mi<sup>2</sup>; 65%) are managed by the USFS, 3,066,749 acres (4,792 mi<sup>2</sup>, 11%) are managed by the BLM, and 5,582,892 acres (8,723 mi<sup>2</sup>; 20%) are privately owned (Table 3-1).

Table 3-1. Land ownership estimates, in acres, by county in the Bitterroot Grizzly Bear Primary Analysis Area<sup>a</sup>.

| County     | USDA Forest Service | U.S. Bureau of<br>Land<br>Management | Private   | State     | Other <sup>b</sup> | Total      |
|------------|---------------------|--------------------------------------|-----------|-----------|--------------------|------------|
| Idaho      |                     |                                      |           |           |                    |            |
| Blaine     | 491,115             | 796,272                              | 319,014   | 60,321    | 26,013             | 1,692,736  |
| Boise      | 873,345             | 31,744                               | 194,676   | 86,393    | 31,442             | 1,217,600  |
| Camas      | 323,546             | 120,490                              | 216,419   | 25,075    | 2,470              | 688,000    |
| Clearwater | 792,191             | 12,677                               | 490,128   | 233,713   | 46,715             | 1,575,424  |
| Custer     | 2,123,657           | 813,041                              | 159,549   | 53,805    | 2,332              | 3,152,384  |
| Elmore     | 783,196             | 530,313                              | 415,382   | 124,338   | 116,563            | 1,969,792  |
| Idaho      | 4,429,429           | 93,319                               | 825,210   | 75,817    | 6,753              | 5,430,528  |
| Lemhi      | 2,073,219           | 579,405                              | 228,783   | 37,869    | 1,876              | 2,921,152  |
| Shoshone   | 1,199,775           | 70,100                               | 344,256   | 68,474    | 3,155              | 1,685,760  |
| Valley     | 2,029,724           | 5,093                                | 202,993   | 75,342    | 40,896             | 2,354,048  |
| Montana    |                     |                                      |           |           |                    |            |
| Mineral    | 646,889             | 0                                    | 113,847   | 21,984    | -                  | 728,720    |
| Missoula   | 693,027             | 14,295                               | 886,360   | 85,678    | -                  | 1,679,360  |
| Ravalli    | 1,116,162           | 0                                    | 371,239   | 38,126    | -                  | 1,528,320  |
| Sanders    | 914,714             | 0                                    | 815,036   | 64,564    | -                  | 1,804,160  |
| Totals     | 18,489,989          | 3,066,749                            | 5,582,892 | 1,051,499 | 278,215            | 28,427,984 |

<sup>a</sup> Idaho information from 1995 Idaho Department of Commerce data. Montana information from 1994 Montana Department of Natural Resources data.

<sup>b</sup> Includes: Bureau of Reclamation, United States Air Force, National Park Service, U.S. Army Corp of Engineers, USFWS, county, Tribal, and municipal lands.

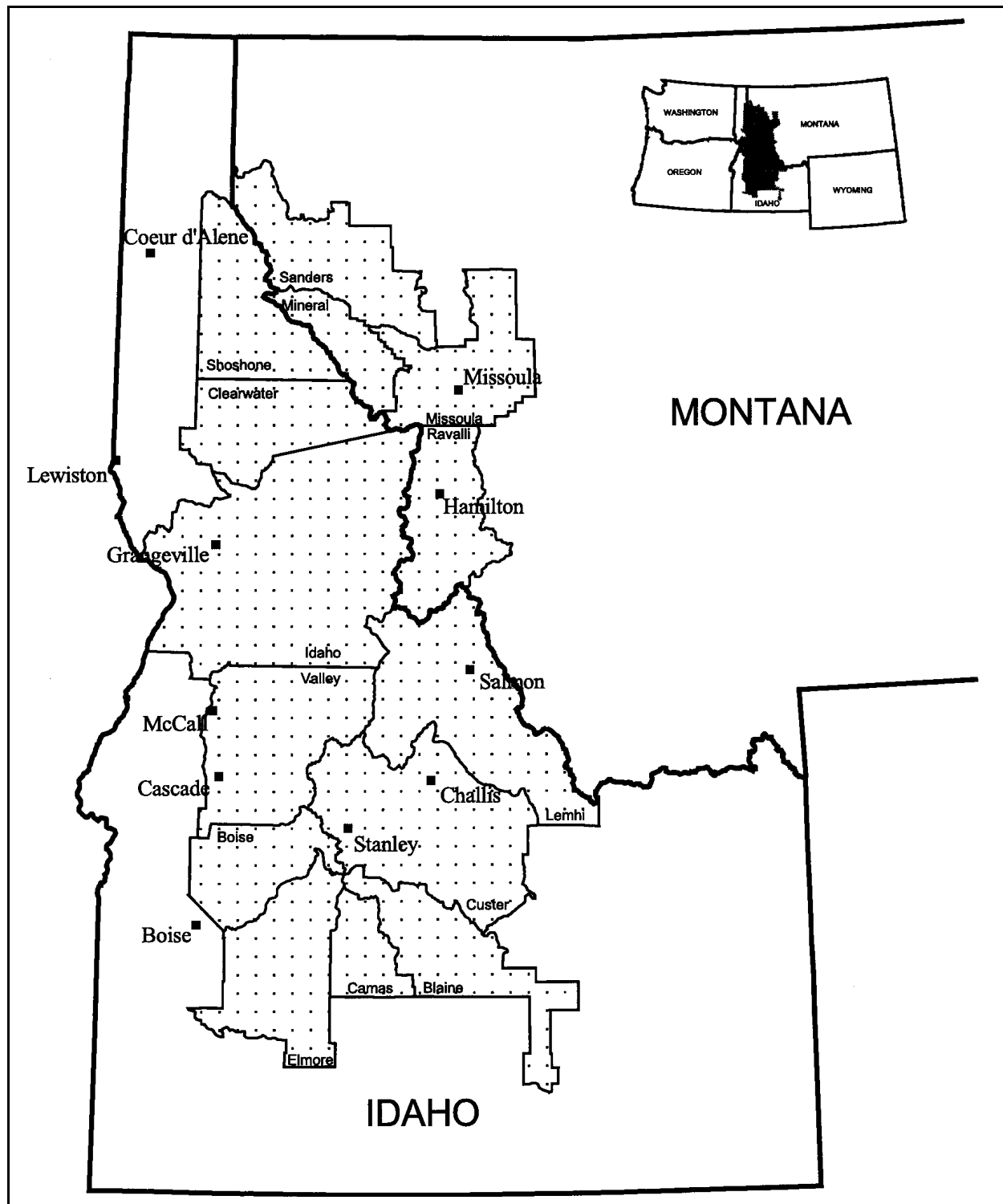


Figure 3-4. Fourteen counties in central Idaho and western Montana that are all or partly included in the Bitterroot Grizzly Bear Primary Analysis Area (the “fourteen-county area”).



### *Bitterroot Ecosystem - Regional Information*

The 14 counties support a population of 240,928 people at an average density of 5.4 people/mi<sup>2</sup> (Table 3-2). With the exception of Elmore County in Idaho, populations in all Idaho counties are >50% rural; and Boise, Valley, Camas, and Custer County populations are all considered 100% rural. The 14-county area supports 4,327 farms covering 2,751,743 acres (4,300 mi<sup>2</sup>; Table 3-2).

Table 3-2. Number and density of people and farms in 14 counties covering the Bitterroot Grizzly Bear Primary Analysis Area in central Idaho and western Montana.<sup>a</sup>

| Counties   | Area (mi <sup>2</sup> ) | Population | Density/mi <sup>2</sup> | Percent rural | Total farms | Total acres in farms |
|------------|-------------------------|------------|-------------------------|---------------|-------------|----------------------|
| Idaho      |                         |            |                         |               |             |                      |
| Blaine     | 2,645                   | 16,966     | 6.4                     | 53.0          | 195         | 214,985              |
| Boise      | 1,903                   | 4,908      | 2.6                     | 100.0         | 78          | 45,461               |
| Camas      | 1,075                   | 876        | 0.8                     | 100.0         | 98          | 127,514              |
| Clearwater | 2,461                   | 9,444      | 3.8                     | 63.4          | 210         | 73,103               |
| Custer     | 4,926                   | 4,357      | 0.9                     | 100.0         | 268         | 147,913              |
| Elmore     | 3,078                   | 23,778     | 7.7                     | 58.4          | 301         | 355,590              |
| Idaho      | 8,485                   | 14,879     | 1.8                     | 77.9          | 661         | 649,851              |
| Lemhi      | 4,564                   | 8,094      | 1.8                     | 56.0          | 308         | 196,584              |
| Shoshone   | 2,634                   | 13,975     | 5.3                     | 100.0         | 44          | 4,100                |
| Valley     | 3,678                   | 7,957      | 2.2                     | 65.6          | 119         | 64,282               |
| Montana    |                         |            |                         |               |             |                      |
| Mineral    | 1,223                   | 3,719      | 3.0                     | -             | 71          | 16,329               |
| Missoula   | 2,618                   | 88,271     | 33.7                    | -             | 482         | 262,419              |
| Ravalli    | 2,400                   | 33,550     | 14.0                    | -             | 1,080       | 183,647              |
| Sanders    | 2,790                   | 10,154     | 3.6                     | -             | 412         | 409,965              |
| Totals     | 44,480                  | 240,928    |                         |               | 4,327       | 2,751,743            |

<sup>a</sup> Idaho information from 1998 Idaho Department of Commerce data (for year 1996). Montana population information from 1998 Montana Department of Commerce data (for year 1996). Montana and Idaho farm information from 1997 Montana and Idaho State Census of Agriculture data (USDA National Agricultural Statistics Service).

A large proportion of the PAA lies within the ceded area of the Nez Perce Tribe (Figure 3-1). The Nez Perce Tribe is a federally recognized Indian tribe with a special trust relationship with the United States government and legal rights defined by treaties, federal statutes, court decisions and the U. S. Constitution.

The Tribe's original land base covered about 13,200,000 acres in north central Idaho, northeast Oregon, and southeast Washington. Most of the original land base was ceded to the U. S. government through treaties in 1855 and 1863. In those treaties, however, the Tribe retained the

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exclusive right of taking fish in all the streams running through or bordering the reservation, the right of taking fish at all usual and accustomed places in common with citizens, and the privilege of hunting, gathering roots and berries, and pasturing their horses and cattle upon open and unclaimed land.

Many of the resources still available to the members are on USFS or BLM lands within the ceded area. Tribal members, approximating 3,500, actively exercise their treaty rights throughout this area. Much of these treaty resources still available to tribal members sustain their culture and lifestyle.

### **Landscape**

The Northern Rocky Mountain physiographic province includes the mountain ranges of central Idaho and western Montana. The PAA contains 3 major mountain ranges; the Salmon River Mountains (south of the Salmon River), the Clearwater Mountains which extend from the Salmon River north to the upper Clearwater River drainage, and the Bitterroot Mountains which form the eastern border of the PAA along the Idaho-Montana border.

Most of the PAA is characterized by rugged terrain and steep slopes. Elevations range from about 1,500 feet along the Clearwater River in the northern portion to 12,662 feet on Borah Peak in the Challis National Forest near the southeastern portion of the PAA.

The area varies from deeply incised canyons formed by rivers cutting through rock, to rolling basin lands at higher elevations. Soils throughout the area are characterized predominantly by the Idaho batholith, a highly erosive and course-grained granite.

The southern half of the PAA drains water to the Salmon and Snake Rivers, while the northern half drains primarily into the Clearwater River. Both the Salmon and Clearwater Rivers empty into the Snake River along the western border of Idaho before the Snake empties into the Columbia River near Pasco, Washington. In total, the PAA provides over 19 million acre feet of water to the Columbia River system annually.

### **Climate**

Topography is the major modifying influence on climate throughout the PAA. Climate varies from the warm, dry Salmon River breaks to cool, moist subalpine areas. Annual precipitation varies from less than 8 inches at lower elevations to nearly 100 inches at high elevations. Most precipitation occurs during late fall through early spring. Precipitation at higher elevations is mostly in the form of snow.

Summers are dry with temperatures often exceeding 100 degrees F, and winters are long with sub-zero temperatures common. Extremes of -50 degrees F are occasionally reached.

Mean annual precipitation increases from the southern to the northern portions of the PAA. Highest annual precipitation (about 100 inches) is found on the Bitterroot Divide along the Idaho-Montana border in the Clearwater National Forest.

## **Vegetation**

Mountains of the PAA are covered by 3 major vegetation community types. The wide elevational range and accompanying climatic variations result in diverse flora. The grand fir/Douglas-fir, Engelmann spruce, subalpine fir habitat type is the most common, and occurs throughout central Idaho (Idaho Parks and Recreation 1989). The western red cedar-western hemlock type is more frequent in the northern portions of the area, and the ponderosa pine type exists intermittently throughout the PAA.

Vegetation varies by terrain, soils, aspect, elevation, and other factors. Below 4,000 feet, open slopes with brome, bluebunch wheatgrass, and Idaho fescue are common. Near 4,000 feet, grass types begin to give way to open ponderosa pine types. Subalpine fir and several types of lodgepole pine begin to appear at 5,000 feet to 6,000 feet. Near-alpine habitat is found in the highest elevational areas.

## **Wildlife**

Central Idaho and western Montana contain a wide variety of habitats and wildlife species. Approximately 400 species of mammals, birds, amphibians, and reptiles inhabit the 40 game management units in the primary analysis area (Figure 3-5). Major big game and species in the primary analysis area include post harvest populations of approximately 92,908 elk, 114,456 mule deer, an average of 75,881 (range is 67,631-84,131) white-tailed deer, 1,610 bighorn sheep, 1,751 mountain goats, 1,700 moose, and an average of 13,460 (range is 7,980-18,940) black bears (Table 3-3). Mountain lions, coyotes, bobcats, lynx, fishers, martens, wolverines, and river otters are other carnivores present. Small numbers of grizzly bears and mountain caribou occur in the Idaho panhandle just north of the PAA. The Idaho Department of Fish and Game (IDFG) continues to receive infrequent reports (175 from 1900-1986) of grizzly bears in the State, however no reports have been confirmed in the PAA since 1932. Presently, wildlife management agencies, both state and federal, believe the BE does not support a grizzly bear population.

Since January 1995, in an effort to restore endangered wolf populations in the northern Rocky Mountains, USFWS has released 35 wolves from Canada into central Idaho. These wolves are now distributing themselves and have formed packs across the PAA. As of May 1995, the recovering wolf population in central Idaho numbers over 100 individuals.

Big game ungulates such as elk and deer winter in lower elevations along river bottoms of most major drainages in the PAA including the Clearwater, Lochsa, Selway, Salmon, Clark Fork, and Bitterroot drainages. During summer and fall these ungulates are distributed throughout the PAA; elk and mule deer at higher elevations, and white-tailed deer at lower and mid-elevations. Trophy ungulates such as bighorn sheep, mountain goats, and moose, are more localized in distribution and can be found throughout the PAA wherever favorable habitats are found.

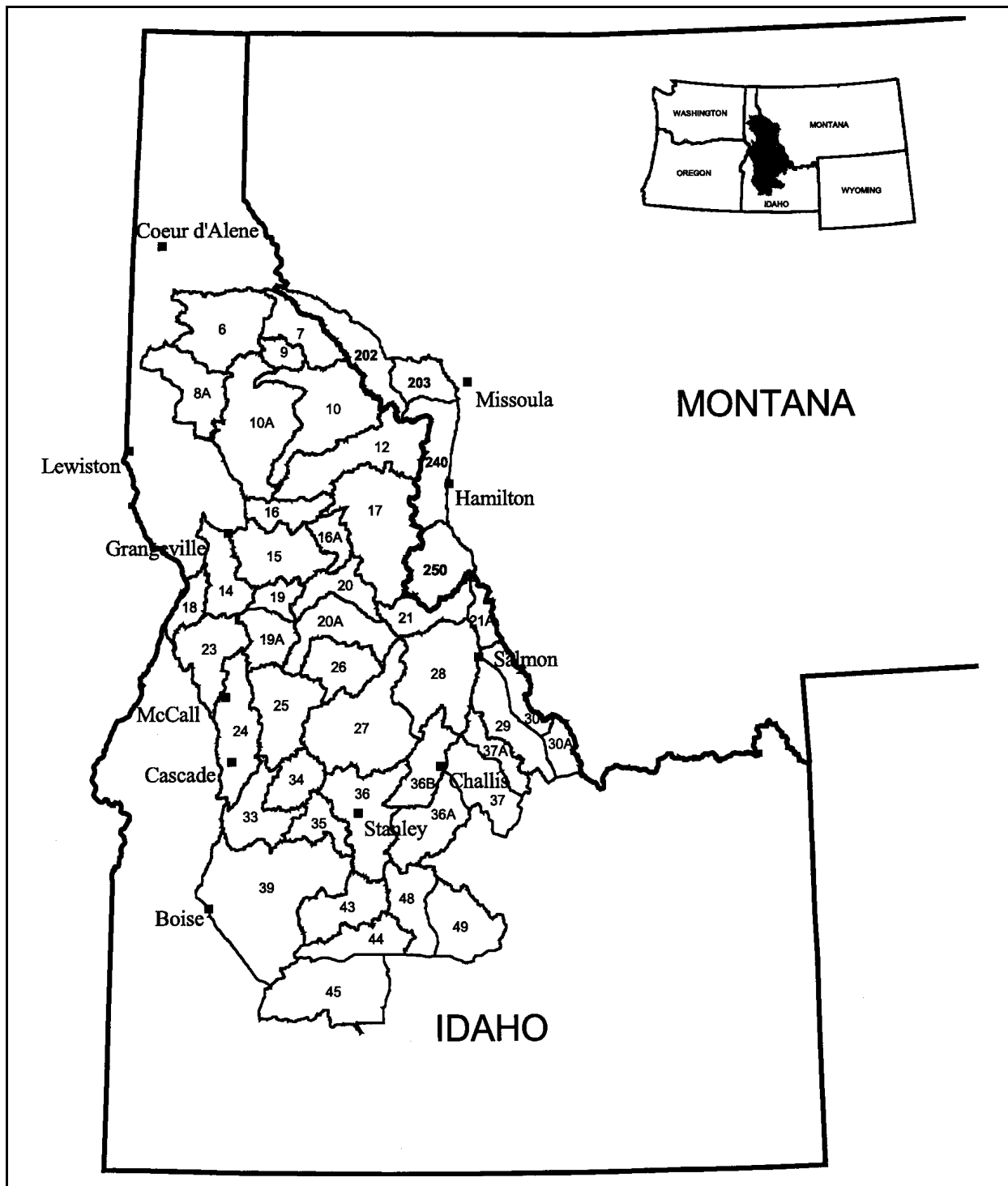


Figure 3-5. Central Idaho and western Montana big game management units analyzed to estimate ungulate and black bear numbers and harvest in the Bitterroot Grizzly Bear Primary Analysis Area. Not all units were used to calculate estimates for all species (see Table 3-3).

Hunting is a major influence on dynamics of ungulate populations. In 1997, Idaho and Montana (Montana data is 1995) hunters harvested about 28,023 ungulates, which represents an average of 10% of the pre-harvest population, in the 46 big game management units in the PAA (Table 3-3).

Table 3-3. Estimated population parameters and harvest numbers of elk, mule deer, white-tailed deer, bighorn sheep, mountain goats, moose, and black bear by in and adjacent to the Bitterroot Grizzly Bear Primary Analysis Area<sup>a</sup>.

| Species           | Population numbers (Postharvest) <sup>b</sup> |                    |                    |                     | Estimated harvest <sup>b</sup> |                    |                    |
|-------------------|---|--------------------|--------------------|---------------------|--------------------------------|--------------------|--------------------|
|                   | Male  | Female             | Young              | Total               | Male                           | Female             | Total              |
| Idaho             |   |                    |                    |                     |                                |                    |                    |
| Elk               | 13,592  | 57,962             | 16,493             | 88,047              | 5,325                          | 824                | 6,149              |
| Mule deer         | -   | -                  | -                  | 110,337             | 7,187                          | 2,018              | 9,205              |
| White-tailed deer | -   | -                  | -                  | 50,000-66,500       | 5,655                          | 2,324              | 7,979              |
| Bighorn sheep     | 302   | 864                | 161                | 1327                | 33                             | 0                  | 33                 |
| Mountain goats    | -   | 1,342              | 231                | 1,573               | 15                             | 12                 | 27                 |
| Moose             | -   | -                  | -                  | 1,700               | 180                            | 2                  | 182                |
| Black bear        | -   | -                  | -                  | 7,500-17,500        | 574 <sup>c</sup>               | 309                | 883                |
| Montana           |   |                    |                    |                     |                                |                    |                    |
| Elk               | 469 <sup>c</sup>                              | 3,353 <sup>c</sup> | 1,039 <sup>c</sup> | 4,861 <sup>c</sup>  | 463 <sup>c</sup>               | 471 <sup>c</sup>   | 934 <sup>c</sup>   |
| Mule deer         | -   | -                  | -                  | 4,119 <sup>c</sup>  | 540 <sup>c</sup>               | 119 <sup>c</sup>   | 659 <sup>c</sup>   |
| White-tailed deer | -   | -                  | -                  | 17,631 <sup>c</sup> | 1,549 <sup>c</sup>             | 1,272 <sup>c</sup> | 2,821 <sup>c</sup> |
| Bighorn sheep     | -   | -                  | -                  | 280                 | 2                              | 7                  | 9                  |
| Mountain goats    | -   | -                  | -                  | 178                 | 10                             | 2                  | 12                 |
| Moose             | -   | -                  | -                  | -                   | -                              | -                  | 13                 |
| Black bear        | -   | -                  | -                  | 480-1440            | 41                             | 21                 | 62                 |

<sup>a</sup> Big game population and harvest estimates are calculated from data available for Idaho big game units (6-49) and Montana hunting districts (202, 203, 240, & 250) in and adjacent to the Bitterroot Grizzly Bear Primary Analysis Area. For Idaho and Montana estimates, information for all species was not available for all units. Data availability depended on the geographic distribution or occurrence of each species within the primary analysis area, as well as hunting effort expended within each unit for a particular species. Estimates for a particular species reflects those units in which the species occurs and for which population and harvest information is available. All data from 1997 except as noted in "c" below.

<sup>b</sup> Population and harvest estimates are derived from many Idaho Department of Fish and Game (Boise, ID) and Montana Department of Fish, Wildlife, and Parks (Helena, MT) data. Specific sources are available in the planning record for this document available from U.S. Fish and Wildlife Service, Missoula, MT.

<sup>c</sup> Data for Montana population and harvest estimates for elk, mule and white-tailed deer are 1995 data. Current data are not available.

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#### ***Grizzly Bear Population Status***

Although little quantitative information exists, there are numerous historical accounts and more recent field surveys to provide an accurate history of the population status of grizzly bears in the BE. Historical evidence is provided by accounts of early explorers and memories of longtime area residents. Information regarding current population status of grizzly bears consists of four surveys conducted between 1984 and 1991 by the IDFG.

*Historical Status.* Grizzly bears are thought to have been common in the Clearwater drainage and the Selway-Bitterroot Mountains up to the turn of the century. Lewis and Clark were the first to document the presence of grizzly bears in the Clearwater drainage in 1806 and described frequent encounters. The Lewis and Clark expedition recorded killing at least 7 grizzly bears, including a female with cubs, and encountering several more while traveling up the Clearwater drainage on their way over Lolo trail (Thwaites 1959). Based on their account, the grizzly bear was more common than the black bear along the Clearwater River during their travels. Wright (1909, as cited by Melquist 1985) also reported that grizzly bears were common in the Clearwater and the Selway-Bitterroot Mountains in the late 1800's recounting numerous grizzlies taken on hunting expeditions. Moore (1984, 1996) researched the history of the grizzly bear in the Selway-Bitterroot Mountains and concluded that based on "conservative estimates", trappers near the turn of the century harvested 25 to 40 grizzly bears annually.

Around the turn of the century there is evidence that grizzly bear populations declined from excessive killing. Hunting, trapping, predator control programs, and possibly the decline of anadromous fish stocks lead to the virtual extirpation of the grizzly bear in the BE by the 1950's (Moore 1984, 1996, Melquist 1985). Merriam (1922) indicated that grizzly bears were still "fairly plentiful" in extreme northern Idaho but restricted to the Bitterroot, Clearwater, Lolo, and Salmon River Mountains in the Bitterroot Range in the early 1920's. Moore (1984, 1996) recounted personal encounters with grizzly bears during 1930 and 1931. Space (1979) and Moore (1984, 1996) reported the last known grizzly bear in the North Fork of the Clearwater River was killed in 1926, and that grizzly bears remained in the upper Lochsa drainage until about 1946. Moore (1984, 1996) saw several grizzly bear hides hanging in sheep herder camps in 1932. These were the last documented grizzly bears killed in the Bitterroot Range.

*Current Status.* Current evidence demonstrates that the BE no longer supports any grizzly bears, and thus does not support a grizzly bear population. Although the IDFG and the USFWS continue to receive sporadic reports of grizzly bears, none have been confirmed. In an effort to create a definition of a population for use in determining the feasibility of experimental population status for the Bitterroot Ecosystem, the USFWS solicited input from 54 scientists familiar with bear populations. Thirty-seven scientists responded and as a result of this Delphi analysis, the USFWS adopted a definition (Appendix 25). The definition of a grizzly bear population, as used to define a minimal existing grizzly bear population in the Bitterroot, follows: "A grizzly bear population is defined by verified evidence within the previous six years, consisting of photos within the area,

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verified tracks and/or sightings by reputable scientists or agency personnel, of at least two different female grizzly

bears with young or one female seen with different litters in two different years in an area geographically distinct from other grizzly bear populations. Verifiable evidence of females with young, to be geographically distinct, would have to occur greater than 10 miles (U.S. Fish and Wildlife Service 1993, page 171) from the nearest non-experimental grizzly bear population recovery zone boundary." Research data from the Cabinet-Yaak Ecosystem indicates the average home range size of an adult female grizzly bear when converted to a circle, has a radius of 10 miles (Kasworm and Servheen 1995).

The listing of the grizzly bear as a threatened species under the Endangered Species Act in 1975 and the subsequent inclusion of the BE as a potential recovery area in the Grizzly Bear Recovery Plan, has spurred interest in determining the population status of the bear. Melquist (1985) conducted a preliminary survey to determine status of the grizzly bear in the Clearwater National Forest. The survey consisted of ground and aerial searches, soliciting new grizzly bear observation reports, and compiling and evaluating 88 reports of grizzly bears recorded from 1900-1984. The survey failed to provide conclusive evidence of grizzly bears presence in the Clearwater National Forest. No sign of grizzly bears were found during aerial or ground searches and no observation reports received during the survey could be verified. In reviewing the 88 records of grizzly bear observations, Melquist reported two confirmed grizzly bear reports; one in 1909 in the Grangemont area and one in 1956 along Colt Creek in the White Sands River drainage near Powell. Subsequent verification efforts have shown that the 1956 report was not of a grizzly bear and that the last confirmed grizzly bears killed in the Bitterroot Mountains were those previously reported by Moore (1984, 1996) in 1932.

Groves (1987) continued Melquist's (1985) original work by compiling and reviewing a total of 175 historical grizzly bear reports for central and northern Idaho up through 1986. Groves compiled 77 reports of grizzly bears from within the "Bitterroot Grizzly Bear Recovery Area" including all National Forests except the Sawtooth and the Bitterroot National Forests. The majority (62) of reports were received for the Clearwater National Forest. Grove's efforts could not document additional evidence for confirmed grizzly bear reports.

In addition to compilation and evaluation of grizzly bear observation reports, Servheen et al. (1990) and Kunkel et al. (1991) conducted two consecutive summer field seasons (May - September) surveying for grizzly bears in the upper tributaries to the North Fork Clearwater drainage using remote cameras. During a total of 480 camera days, 559 photographs of wildlife were taken. No photographs of grizzly bears were taken during either field season. Although both authors cautioned that their efforts did not confirm the absence of bears in the BE because of the small area surveyed and low camera density (1/110 mi<sup>2</sup>) used, Kunkel (1991) concluded that the results of the two year effort indicated that if grizzly bears occurred in the North Fork Clearwater drainage, they existed in extremely low numbers. The USFWS has reviewed this data and concluded no grizzly bears inhabit the area.

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A letter clarifying interpretation of the four studies results, written by Dr. Wayne Melquist, State Endangered Wildlife Coordinator, Idaho Department of Fish and Game is included as Appendix 23. Melquist indicates the results reported in Melquist (1985), Groves (1987), Servheen et al. (1990) and Kunkel et al. (1991) do not conclusively prove grizzly bears do not exist in the Bitterroots, "however, for all practical purposes, they provide pretty good evidence that grizzlies have probably been absent from the area for at least the past 50 years."

#### ***Grizzly Bear Habitat Suitability***

The Grizzly Bear Recovery Plan (USFWS 1993) identified the need to evaluate the BE to determine its suitability as a grizzly bear recovery area. Three past studies have been undertaken to evaluate portions of the BE for grizzly bears (Scaggs 1979, Butterfield and Almack 1985, Davis and Butterfield 1991). All three of these studies have concluded that the BE contains suitable habitat essential to the maintenance of a grizzly bear population.

*Habitat Studies.* Butterfield and Almack (1985), and Davis and Butterfield (1991) evaluated suitability of habitats in the BE based on the essential grizzly bear habitat criteria of Craighead et al. (1982): space, isolation, sanitation, food, denning, vegetation types, and safety. Butterfield and Almack's (1985) study concluded the BE rated as an "ecologically superior area for grizzly bear recovery" and "the BE more than satisfies these habitat criteria". Davis and Butterfield (1991) conducted the most comprehensive study of grizzly bear habitat in the BE. Their analysis focused on a large portion of the BE they called the Bitterroot Grizzly Bear Evaluation Area (BEA) (Figure 3-6). The BEA encompassed 5,500 square miles centered around the Frank Church-River of No Return Wilderness north of the Salmon River, the Selway-Bitterroot Wilderness, and Roadless areas north of the Selway-Bitterroot Wilderness mostly in the North Fork Clearwater drainage to the crest of the Mallard Larkins Mountains. These authors concluded: "The BEA appears to meet many of the habitat criteria defined by Craighead et al. (1982) for grizzly bear habitat. The biological factors related to space, isolation, denning, vegetation and food appear adequate for grizzly bear recovery. Sanitation problems are minor and should be easily rectified with education and regulatory programs. The major obstacles to successful grizzly bear recovery in the BEA are related to potential human-caused mortality. Those mortality sources are primarily associated with hunting, poaching, and conflicts associated with U.S. Highway 12. Successful grizzly bear recovery in the BEA will depend on addressing these potential mortality sources through education, enforcement, and regulatory changes" (Appendix 3).

*Vegetation Types and Foods.* Concerns regarding the absence of anadromous fish stocks and the decline of whitebark pine, both important grizzly bear foods, and the potential effects on habitat suitability in the BE have been raised. Anadromous fish stocks, particularly chinook salmon, are thought to have provided an important food source, during adult spawning migrations at migration impediments and through spawner carcasses for grizzly bear populations in the BE (Hilderbrand et al. 1996, Brostrom 1996). Current runs of anadromous fish would no longer provide a readily abundant food source and would be supplemental at best. Brostrom (1996) indicated that although salmon are no longer widely available in the BE, other fish species such as cutthroat trout and kokanee salmon may provide supplemental food for grizzly bears (Appendix 3).



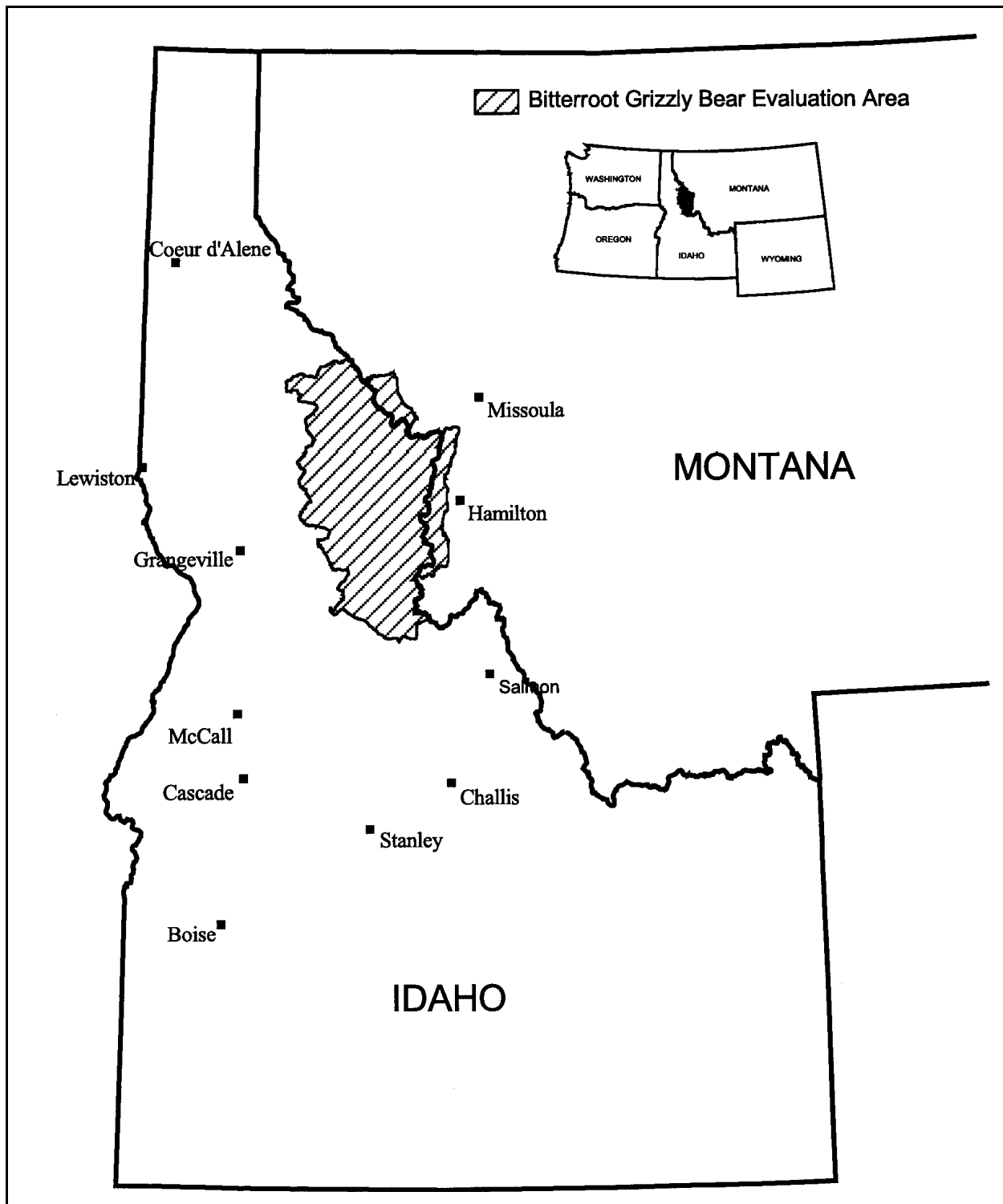


Figure 3-6. The Bitterroot Grizzly Bear Evaluation Area as described by Davis and Butterfield (1991).

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The importance of maintaining whitebark pine (*Pinus albicaulis*) as a food source for grizzly bears in the BE was discussed by Keane and Arno (1996). Historically, whitebark pine was a major species on 12-15% of the forest landscape. Whitebark pine populations were reduced by a mountain pine beetle infestation between 1909 and 1940. Also, white pine blister rust which was introduced to the western U. S. around 1920, has killed most of the mature whitebark pine in the northern and western portions of the Selway-Bitterroot Wilderness. Current levels have been estimated at 20-40% of historic levels (Keane and Arno 1996). Davis and Butterfield (1991) found whitebark pine consistently present in the non-riparian subalpine habitats and suggested that whitebark pine may still be an important fall food source for grizzly bears in the BEA. Despite the changes in habitat quality associated with reduction of whitebark pine and salmon, Butterfield and Almack (1985), and Davis and Butterfield (1991) identified a wide variety of vegetation types comparable to occupied habitat in other grizzly bear ecosystems, well distributed throughout the BEA. These authors concluded these habitats would support adequate sources of known grizzly bear foods including elk and deer, small mammals, herbaceous vegetation and tubers, and fruits and nuts. These studies demonstrated that over 60% of known herbaceous, and nearly 80% of known fruit and nut food items consumed by grizzly bears occurred in the BEA.

*Technical Review and Habitat Management.* In 1991, a Technical Review Team (Servheen et al. 1991) comprised of grizzly bear biologists and habitat specialists reviewed Davis and Butterfield's 1991 study along with other pertinent information and concluded the BEA contained adequate habitat to sustain a grizzly bear population of 200-400 animals.

In 1995, the USFWS issued interim direction for the management of suitable but unoccupied grizzly bear habitat in the BE, to be followed until a final grizzly bear recovery EIS is completed. Interim direction urged compliance of big game standards as outlined in USFS Forest Plans. Big game standards and guidelines for habitats overlapping the BE and contained within the Clearwater and Nez Perce National Forests were reviewed and deemed sufficient to protect potential grizzly bear habitat (Appendix 10).

A primary consideration in delineation of the BEA was to include USFS management areas with minimal road densities that provide quality grizzly bear habitat (Appendix 10, Figure 6-3). On the Clearwater National Forest, 631,700 acres within the BEA are allocated to wilderness, managed for natural resource values other than timber (with timber management as a secondary consideration), or removed from the timber base. A smaller proportion, about 120,000 acres, is allocated for optimizing timber production. The open road densities for the combined Clearwater and Nez Perce portions of the BEA are 0.43 mi/mi<sup>2</sup> in roaded/developed areas and 0.14 mi/mi<sup>2</sup> in unroaded/essentially undeveloped areas. The total road densities (open and restricted roads) for the same area are 0.60 mi/mi<sup>2</sup> in roaded/developed and 0.20 mi/mi<sup>2</sup> in unroaded/essentially undeveloped areas (Appendix 10). Within the Nez Perce Forest portion of the BEA, there are approximately 60 mi<sup>2</sup> (38,400 acres) that have a total road density exceeding 2 mi/mi<sup>2</sup>. The Clearwater Forest portion of the BEA has approximately 12 mi<sup>2</sup> (7,500 acres) where the total road density exceeds 2 mi/mi<sup>2</sup>.

The PAA is much larger than the BEA and has higher road densities. The open road densities within the entire PAA (0.44 mi/mi<sup>2</sup>), and within the non-Wilderness portion of the PAA (0.58 mi/mi<sup>2</sup>) are relatively low. The total road densities (which includes open and restricted system roads) within the PAA (1.00 mi/mi<sup>2</sup>), and within the non-Wilderness portion of the PAA (1.32 mi/mi<sup>2</sup>), are somewhat higher. Similarly, the open trail densities within the entire PAA (0.29 mi/mi<sup>2</sup>), and within the non-Wilderness portion of the PAA (0.38 mi/mi<sup>2</sup>) are relatively low. The total trail densities (which includes open trails and trails closed to motorized use) within the PAA (0.57 mi/mi<sup>2</sup>), and within the non-Wilderness portion of the PAA (0.75 mi/mi<sup>2</sup>) are somewhat higher.

***Current Research on Grizzly Bear Habitat Suitability in the Bitterroot Ecosystem.*** Public comment received on the Draft Environmental Impact Statement for Grizzly Bear Recovery in the Bitterroot Ecosystem indicated substantial concern about the amount and quality of habitat included in the Bitterroot area and the contribution of a restored grizzly bear population in the Bitterroot to the recovery and continued existence of grizzly bears south of Canada. Some commenters indicated they thought the designated recovery area was too small and did not provide sufficient habitat for the needs of a recovered population of bears. Other comments questioned the number of bears that could be supported by habitat within the wilderness and multiple use lands identified in the alternatives.

Four reports apply the best available scientific approaches to answer these questions, and are presented in Appendix 21. Together, these reports present significant new information on the capability of the Bitterroot Ecosystem to support grizzly bears, the distribution and abundance of the foods grizzly bears would use in this area, and the level of improvement that would occur in grizzly survival south of Canada if grizzly bears were restored in the Bitterroot Ecosystem.

***Habitat Capability and Estimation of Carrying Capacity.*** The first report, “Relating Populations to Habitats using Resource Selection Functions” (Appendix 21A), details a methodology to relate habitat to population size utilizing grizzly bears as an example. This methodology was specifically developed for this Bitterroot project and it has subsequently been accepted for publication in a peer reviewed scientific journal. This new method to relate habitat quality to how many animals can be expected to live in that habitat, was the basis for the estimate of the carrying capacity of the Bitterroot Ecosystem for grizzly bears.

The second report, “The Application of Resource Selection Function Analysis to Estimate the Number of Grizzly Bears that Could be Supported by Habitats in the Bitterroot Ecosystem” (Appendix 21B), applies the methodology developed in the first report (Appendix 21A) to the Frank Church-River of No Return and Selway-Bitterroot Wilderness areas, and non-wilderness public lands to the north. The result is an estimate of the number of grizzly bears that can be expected to be supported by the habitat in these areas. The report estimates that at full carrying capacity, between 234-247 grizzly bears could be expected to live in the Selway-Bitterroot and the Frank Church-River of No Return Wilderness areas, and an additional 74 grizzly bears could be expected to live in the public lands north of the Selway-Bitterroot Wilderness in the upper North Fork of the Clearwater

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River drainage in Idaho. It is estimated that it would take at least 80-100 years for the population to reach this full carrying capacity number if 25 bears were reintroduced.

The carrying capacity estimate of 308-321 bears for the Bitterroot Ecosystem is 10-15% higher than the tentative recovery goal estimate in the Draft Environmental Impact Statement (USFWS 1997). The USFWS expected the number of bears to be lower in the southern ½ of the Bitterroot Ecosystem because generally the habitats are dryer and less productive than northern portions of the ecosystem. Yet, portions of the Yellowstone Ecosystem are also relatively dry and support bears. Even though the forb and berry production in these dry habitats is relatively low, the southern ½ of the Bitterroot Ecosystem contains substantial stands of whitebark pine as well as populations of elk and deer that can provide food for grizzly bears. Certainly the remoteness of the area and the paucity of roads will help to ensure that a viable population of grizzly bears can persist in the Bitterroot Ecosystem of Idaho and Montana.

*Effect of the Bitterroot Reintroduction on the Persistence of Grizzly Bears in the Lower 48 States.* The third report, “Metapopulation Analysis for the Bitterroot Grizzly Bear Population” (Appendix 21C), describes the changes in the probability of existence of grizzly bears south of Canada with and without a restored Bitterroot population. One of the early tenets of conservation biology is that population viability is enhanced by maintaining multiple populations of a species (Soulé 1987). The report quantifies the reduced probability of extinction for grizzly bears in the Rocky Mountains of the United States by adding the proposed Bitterroot population. The probability of extinction for recovered population levels of the four existing populations (Yellowstone, Northern Continental Divide, Selkirk, and Cabinet-Yaak Ecosystems) and the proposed Bitterroot reintroduced population is very low, being smaller 3/1,000. These estimates should be viewed cautiously because there is great uncertainty in the estimates (Ludwig 1999). There is also a question of whether the probability of extinction is an appropriate measure to consider in a conservation context. In fact, resource managers already are committed to manage to achieve viable populations of grizzly bears larger than exist now (U.S. Fish and Wildlife Service 1993). The modeling results predict the addition of the Bitterroot population will reduce the probability of extinction by 88-99%, depending on different growth rate variances used in the model. In all cases examined in the report, there is a significant reduction in the probability of extinction for grizzly bears in the United States with a restored Bitterroot population. The addition of population areas (such as the proposed Bitterroot population) causes a geometric decline in extinction probability, and greatly improves the probability of existence and therefore the effectiveness of conservation for the grizzly bear.

*Important Food Producing Habitats for Grizzly Bears.* The fourth report, “Synopsis of Portions of, and Excerpts from the Report, ‘Abundance and Spatial Distribution of Grizzly Plant-Food Groups in the Salmon-Selway Ecosystem: A Preliminary Analysis and Report’ (Hogg, Weaver, and Craighead et al. 1999)” (Appendix 21D), presents detailed habitat maps showing the distribution and abundance of major grizzly bear foods in the Bitterroot Ecosystem in east-central Idaho. The Craighead Wildlife-Wildlands Institute (CWWI) of Missoula, Montana initiated a vegetation-based inventory and analysis of grizzly bear habitat in the Bitterroot Ecosystem in the fall of 1995 partially

in response to the USFWS Notice of Intent and Scoping for a proposal to recover grizzly bears in the Bitterroots. Part of the goal was to determine spatial distribution and abundance of grizzly bear food plants habitat for the entire ecosystem. Existing habitat studies including Scaggs (1979), Butterfield and Almack (1985), and Davis and Butterfield (1991) evaluated only portions of the ecosystem and used different methods. The USFWS approached the CWWI about incorporating some of their results into the Final EIS, and worked with CWWI researchers to share information, and review preliminary analyses and results. The following discussion and tables contain information summarized from the CWWI report, and Appendix 21D is a synopsis of portions of their report pertinent to the FEIS.

Landsat Thematic Mapper satellite imagery and botanical survey have been used to develop all-purpose vegetation maps for the Salmon-Selway region of central Idaho (Hogg, Weaver, Craighead et al. 1999). These authors then used these maps and plant species lists from the botanical surveys to estimate the abundance and spatial distribution of food-plant groups important to bears. The USFWS used the text, Tables 6-22, 6-23 and 6-24, and Figures 6-15, 6-16 and 6-17 (see Chapter 6, Appendix 21) from that report to produce the following summary statistics and comments regarding important food producing habitats for grizzly bears. The two Landsat scenes used in the CWWI analysis are referred to here as the North and South Scenes (see Figure 6-15). The edge-match boundary between the two scenes lies just south of the Salmon River. The CWWI analyzed several areas within the Bitterroot Ecosystem, including the recovery zone boundaries for Alternatives 1, 2, and 4. Since the Alternative 4 recovery zone boundary roughly approximates the Final EIS Primary Analysis Area (PAA) boundary, the results from analysis of alternatives will be presented here to maintain consistency with other data presented for the PAA in Chapter 3. Summaries for Alternative 4 can also be substituted for the experimental area of Alternative 1 and 1A because the boundaries are similar. Alternative 4 and Alternative 4A have the same recovery zone boundaries.

Summary comments provided here focus on results from the CWWI report related to whitebark pine nuts and several berry producing shrubs because these species provide a major contribution to annual energy demands for bears (Interagency Grizzly Bear Committee 1987). Major berry producing species (referred to as “primary berry species” in the CWWI report) considered included species of huckleberry (*Vaccinium*), serviceberry, cherry, elderberry, buffaloberry, and mountain ash. Secondary berry species included other species producing berries eaten by grizzly bears (Hogg, Weaver, and Craighead et al. 1999).

Whitebark pine nuts are most abundant in the vegetation complex labeled mixed whitebark pine forest (Table 3-4, and Table 6-22). The estimated total area covered by this complex is 1180 square miles, with 222 square miles in the north scene and 959 square miles in the south scene. Estimated areas of mixed whitebark pine forest within the boundary of each alternative were: 401 square miles in Alternative 1, 101 square miles in Alternative 2, and 1106 square miles in Alternative 4. The authors of the CWWI report built predictive models for the areal coverage of white bark pine tree canopies (Hogg, Weaver, and Craighead et al. 1999). Total areas predicted by this model to be covered by whitebark pine canopies within each alternative were; 63 square miles in Alternative 1, 22 square miles in Alternative 2, and 171 square miles in Alternative 4 (Table 3-5).

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Huckleberry species (*Vaccinium sp.*) are expected to be the dominant berries consumed by grizzly bears in the Bitterroot Ecosystem, but other prominent berry producing species exist such as buffaloberry, serviceberry, mountain ash, and cherry. These major berry species had high coverages in the non-forest vegetation complex labeled mesic shrublands (Table 3-4, Table 6-22 and Figure 6-15) and in the understory of certain timber types (Table 6-23). The CWWI classifications of forested areas resulted in maps of both the forest cover type and the understory vegetation complex. The following summary is limited to comments regarding the estimated amount of forest land belonging to a given understory complex to those understory vegetation complexes expected to have the highest coverages of huckleberry species other than grouse whortleberry (i.e., understory vegetation codes 40 and 60 in Table 3-4). These two understory complexes will be referred to as timber/huckleberry vegetation types. Total area covered by mesic shrublands was predicted to be 1733 square miles, with 1005 square miles in the north scene and 728 square miles in the south scene. Area of mesic shrublands within the boundary of each alternative was predicted to be 235 square miles in Alternative 1, 587 square miles in Alternative 2, and 1147 square miles in Alternative 4. Total area covered by timber/huckleberry vegetation types was predicted to be 5568 square miles, with 2943 square miles in the north scene and 2624 square miles in the south scene. Area of timber/huckleberry vegetation types within the boundary of each alternative was predicted to be 1777 square miles in Alternative 1, 1305 square miles in Alternative 2, and 4480 square miles in Alternative 4. Major berry species occur in significant amounts in several other non-forest and forest-understory vegetation complexes, although coverage of huckleberry species (*Vaccinium sp.*) other than grouse whortleberry is probably lower. The preceding estimates of area covered by vegetation complexes supporting major berries are therefore likely conservative. Furthermore, these area totals emphasized vegetation complexes expected to support relatively high densities of huckleberry species other than grouse whortleberry. Grouse whortleberry can in some years produce a significant crop of berries, but typically is less productive than other species of huckleberry. Grouse whortleberry is often associated with habitats that are drier or cooler, which are more commonly represented in the southern portions of the BE particularly south of the Salmon River .

In addition to whitebark pine (above), the authors of the CWWI report built predictive models for the collective areal coverage of plant species assigned to two other grizzly bear food-plant groups: primary and secondary berries (Hogg, Weaver, and Craighead et al. 1999). Huckleberry, buffaloberry, serviceberry, mountain ash, and cherry were classified as primary berry species. Numerous other plant species such as kinnikinnick, currant, gooseberry, and raspberry also produce a berry crop that is available to bears. All other such berry producing species were classified as secondary berry species. Total coverage of primary berries within each alternative was predicted to be 724 square miles in Alternative 1, 718 square miles in Alternative 2, and 2059 square miles in Alternative 4. Total coverage of secondary berries within each alternative was predicted to be 193 square miles in Alternative 1, 268 square miles in Alternative 2, and 742 square miles in Alternative 4 (Table 3-5).

In summary, results of Hogg, Weaver, and Craighead et al. (1999) indicate bear foods in the form of primary and secondary berries are present in biologically significant amounts in both the northern and southern portions of the ecosystem, but generally decline in abundance moving from north to

south through the Bitterroot Ecosystem (Appendix 21, Figures 6-16 and 6-17). This north-south decline in abundance is likely most marked for species of huckleberry other than grouse whortleberry. However, coverage for this sub-group of primary berry species (excluding grouse whortleberry) was not separately estimated by Hogg, Weaver, and Craighead et al. (1999). Grouse whortleberry could potentially provide a significant seasonal food source in some years. Particularly significant berry distribution occurs north of the Selway-Bitterroot Wilderness area in the North Fork of the Clearwater River drainage and throughout much of the Lochsa and Selway River drainages (Appendix 21, Figures 6-16 and 6-17). Whitebark pine and associated nut crops tend to follow the opposite pattern with greater abundance and distribution south of the Salmon River and a general decline through the northern portions of the Bitterroot Ecosystem (Appendix 21, Figure 6-15).

Table 3-4. Area of specific grizzly bear food producing habitat in the Bitterroot Ecosystem of western Montana and central Idaho (summarized from data in Hogg, Weaver, and Craighead et al. 1999).

| Vegetation Complex                | North Scene<br>(Square Miles) | South Scene<br>(Square Miles) | Alternative 1<br>(Square Miles) | Alternative 2<br>(Square Miles) | Alternative 4<br>(Square Miles) |
|-----------------------------------|-------------------------------|-------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Mixed Whitebark Pine              | 222                           | 959                           | 401                             | 101                             | 1,106                           |
| Mesic shrublands                  | 1,005                         | 728                           | 235                             | 587                             | 1,147.                          |
| Timber / huckleberry <sup>a</sup> | 2,943                         | 2,624                         | 1,777                           | 1,305                           | 4,480                           |

<sup>a</sup> This category includes understory vegetation complex code 40 and 60 (Hogg, Weaver, and Craighead et al. 1999).

Table 3-5. Estimates of the collective areal coverage of plant species in the grizzly bear food groups (summarized from data in Hogg, Weaver, and Craighead et al. 1999). See Appendix 21D for information on methods and additional data.

| Grizzly Bear Food Group        | Alternative 1<br>(Square Miles) | Alternative 2<br>(Square Miles) | Alternative 4<br>(Square Miles) |
|--------------------------------|---------------------------------|---------------------------------|---------------------------------|
| Whitebark pine (nuts)          | 63                              | 22                              | 171                             |
| Primary berries <sup>a</sup>   | 724                             | 718                             | 2059                            |
| Secondary berries <sup>b</sup> | 193                             | 268                             | 742                             |

<sup>a</sup> This category includes several species of huckleberry, serviceberry, cherry, elderberry, buffaloberry, and mountain ash.

<sup>b</sup> This category includes all other species of berry producing shrubs not identified as primary berries.

**Grizzly Bear Source Populations**

The origin of grizzly bears that would be reintroduced to the BE would have to be from areas having similar habitats to those in the BE. Three sources of grizzly bears for the BE have been identified: southeast British Columbia, the Northern Continental Divide Ecosystem (NCDE) population in northwest Montana, and the Yellowstone Ecosystem (YE) population (see Figure 2-5). Each of these areas have habitats similar to those found in the BE. Habitats in southeast British Columbia and the NCDE are more similar to habitats in the northern half of the BE, north of the Salmon River. YE habitats are likely to be more similar to those in the central and southern part of the BE such as those in the Selway River drainage and south of the Salmon River. These habitat comparisons are general, however, and there is much variation in habitats within and between all areas.

*The NCDE and YE Source Populations.* The NCDE contains 9,600 mi<sup>2</sup> of occupied grizzly bear habitat. It includes Glacier National Park, parts of the Flathead and Blackfoot Indian Reservations, parts of five national forests (Flathead, Helena, Kootenai, Lewis and Clark, and Lolo), Bureau of Land Management lands, and a significant amount of State and private lands. Four wilderness areas (Bob Marshall, Mission Mountains, Great Bear, and Scapegoat) and one wilderness study area (Deep Creek North) are included. The NCDE is contiguous to Canadian grizzly bear populations and interchange of bears has been documented. The minimum grizzly bear population estimate for the NCDE was calculated from sightings of females with cubs during 1998 as specified in the Recovery Plan (USFWS 1993) to be approximately 325 bears.

Grizzly bears presently occupy over 9,500 mi<sup>2</sup> of mountainous terrain in and surrounding Yellowstone National Park. The YE includes Yellowstone National Park, Grand Teton National Park, John D. Rockefeller Memorial Parkway, significant contiguous portions of the Shoshone, Bridger-Teton, Targhee, Gallatin, Beaverhead, and Custer National Forests, Bureau of Land Management lands, and over 86 mi<sup>2</sup> of State and private lands in Montana, Wyoming, and Idaho. The minimum grizzly bear population estimate for the YE was calculated from sightings of females with cubs during 1998 as specified in the Recovery Plan (USFWS 1993) to be approximately 328 bears.

The reintroduction of grizzly bears into the BE would require capture and relocation of a minimum of 25 bears over a period of 5 years from the identified source populations. These relocated bears would be lost from these populations and this loss would be a man-caused loss equivalent to a mortality. Some of these removals could be compensatory to other mortalities. Losses of bears from populations through human-caused actions are regulated and limited to assure the health of these populations. Mortality limits are in effect in both the NCDE and YE (USFWS 1993). Current mortality data for these ecosystems are presented in Tables 3-6 and 3-7. These mortality limits are currently set based on a formula that allows no more than 4% human-caused mortality of the minimum population estimate based on a running 6-year average. Of this 4% limit, no more than 30% can be females.



## Grizzly Bear Source Populations

Table 3-6. Annual **Northern Continental Divide Ecosystem** grizzly bear population and known, human-caused mortality data based on 1993 Grizzly Bear Recovery Plan criteria. Data from known, human-caused mortalities, minimum unduplicated counts of females with cubs, and distribution of females with young.

| Year | Annual Unduplicated Females with Cubs | Known Annual Adult Female Mortality | Known Annual All Female Mortality | Known Annual Total Mortality | 4% Total Mortality Limit | 30% All Female Mortality Limit | Annual Total Mortality 6 Yr. Average | Annual Female Mortality 6 Yr. Average |
|------|---------------------------------------|-------------------------------------|-----------------------------------|------------------------------|--------------------------|--------------------------------|--------------------------------------|---------------------------------------|
| 1987 | 29                                    | 4                                   | 7                                 | 11                           |                          |                                |                                      |                                       |
| 1988 | 25                                    | 4                                   | 7                                 | 9                            |                          |                                |                                      |                                       |
| 1989 | 37                                    | 1                                   | 5                                 | 12                           |                          |                                |                                      |                                       |
| 1990 | 14                                    | 2                                   | 5                                 | 14                           |                          |                                |                                      |                                       |
| 1991 | 21                                    | 0                                   | 1                                 | 5                            |                          |                                |                                      |                                       |
| 1992 | 22                                    | 3                                   | 9                                 | 15                           | 12.2                     | 3.7                            | 11.0 (66/6)                          | 5.7 (34/6)                            |
| 1993 | 21                                    | 1                                   | 1                                 | 5                            | 14.1                     | 4.2                            | 10.0 (60/6)                          | 4.7 (28/6)                            |
| 1994 | 27                                    | 1                                   | 3                                 | 6                            | 15.2                     | 4.6                            | 9.5 (57/6)                           | 4.0 (24/6)                            |
| 1995 | 35                                    | 2                                   | 6                                 | 12                           | 18.5                     | 5.6                            | 9.6 (58/6)                           | 4.2 (25/6)                            |
| 1996 | 17                                    | 2                                   | 4                                 | 10                           | 17.3                     | 5.2                            | 8.8 (53/6)                           | 4.0 (24/6)                            |
| 1997 | 13                                    | 1                                   | 5                                 | 12                           | 14.6                     | 4.4                            | 10.0 (60/6)                          | 4.7 (28/6)                            |
| 1998 | 33                                    | 3                                   | 8                                 | 19                           | 13.9                     | 4.2                            | 10.7 (64/6)                          | 4.5 (27/6)                            |

Table 3-7. Annual **Yellowstone Ecosystem** grizzly bear population and known, human caused mortality data based on 1993 Grizzly Bear Recovery Plan criteria. Data from known, human-caused mortalities, minimum unduplicated counts of females with cubs, and distribution of females with young.

| Year | Annual Unduplicated Females with Cubs | Known Annual Adult Female Mortality | Known Annual All Female Mortality | Known Annual Total Mortality | 4% Total Mortality Limit <sup>a</sup> | 30% All Female Mortality Limit | Annual Total Mortality 6 Yr. Average | Annual Female Mortality 6 Yr. Average |
|------|---------------------------------------|-------------------------------------|-----------------------------------|------------------------------|---------------------------------------|--------------------------------|--------------------------------------|---------------------------------------|
| 1987 | 13                                    | 2                                   | 2                                 | 3                            |                                       |                                |                                      |                                       |
| 1988 | 19                                    | 0                                   | 3                                 | 5                            |                                       |                                |                                      |                                       |
| 1989 | 16                                    | 0                                   | 0                                 | 2                            |                                       |                                |                                      |                                       |
| 1990 | 25                                    | 4                                   | 6                                 | 9                            |                                       |                                |                                      |                                       |
| 1991 | 24                                    | 0                                   | 0                                 | 0                            |                                       |                                |                                      |                                       |
| 1992 | 25                                    | 0                                   | 1                                 | 4                            | 10.2                                  | 3.1                            | 3.8 (23/6)                           | 2.0 (12/6)                            |
| 1993 | 20                                    | 2                                   | 2                                 | 3                            | 9.8                                   | 2.9                            | 3.6 (23/6)                           | 2.0 (12/6)                            |
| 1994 | 20                                    | 4                                   | 4                                 | 11                           | 8.6                                   | 2.6                            | 4.8 (29/6)                           | 2.2 (13/6)                            |
| 1995 | 17                                    | 3                                   | 7                                 | 17                           | 7.0                                   | 2.1                            | 7.3 (44/6)                           | 3.3 (20/6)                            |
| 1996 | 33                                    | 3                                   | 4                                 | 9                            | 9.8                                   | 2.6                            | 7.3 (44/6)                           | 3.0 (18/6)                            |
| 1997 | 31                                    | 3                                   | 4                                 | 8                            | 10.5                                  | 3.2                            | 8.5 (52/6)                           | 3.7 (22/6)                            |
| 1998 | 35                                    | 1                                   | 1                                 | 1                            | 13.4                                  | 4.0                            | 8.2 (49/6)                           | 3.7 (22/6)                            |

<sup>a</sup> Calculated as 4% of the minimum population estimate for the most current year which is based on the minimum number of females with cubs seen over the past three years.

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For the YE, these data show for 1996 and 1997 the annual total human-caused mortality limit as measured on a running 6-year average was not exceeded, and the female mortality limit as measured on a running 6-year average was exceeded in both years. In 1998, both the total and female mortality limits were not exceeded for the YE. To exceed the Recovery Plan (USFWS 1993) parameters, these limits must be exceeded for two consecutive years. The YE annual total mortality limit was not exceeded in 1997 and 1998, and annual female mortality limit was exceeded in 1997 and not exceeded in 1998. For the NCDE, human-caused annual total and female grizzly bear mortality limits were not exceeded in 1996. In 1997 and 1998, the annual total mortality limit was not exceeded and the female mortality limit was exceeded. These data are updated each year and any removal of bears from either ecosystem would be predicated on achievement of the mortality limits.

*Southeast British Columbia.* Southeast British Columbia has similar habitats to those found in the northern Bitterroot Ecosystem. Southeast British Columbia is composed of two Grizzly Bear Zones as defined by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)(Banci 1991). These two zones are the "Cool Dry Mountains" consisting of the Rocky Mountain core north of Glacier Park and the Whitefish range in the U.S. and including both British Columbia and Alberta (Waterton Park) areas on both sides of the continental divide; and the "Cool Moist Mountains" which include most of the rest of the southeast portion of the province. Population estimates for grizzly bears in these zones are shown in Table 3-8.

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Table 3-8. Population size and status of grizzly bear populations in southeast British Columbia and adjacent areas of southwest Alberta (Banci 1991).

| Grizzly Bear Zone    | Area (sq mi) | Current potential population | Estimated current population | Population status <sup>a</sup> |
|----------------------|--------------|------------------------------|------------------------------|--------------------------------|
| Cool dry mountains   | 20,077       | 1,120                        | 930                          | not at risk                    |
| Cool moist mountains | 49,923       | 4,700                        | 2,540                        | vulnerable                     |

<sup>a</sup> Per COSEWIC as defined in Banci (1991).

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Southeast British Columbia is within the Kootenay management region as defined by the British Columbia Ministry of Environment, Lands, and Parks (Figure 3-7). A recent report by Simpson et al. (1995) analyzes the grizzly bear status and management approach for the Kootenay region. The grizzly bear population in the Kootenay Region is estimated at 2177 grizzly bears divided into 15 different grizzly bear management units (GBMUs). Average annual harvests in the Kootenay Region for the past 19 years (1976-1994) in the 15 GBMUs varies by unit and totals 55.7 bears/year for an average harvest rate of 2.56%/year. The management objective recommended in the Simpson et al. (1995) report is a 4% human-caused kill limit of male grizzly bears and a 2% female limit.

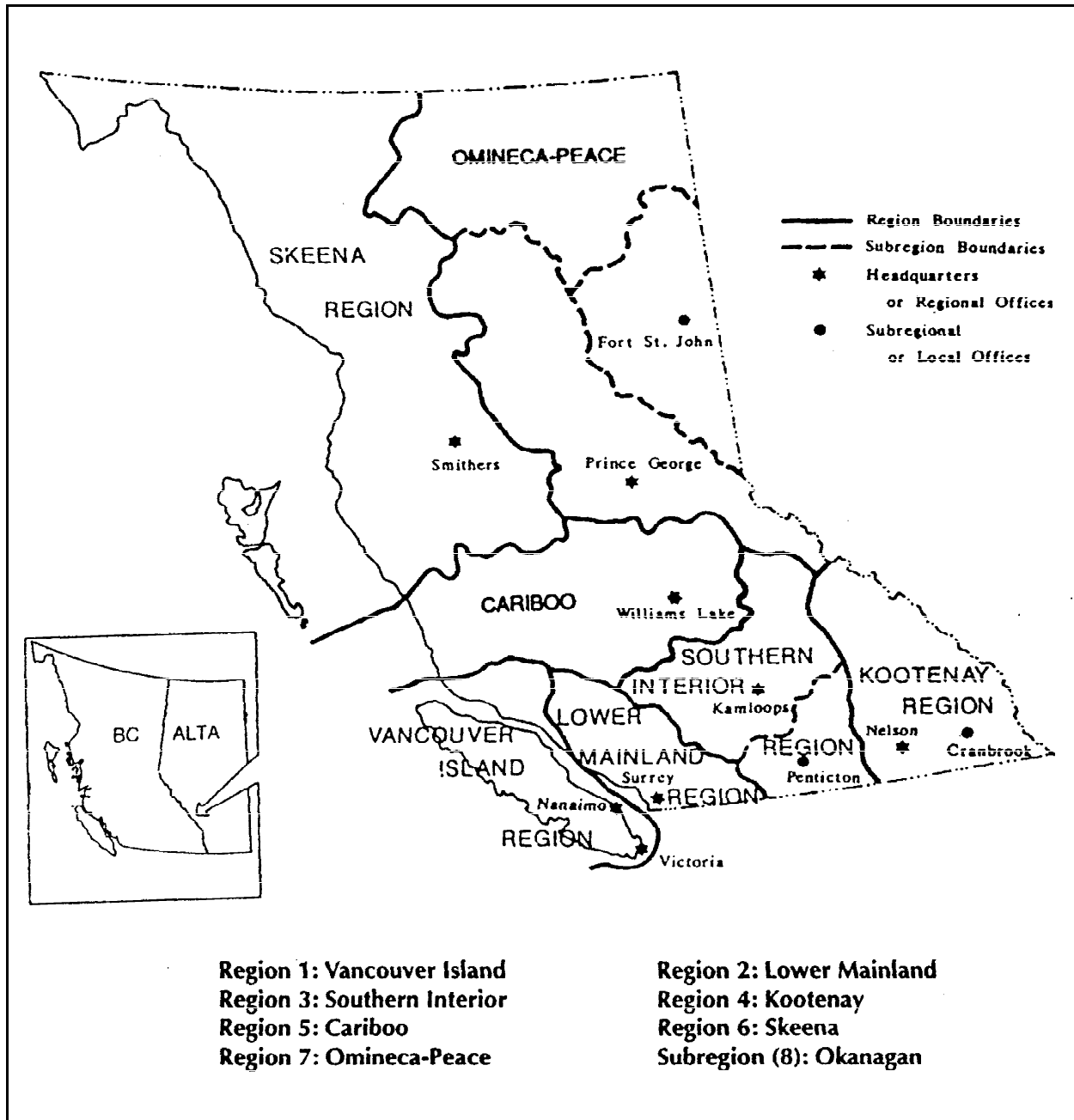


Figure 3-7. Administrative regions of the British Columbia Ministry of Environment, Lands, and Parks, including the Kootenay Region of southeast B.C. (B.C. Min. of Env., Lands, and Parks 1995).

### *Chapter 3 - Affected Environment*

In British Columbia, grizzly bear mortality is managed (B.C. Min. Environ., Lands, and Parks 1995) so that:

- a. the maximum harvest throughout the province will be no more than 4% of the total population, including kills from all sources;
- b. the maximum sex ratio of the harvest should be no greater than 1 female to 2 males (33% females);
- c. the unreported kill (natural mortality, accidental, illegal) is included in estimates of the total kill and standardized at 50% of the legal kill unless documentation indicates otherwise; and
- d. hunting seasons are not permitted in management units that support 25 or less grizzly bears unless such populations are contiguous with other populations.

## **BITTERROOT ECOSYSTEM OF CENTRAL IDAHO AND WESTERN MONTANA: LAND USES**

The 14 counties included in the PAA cover a total of 28,427,984 acres (44,419 mi<sup>2</sup>). This area is dominated by 18,489,989 acres (28,891 mi<sup>2</sup>) of contiguous USDA Forest Service lands in the center of the 14 counties. Within the core of the USFS lands lie the Frank Church-River of No Return, the Selway-Bitterroot, and Gospel Hump Wilderness Areas, covering 3,902,912 acres (6,098 mi<sup>2</sup>) in the heart of the PAA.

The Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act (NFMA) of 1976, specifies that land and resource management plans shall be developed for units of the National Forest System. Forest plans and accompanying environmental impact statements have been finalized for every national forest in the PAA. These plans provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner.

Forest Plans occur within a hierarchical framework of planning. The national assessment and program for forests and rangelands, as required by the Forest and Rangeland Renewable Resources Planning Act, sets broad strategic guidance for national forest lands. Forest Supervisors consider key elements of the program during forest plan implementation, monitoring, and evaluation. Regional Guides address regional issues and concerns and establish regional management standards and guidelines.

The Multiple Use-Sustained Yield Act of 1960 directed the management of national forests under the principles of multiple use, specifically endorsing wilderness as a proper use. Most of the Frank Church-River of No Return and the Selway-Bitterroot Wilderness areas were managed as primitive areas beginning in the 1930s. The Wilderness Act of 1964 created the National Wilderness Preservation System and gave statutory wilderness designation to the Selway-Bitterroot area and required that other primitive areas and adjacent lands be studied regarding their suitability for

wilderness designation. The Wilderness Act of 1964 states that wilderness areas shall be administered "for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character...."

The Endangered American Wilderness Act of 1978 created the 200,464 acre (313 mi<sup>2</sup>) Gospel Hump Wilderness Area. The Central Idaho Wilderness Act of 1980 established the 2,361,767 acre (3,690 mi<sup>2</sup>) River of No Return Wilderness and added approximately 105,600 acres (165 mi<sup>2</sup>) to the Selway-Bitterroot Wilderness (bringing the total Selway-Bitterroot Wilderness acreage to 1,340,681 acres; 2,095 mi<sup>2</sup>). The name "Frank Church" was legislatively added to the River of No Return Wilderness Area in 1984.

### **Timber Harvest**

Idaho and Montana national forests included in the PAA contain about 5,990,162 acres (9,360 mi<sup>2</sup>) of forested land classified as suitable for timber production (Table 3-9). According to current USFS Forest Plans, timber will be harvested on about 57,986 acres (91 mi<sup>2</sup>) annually in central Idaho during the first decade of implementation (Table 3-9). Under the existing USFS Forest Plans, expected annual volume of timber to be harvested in central Idaho and western Montana ranges from 695.9 million board feet during the first decade of Forest Plans to 1,204.9 million board feet during the fifth decade of Forest Plans (Table 3-10).

Most National Forests now believe that the trends in projected future harvest levels presented in their current 10-year Forest Plans are overestimated. Current timber harvest levels are also below those projected in the Forest Plans on some Forests. Table 3-11 lists the projected annual timber harvest (from the current Forest Plans), and the actual timber volume sold for the Forests (or portions of Forests) that occur within the PAA. The expected annual timber volume to be harvested on USFS lands within the PAA (from current Forest Plans) is estimated at 448.9 million board feet. The average timber volume sold within the PAA during the years 1992-1998 is approximately 191 million board feet (Table 3-11). The average annual USFS acreage harvested within the PAA during 1992-1998 is approximately 44,710 acres (70 mi<sup>2</sup>).

Timber harvests have a significant effect on the physical and biological environment. The extent of these impacts depends on specific methods of harvest, the area where the timber is harvested, and the rate at which it is harvested. Timber harvest activities may be restricted or modified because of standards designed to achieve specified fishery or wildlife objectives on the Forest.

Table 3-9. Land-use activities in central Idaho and western Montana national forests. Information from current USFS 10-year Forest Plans. Projections cover the period from the middle 1980s to the middle-late 1990s.

|                        | Number of acres   |                     | Proj. mean annual<br>harvest | Proj. mean annual<br>harvest (MMBF) <sup>a</sup> |
|------------------------|-------------------|---------------------|------------------------------|--|
| National Forest        | Livestock grazing | Suitable for timber |                              |  |
| Idaho                  |                   |                     |                              |  |
| Boise                  | 843,000           | 656,114             | 10,527                       | 85.0   |
| Clearwater             | 180,000           | 987,700             | 11,309                       | 173.0 <sup>b</sup>                               |
| Payette                | 757,848           | 821,021             | 6,869                        | 80.9   |
| Nez Perce              | 606,000           | 911,669             | 4,770                        | 108.0  |
| Salmon Challis         | 1,162,488         | 502,916             | 4,562                        | 24.1   |
| Sawtooth               | 910,674           | 99,211              | 1,392                        | 10.5   |
| Panhandle <sup>c</sup> | 7,561             | 409,200             | 4,939                        | 74.0   |
| Bitterroot             | 0                 | 0                   | 0                            | 0.0  |
| Montana                |                   |                     |                              |  |
| Bitterroot             | 160,900           | 363,331             | 3,118                        | 33.4   |
| Lolo                   | 187,500           | 1,239,000           | 10,500                       | 107.0  |
| Totals                 | 4,815,971         | 5,990,162           | 57,986                       | 695.9  |

<sup>a</sup> MMBF = Million board feet. Current annual harvest levels for most national forests are below projected levels.

<sup>b</sup> A lawsuit settlement resolving The Wilderness Society v. Robertson was signed by the USFS in 1993 and it establishes an interim annual maximum timber sale level of 80 MMBF for the Clearwater Forest until the Forest Plan revision is complete.

<sup>c</sup> St. Joe portion only.

Table 3-10. Projected annual timber harvest (million board feet) in central Idaho and western Montana national forests over the next 5 decades. Information from current USFS 10-year Forest Plans.<sup>a</sup>

| National Forests       | Timber harvest (million board feet) |          |          |          |          |
|------------------------|-------------------------------------|----------|----------|----------|----------|
|                        | Decade 1                            | Decade 2 | Decade 3 | Decade 4 | Decade 5 |
| Idaho                  |                                     |          |          |          |          |
| Boise                  | 85.0                                | 81.0     | 81.7     | 82.0     | 82.4     |
| Clearwater             | 173.0 <sup>b</sup>                  | 212.0    | 273.9    | 356.3    | 440.4    |
| Payette                | 80.9                                | 82.6     | 85.1     | 83.2     | 81.4     |
| Nez Perce              | 108.0                               | 138.0    | 180.0    | 210.0    | 210.0    |
| Salmon Challis         | 24.1                                | 24.1     | 30.7     | 31.7     | 32.7     |
| Sawtooth               | 10.5                                | 11.2     | 11.5     | 11.5     | 11.5     |
| Panhandle <sup>c</sup> | 74.0                                | 95.8     | 124.9    | 113.4    | 181.8    |
| Bitterroot             | 0                                   | 0        | 0        | 0        | 0        |
| Montana                |                                     |          |          |          |          |
| Bitterroot             | 33.4                                | 33.0     | 32.7     | 42.3     | 42.7     |
| Lolo                   | 107.0                               | 122.0    | 122.0    | 122.0    | 122.0    |
| Totals                 | 695.9                               | 799.7    | 942.5    | 1,052.4  | 1,204.9  |

<sup>a</sup> Most forests now feel that the trend in projected future harvest levels given in current 10 year plans are overestimated. For instance during the first decade, only the Boise national forest has met projected timber harvest levels. Actual harvest levels may continue to be lower than projected in the future.

<sup>b</sup> A lawsuit settlement resolving The Wilderness Society v. Robertson was signed by the USFS in 1993 and it establishes an interim annual maximum timber sale level of 80 MMBF for the Clearwater Forest until the Forest Plan revision is complete.

<sup>c</sup> Projected data not available for Avery Ranger District, Panhandle National Forest, decades 3 through 5.

Table 3-11. Projected annual timber harvest from current Forest Plans, and actual annual timber volume sold (million board feet) for USFS lands within the PAA in central Idaho and western Montana during 1992-1998 (USFS, unpubl. data 1999).<sup>a</sup>

| National Forests        | Projected annual<br>harvest for USFS<br>area within PAA | Actual timber volume sold (million board feet) |       |       |       |       |       |       | Average<br>timber sold<br>1992-1998 |
|-------------------------|---|--|-------|-------|-------|-------|-------|-------|-------------------------------------|
|                         |   | 1992   | 1993  | 1994  | 1995  | 1996  | 1997  | 1998  |                                     |
| Idaho                   |   |  |       |       |       |       |       |       |                                     |
| Boise                   | 51.0  | 55.3   | 158.3 | 52.7  | 158.6 | 44.9  | 33.9  | 22.0  | 75.1                                |
| Clearwater <sup>b</sup> | 135.0   | 47.2   | 14.5  | 24.0  | 11.5  | 42.7  | 35.8  | 30.2  | 29.4                                |
| Payette                 | 9.0   | 8.1  | 5.6   | 6.3   | 28.0  | 33.2  | 13.0  | 9.8   | 14.9                                |
| Nez Perce               | 100.0   | 17.2   | 29.0  | 10.3  | 4.4   | 20.6  | 34.4  | 22.4  | 19.8                                |
| Salmon/Challis          | 13.5  | 10.0   | 7.5   | 7.5   | 4.8   | 11.9  | 5.2   | 6.0   | 7.6                                 |
| Sawtooth                | 1.0   | 0.7  | 1.2   | 0.8   | 7.2   | 4.9   | 1.3   | 2.5   | 2.7                                 |
| Panhandle <sup>c</sup>  | 31.0  | 30.1   | 15.0  | 1.0   | 3.0   | 2.6   | 18.6  | 10.1  | 11.5                                |
| Bitterroot              | 0   | 0  | 0     | 0     | 0     | 0     | 0     | 0     | 0                                   |
| Montana                 |   |  |       |       |       |       |       |       |                                     |
| Bitterroot              | 33.4  | 7.0  | 8.7   | 4.7   | 8.1   | 6.1   | 10.0  | 12.0  | 8.1                                 |
| Lolo                    | 75.0  | 33.9   | 20.0  | 13.3  | 11.9  | 14.9  | 41.1  | 18.5  | 21.9                                |
| Totals                  | 448.9   | 209.5  | 259.8 | 120.6 | 232.8 | 181.8 | 193.3 | 133.5 | 191                                 |

<sup>a</sup> The timber volumes presented in this table are estimates of harvest volume planned (from current Forest Plans) and timber volume actually sold (from 1992-1998) within the Forest or portion of the Forest that occurs within the boundaries of the grizzly bear primary analysis area (Randy Gay, Frank Roth pers. comm. 1999).

<sup>b</sup> A lawsuit settlement resolving *TWS v. Robertson* was signed by the USFS in 1993 and it establishes an interim annual maximum timber sale level of 80 MMBF for the Clearwater Forest until the Forest Plan revision is complete.

<sup>c</sup> St. Joe Ranger District only.

National forest lands within the PAA contain about 26,164 miles of system roads (Table 3-12). Most roads have been developed as the direct result of timber harvest. Besides serving timber harvest, roads are also used for general forest administration, mineral exploration, fire protection, and recreation. Approximately 11,562 miles of these roads are open to unrestricted motorized travel year-round. The other 14,603 miles are subject to a variety of seasonal or yearly restrictions to motorized travel. Most restrictions are for the protection of wildlife habitat and water quality. Other restrictions are for the prevention of road and trail damage during spring runoff, protection of administrative sites and other public facilities from vandalism, protection of the public from unsafe conditions, and for reduction in cost of road maintenance.



Table 3-12. Miles of open and restricted system roads on national forest lands in the Bitterroot grizzly bear primary analysis area (USFS, unpubl. data 1995).

| National Forests | Miles of roads   |                        | Totals |
|------------------|------------------|------------------------|--------|
|                  | Open system road | Restricted system road |        |
| Idaho            |                  |                        |        |
| Boise            | 759              | 3,274                  | 4,033  |
| Clearwater       | 1,345            | 2,054                  | 3,399  |
| Payette          | 690              | 280                    | 970    |
| Nez Perce        | 1,141            | 2,492                  | 3,633  |
| Salmon Challis   | 1,823            | 821                    | 2,644  |
| Sawtooth         | 772              | 57                     | 829    |
| Panhandle        | 840              | 683                    | 1,522  |
| Bitterroot       | 78               | 3                      | 81     |
| Montana          |                  |                        |        |
| Bitterroot       | 1,716            | 1,407                  | 3,123  |
| Lolo             | 2,398            | 3,532                  | 5,930  |
| Totals           | 11,562           | 14,603                 | 26,164 |

## Livestock Grazing

Livestock grazing is permitted on approximately 4,815,971 acres (7,525 mi<sup>2</sup>) on national forests in central Idaho and western Montana (Table 3-9; Figure 3-8). Permits restrict type of livestock, stocking rate, and season of use. Outfitter and guide permits also allow seasonal grazing of horses. Temporary grazing of recreational horses is allowed on national forest lands throughout the central Idaho area. Restrictions on livestock grazing sometimes occur near riparian areas. Livestock are usually restricted from grazing for about 5 years in areas with newly replanted trees.

Approximately 36,216 adult cattle and 104,176 adult sheep are permitted on active national forest grazing allotments in the PAA each year (Table 3-13). Although the actual numbers of livestock using allotments during any one season varies from year to year, in general, actual numbers average about 90% of permitted numbers. It is assumed that 90% of the cows have calves (90 calves:100 cows), and sheep have an average of 1.2 lambs per ewe (120 lambs:100 ewes). The proportion of lambs to adult sheep was assumed higher than the proportion of calves to cows because sheep produce more sets of twins, offsetting adults who have not produced or have lost offspring. Total calves and lambs on allotments are estimated to be 32,595 calves and 125,012 lambs (Table 3-13). Calves and lambs are born in late winter or early spring, before adults are turned onto allotments on national forest lands.

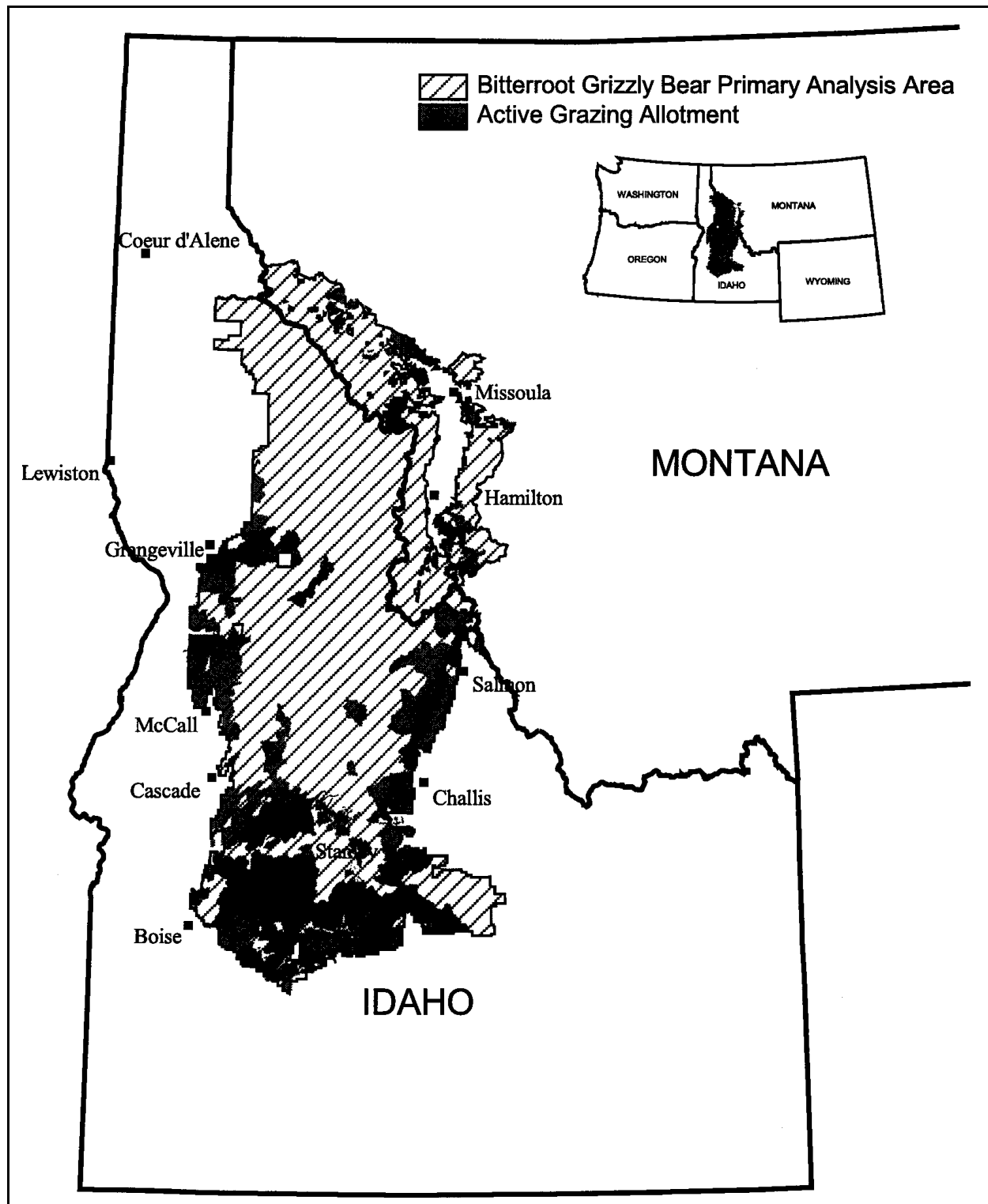


Figure 3-8. Active Idaho and Montana grazing allotments on federal lands in the Bitterroot Grizzly Bear Primary Analysis Area.

Table 3-13. Number of permitted cattle, sheep, and horses on active livestock allotments on national forest lands in the Bitterroot grizzly bear primary analysis Area (USFS, unpubl. data 1995)<sup>a</sup>.

| National forest | Adult cattle | Calves <sup>b</sup> | Adult sheep | Lambs <sup>c</sup> | Horses |
|-----------------|--------------|---------------------|-------------|--------------------|--------|
| Idaho           |              |                     |             |                    |        |
| Boise           | 4,925        | 4,433               | 30,568      | 36,682             | 575    |
| Clearwater      | 336          | 302                 | 0           | 0                  | 0      |
| Payette         | 1,330        | 1,197               | 12,117      | 14,540             | 200    |
| Nez Perce       | 3,161        | 2,845               | 2,304       | 2,765              | 0      |
| Salmon Challis  | 17,538       | 15,784              | 7,678       | 9,214              | 93     |
| Sawtooth        | 6,704        | 6,034               | 51,509      | 61,811             | 52     |
| Panhandle       | 0            | 0                   | 0           | 0                  | 10     |
| Bitterroot      | 0            | 0                   | 0           | 0                  | 25     |
| Montana         |              |                     |             |                    |        |
| Bitterroot      | 1,287        | 1,158               | 0           | 0                  | 0      |
| Lolo            | 935          | 842                 | 0           | 0                  | 9      |
| Totals          | 36,216       | 32,595              | 104,176     | 125,012            | 964    |

<sup>a</sup> Data represents numbers of animals permitted. Actual numbers of livestock on an allotment during any one season may vary substantially from year to year. Generally actual numbers average about 90% of permitted numbers.

<sup>b</sup> Assume 90 calves per 100 cows.

<sup>c</sup> Assume 120 lambs per 100 ewes.

Eighty-five percent of all cattle and sheep graze seasonally on the 3 southern Idaho national forests in the PAA, including the Boise, Sawtooth, and Salmon-Challis (Table 3-13). Cattle and sheep are present on most allotments in the PAA some time between May 1 to October 31. Livestock grazing on all allotments on the Sawtooth, Salmon-Challis, and Payette National Forests falls into this period. About 700 head of cattle are on the Boise National Forest as early as April, and over 1,000 head graze in November, and 350 head remain until December 15. On the Nez Perce National Forest, about 3,000 sheep graze one allotment from October 20 to January 15. Another 1,500 sheep begin grazing in the same allotment on April 1. About 500 cattle are present on Nez Perce National Forest allotments in November and 10 cattle are on 1 allotment throughout the year.

During winter, most livestock are maintained on 5,582,892 acres (8,723 mi<sup>2</sup>) of private land within the 14-county area surrounding the block of public land in the PAA. During the summer grazing season, a portion of the cattle and most of the sheep are moved to public land. In addition, several thousand sheep are moved in from out-of-state areas to be grazed on central Idaho national forests during the summer grazing season.

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A total of 391,527 cattle and 47,520 sheep are distributed across the 14 counties of the PAA (Table 3-14). In addition to cattle and sheep, a minimum of 4,221 hogs and 3,390 chickens are present in the 14 counties (Table 3-14).

Table 3-14. Number of cattle, sheep, hogs, and chickens in 14 central Idaho and western Montana counties in the Bitterroot Grizzly Bear Primary Analysis Area<sup>a</sup>.

| Counties   | No. cattle | No. sheep      | No. hogs | No. chickens |
|------------|------------|----------------|----------|--------------|
| Idaho      |            |                |          |              |
| Blaine     | 26,849     | 31,267         | 28       | 0            |
| Boise      | 5,351      | - <sup>b</sup> | -        | -            |
| Camas      | 7,445      | 0              | 0        | 0            |
| Clearwater | 3,963      | 92             | 30       | -            |
| Custer     | 42,004     | 4,208          | 65       | -            |
| Elmore     | 123,306    | -              | 173      | 491          |
| Idaho      | 41,393     | 3,520          | 3,045    | 945          |
| Lemhi      | 54,102     | 2,002          | 109      | -            |
| Shoshone   | 207        | -              | -        | -            |
| Valley     | 14,347     | 598            | 21       | -            |
| Montana    |            |                |          |              |
| Mineral    | 1,100      | 128            | 26       | -            |
| Missoula   | 13,103     | 1,023          | 55       | 438          |
| Ravalli    | 37,234     | 4,357          | 596      | 1,516        |
| Sanders    | 21,123     | 325            | 73       | -            |
| Total      | 391,527    | 47,520         | 4,221    | 3,390        |

<sup>a</sup> Sources: Montana and Idaho farm information from 1997 Montana and Idaho State Census of Agriculture data (USDA National Agricultural Statistics Service).

<sup>b</sup> Data not available.

### Recreation Use

Idaho and Montana provide a diversity of high quality outdoor recreation resources enjoyed by both residents and nonresidents. The 1986/87 Pacific Northwest Outdoor Recreation survey provided estimates of annual "activity occasions" by Idaho residents for a variety of recreational activities (Idaho Department of Parks and Recreation 1989). Nature study, hiking, walking, and camping activities were all projected to experience moderate to high growth to the year 2010. Hunting activities were projected to experience low growth to the year 2010 (Idaho Department of Parks and Recreation 1989).

In 1991, an estimated 396,000 residents and 311,000 nonresidents fished in Idaho and Montana. An estimated 316,000 residents and 100,000 nonresidents hunted in Idaho and Montana. In addition, 367,000 residents and 572,000 nonresidents participated in nonurban (nonresidential, nonconsumptive) activities in Idaho and Montana (U. S. Department of Commerce 1991, Table 3-15).

In 1991, residents spent an estimated 2,659,000 days fishing in Idaho and Montana and nonresidents spent 840,000 days fishing in these two states (Table 3-15). Residents of Idaho and Montana also spent 3,881,000 days hunting and nonresidents hunted 877,000 days in these two states. Residents spent 3,362,000 days participating in nonresidential activities in Idaho and Montana while nonresidents spent 4,394,000 days participating in nonresidential activities in these two states (U. S. Department of Commerce 1991, Table 3-15).

The primary analysis area contains about 14,789 miles of trails (Table 3-16). Trails provide for a variety of activities, including hiking, bicycling, motorcycling, horseback riding, nature study, backpacking, and four-wheeling. All of these activities are expected to have moderate to high growth to the year 2010 (Idaho Department of Parks and Recreation 1989). A 1994 "Idaho Department of Parks and Recreation User Survey" indicated increasing demand by user groups for multiple and single-use trails (Idaho Department of Parks and Recreation 1997). Trails exist on national forests both in wilderness and non-wilderness. Those in wilderness areas are restricted to nonmotorized, nonmechanized travel.

National forest lands in the PAA contain 493 developed recreation sites and provide over 13,268,395 Recreation Visitor Days (RVDs) annually (Table 3-17). Excluding the Sawtooth and Panhandle National Forests in Idaho (because RVD records for these Forests are not comparable to the other Forests), about 15% of the RVDs are associated with developed areas while about 85% of the RVDs are associated with dispersed (nondeveloped) and wilderness settings. RVDs are expected to continue to grow annually across the central Idaho primary analysis area. In 1992, 10,000 people floated the Main and Middle Forks of the Salmon River through central Idaho wilderness areas. A total of 9,171 people signed in at trail heads in the Frank Church-River of No Return Wilderness Area. USFS personnel met 21,230 visitors in the Frank Church-River of No Return Wilderness Area. Use in the Frank Church-River of No Return Wilderness Area has increased rapidly in recent years. RVDs are also expected to continue to grow annually within the Montana portions of the primary analysis area.

The outfitter and guide industries in Idaho and Montana offer a wide variety of outdoor recreation activities. Some of these activities include big game hunting, whitewater rafting, trophy fishing experiences, backcountry pack trips, and backpacking. There continues to be a steady increase in participation, and in Idaho there has been a notable increase in the boating segment of the industry (Idaho Department of Parks and Recreation 1997).

Table 3-15. Number of days and number of participants in fishing, hunting, and nonresidential nonconsumptive activities in Idaho and Montana in 1991<sup>a</sup>.

| Participants             | fishing   | hunting   | nonresidential<br>nonconsumptive | Totals     |
|--------------------------|-----------|-----------|----------------------------------|------------|
| Idaho                    |           |           |                                  |            |
| Resident participants    | 232,000   | 158,000   | 194,000                          | 584,000    |
| Nonresident participants | 133,000   | 35,000    | 188,000                          | 356,000    |
| Total participants       | 365,000   | 193,000   | 382,000                          | 940,000    |
| Resident days            | 2,495,000 | 1,941,000 | 1,722,000                        | 6,158,000  |
| Nonresident days         | 662,000   | 226,000   | 1,717,000                        | 2,605,000  |
| Total days               | 3,157,000 | 2,168,00  | 3,439,000                        | 8,764,000  |
| Montana                  |           |           |                                  |            |
| Resident participants    | 164,000   | 158,000   | 173,000                          | 495,000    |
| Nonresident participants | 178,000   | 65,000    | 384,000                          | 627,000    |
| Total participants       | 342,000   | 223,000   | 558,000                          | 1,123,000  |
| Resident days            | 1,872,000 | 1,940,000 | 1,640,000                        | 5,452,000  |
| Nonresident days         | 1,284,000 | 651,000   | 2,677,000                        | 4,612,000  |
| Total days               | 3,156,000 | 2,591,000 | 4,317,000                        | 10,064,000 |

<sup>a</sup> Information from: U.S. Department of Commerce, Bureau of Census. 1991. National survey of fishing, hunting, and wildlife associated recreation. U. S. Government Printing Office. Washington, D.C.

In the 46 big game management units covering the primary analysis area (Figure 3-5), 171,799 hunters spent 1,166,658 days in the field harvesting 55,606 elk and deer during general and controlled hunts during the 1994 season. One hundred twenty-five outfitters and guides operate in the 42 big game management units in the central Idaho portion of the primary analysis area. In 1991, 102 of these outfitters and guides provided big game tags to 4,614 nonresidents and 465 residents (Table 3-18). Most tag sales were for nonresident deer and elk hunters. Fifty-one hunting outfitters operate in the 4 big game management units in the western Montana portion of the primary analysis area (Units 240 and 250 = 45, Unit 202 = 6, Unit 203 = 0). The total number of outfitters that operate within the 46 big game management units comprising the PAA of Idaho and Montana is 176.

Table 3-16. Miles of recreational trails on national forest lands in the Bitterroot grizzly bear primary analysis area (USFS, unpubl. data 1995).

| National Forests | Miles of trails  |                              |                    |
|------------------|------------------|------------------------------|--------------------|
|                  | Open             | Closed to motorized vehicles | Total              |
| Idaho            |                  |                              |                    |
| Boise            | 846 <sup>a</sup> | 249                          | 1,095              |
| Clearwater       | 1,115            | 384                          | 1,539 <sup>b</sup> |
| Payette          | 613              | 822                          | 1,435              |
| Nez Perce        | 1,205            | 2,001                        | 3,206              |
| Salmon Challis   | 1,075            | 1,647                        | 2,422              |
| Sawtooth         | 706              | 850                          | 1,556              |
| Panhandle        | 513              | 83                           | 596                |
| Bitterroot       | 0                | 590 <sup>c</sup>             | 590                |
| Montana          |                  |                              |                    |
| Bitterroot       | 584              | 271                          | 855                |
| Lolo             | 890              | 605                          | 1,495              |
| Total            | 7,547            | 7,502                        | 14,789             |

<sup>a</sup> Includes 150 miles of cross-country ski trails and 400 miles of snowmobile trails.

<sup>b</sup> About 25% of trails are in wilderness.

<sup>c</sup> All trails are in wilderness area.

Table 3-17. Recreation Visitor Days (RVDs) and number of developed recreation sites on national forest lands in the Bitterroot grizzly bear primary analysis area (USFS, unpubl. data 1995).

| National Forests       | RVDs                   |           |            |            | Number of Developed Recreation Sites |
|------------------------|------------------------|-----------|------------|------------|--------------------------------------|
|                        | Developed              | Dispersed | Wilderness | Total      |                                      |
| Idaho                  |                        |           |            |            |                                      |
| Boise                  | 432,093                | 1,229,802 | 0          | 1,661,895  | 75                                   |
| Clearwater             | 243,100                | 1,503,500 | 35,400     | 1,782,000  | 26                                   |
| Payette                | 75,000                 | 465,000   | 122,000    | 662,000    | 21                                   |
| Nez Perce              | 115,000                | 451,100   | 241,000    | 807,000    | 64                                   |
| Salmon Challis         | 372,700                | 481,600   | 447,400    | 1,297,700  | 49                                   |
| Sawtooth               | 1,674,900 <sup>a</sup> | 13,200    | 90,100     | 1,778,200  | 160                                  |
| Panhandle <sup>b</sup> |                        |           |            | 215,300    | 17                                   |
| Bitterroot             | 50,200                 | 258,700   | 64,000     | 372,900    | 8                                    |
| Montana                |                        |           |            |            |                                      |
| Bitterroot             | 315,600                | 3,031,800 | 72,000     | 3,419,400  | 34                                   |
| Lolo                   | 138,000                | 1,131,000 | 3,000      | 1,272,000  | 39                                   |
| Totals <sup>c</sup>    | 1,741,693              | 8,552,502 | 984,800    | 13,268,395 | 493                                  |

<sup>a</sup> Includes Dispersed RVDs for the Ketchum District and Sawtooth National Recreation Area (records for Dispersed RVDs are not kept separate from Developed RVDs for these areas).

<sup>b</sup> Avery district only. Only Total RVDs available.

<sup>c</sup> Developed, Dispersed, and Wilderness RVD Totals do not include the Sawtooth and Panhandle Forest data.

Table 3-18. Number of big game tags provided by 102 outfitters and guides in 36 big game management units in the central Idaho portion of the Bitterroot Grizzly Bear Primary Analysis Area. Numbers from 1991 license year (IDFG, unpubl. data 1991).

| Species Tags     | Idaho Residents | Nonresidents  | Total Tags    |
|------------------|-----------------|---------------|---------------|
| Deer             | 198             | 1,763         | 1,961         |
| Elk <sup>a</sup> | 219 (210)       | 2,202 (2,032) | 2,421 (2,242) |
| Bear             | 46              | 637           | 683           |
| Mountain Lion    | 2               | 12            | 14            |
| Totals           | 465             | 4,614         | 5,079         |

<sup>a</sup> Parentheses indicate 1992-1996 average for elk tags.



## **Minerals Extraction**

The PAA contains 3 wilderness areas covering a contiguous area of 3,902,912 acres (6,098 mi<sup>2</sup>). These include the Frank Church-River of No Return (2,361,767 acres; 3,690 mi<sup>2</sup>), the Selway-Bitterroot (1,340,681 acres; 2,095 mi<sup>2</sup>), and the Gospel Hump (200,464 acres; 313 mi<sup>2</sup>) Wilderness Areas. Mining activities were allowed in wilderness areas to the same extent as in non-wilderness until January 1, 1984. At this time, minerals in wilderness areas (excluding valid existing mineral rights) were withdrawn from all forms of appropriations under existing mining laws and amendments. The Wilderness Act of 1964 gives private property owners the right of access and mining claim owners the right of egress and ingress.

The PAA includes about 16,686,596 acres (26,072 mi<sup>2</sup>) of contiguous national forest lands in central Idaho and western Montana (Figure 3-2). These include the Bitterroot, Boise, Challis, Clearwater, Nez Perce, Payette, Sawtooth, Salmon, and Panhandle National Forests in Idaho, and the Bitterroot and Lolo National Forests in western Montana. A few scattered parcels of private and state land are interspersed throughout this area, but the total acreage is minor. There are 12,783,684 acres of USFS lands within the PAA and outside of designated wilderness areas that are managed under the principles of multiple use (as directed by the Multiple Use-Sustained Yield Act of 1960), to include minerals extraction.

The minerals activity on USFS lands within the PAA is summarized in 3 categories (Jim Sheldon and Tom Buchta, pers. comm. 1996). “Active claims” are those that have been filed and fees paid, but have no activity to date. “Operations” are those claims that have approved operating plans, with activities that range from core drilling, backhoe holes, small pits, and suction dredging, to small scale mining with 1-2 pieces of equipment and 2 acres or less in size. “Abandoned mines” are either inactive, or have cleanup activity occurring that ranges from small mines to superfund sites.

The total number of active claims in the PAA on Region 1 Forests (Bitterroot, Idaho Panhandle, Clearwater, Lolo, and Nez Perce) is 3,445 claims over 51,850 acres. There is one large claim block not included in the above totals. These are lode claims (hard rock) for 90,000 acres on the Montana/Idaho border of the Clearwater and Lolo National Forests. The block of claims was filed in 1990 and are in the exploration stage now. With the addition of this claim block, the Region 1 total is 3,446 claims over 141,350 acres. The total number of active claims in the PAA on Region 4 Forests (Sawtooth, Boise, Challis, Salmon, and Payette) is approximately 18,697 unpatented claims over approximately 336,546 acres. Thus the total number of active claims for the USFS lands in the PAA is approximately 22,143 claims over 477,896 acres.

The total number of operations for the Region 1 Forests is approximately 394, including 152 notices of intent and 125 plans of operation administered. There are no large scale operations in Region 1. The largest are open pits or placer mines with a maximum of 25 acres of land disturbed in the pits and dumps. There is one operation permitted on the Bitterroot Forest for vermiculite, which, if developed could be 60-80 acres. The total number of operations in Region 4 is approximately 754, including 494 notices of intent and 260 plans of operation administered. There are 8 large scale

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operations within the PAA in USFS Region 4. Approximately 5,000 acres of public and private lands within the boundaries of National Forests are disturbed by these large mines that range from 150 to 2,500 acres each. The total number of operations on USFS lands in the PAA is approximately 1148.

The total number of abandoned mines in the PAA on Idaho Forests in Region 1 (Nez Perce, Clearwater, and Avery District of the Idaho Panhandle) is 1,485. The number of abandoned mines on Region 1 Forests in Montana is not known, but 17 have been identified as hazardous and targeted for cleanup activity. Idaho abandoned mines have not been assessed for hazard, but most are not hazardous (Jim Shelden, pers. comm.). In 1995, some remediation work was done on 7 Idaho mines. Region 4 Forests in the PAA have three large cleanup projects in progress on abandoned mines. These include the Stibnite mine (Payette Forest), Cinnabar mine, and Blackbird mine (Salmon Forest) which is a superfund cleanup site.

## **BITTERROOT ECOSYSTEM OF CENTRAL IDAHO AND WESTERN MONTANA: SOCIO-ECONOMICS AND CULTURAL PERSPECTIVE**

### **Population**

In 1996 the combined population of Idaho and Montana was 2.09 million people (Table 3-19). While the population in the region grew at a rate of about 2.3 percent in the 1970's, it was nearly constant in the 1980's. This region is sparsely populated. There was an average of 9.0 people per square mile in 1996; compared to over 75 people per square mile in the United States as a whole. About 12.3 percent of the population in the 2 states is age 65 or older. This component of the population is expected to grow dramatically relative to other age groups in the United States as a result of relatively low fertility rates and longer life expectancies (U.S. Dept. of Commerce 1984).

Idaho and Montana are rich in outdoor recreation opportunities; the region boasts national and international recognition for its National Parks, extensive wilderness areas, and high quality hunting, fishing, and wildlife viewing opportunities. Not surprisingly, residents of the region value outdoor recreation highly. In a 1993 study, the USFWS (1993) found that 79 percent of regional (Idaho and Montana) residents participated in outdoor recreation activities, compared to 69 percent of people nationwide. Residents of the region had higher rates of participation in fishing (67 percent, compared to 46 percent nationwide), viewing wildlife (83 percent, compared to 67 percent), and hunting (51 percent, compared to 19 percent).

The fourteen counties in the PAA had a combined population of 240,928 in 1996 (Table 3-19). Population growth of counties within the PAA has followed the same trend as the population in the region over the past two decades. The population of these 14 counties accounts for about 12 percent of the population of the 2 state region. About 12.2 percent of the people in the recovery area are aged 65 or older. These 14 counties are very sparsely populated with an average of 5.4 people per square mile (Table 3-19). This average is compared to an average of 9.0 people per square mile for the two state region. The sparse population in the PAA is in a large part due to two factors: the

ruggedness and inaccessibility of much of the land in the area, and the large percentage of public land in the area which is administered by federal or state agencies.

Table 3-19. Population trends in Idaho and Montana and the Bitterroot grizzly bear primary analysis area from 1970 to 1996.<sup>a</sup>

| Area              | Population |           |           |           | 1996<br>Density<br>(sq. mi.) | Acres<br>(millions) |
|-------------------|------------|-----------|-----------|-----------|------------------------------|---------------------|
|                   | 1970       | 1980      | 1990      | 1996      |                              |                     |
| Idaho and Montana | 1,415,000  | 1,738,000 | 1,812,000 | 2,065,000 | 9.0                          | 146.9               |
| 14-county area    | 165,000    | 208,000   | 209,000   | 240,928   | 5.4                          | 28.4                |

<sup>a</sup> Primary information source: 1998 data from Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

## Economy

Average per capita personal income for Idaho and Montana was \$19,481 in 1996 (Table 3-20). In real dollars it grew at a rate of about 1.6 percent per year during the 1970's and 1.1 percent per year during the 1980's. Between 1990 and 1996 real per capita personal income grew at a rate of 2.8 percent per year.

Total personal income in the region was \$40.5 billion in 1996. Personal income in central Idaho and western Montana stems from a variety of economic sectors (Table 3-20). Farm income and agricultural services accounted for only 3.2 percent of the total, declining from about 12 percent in the early 1970's. Livestock accounted for 54.5 percent of the value of farm products sold in the region in 1987 (U.S. Dept. of Commerce 1992). Local services (local transportation and utilities; retail trade; finance; insurance; real estate; and state, local, and federal civilian government) have consistently generated about 40 percent of total personal income over the past three decades. Other industry (forestry, fisheries, mining, construction, manufacturing, other transportation and freight, wholesale trade, and federal government military enterprises) accounted for about 23.5 percent in 1996, declining from 28.3 percent in the 1970's. The remaining 32 percent is income other than earnings. This category, which includes dividends, interest, rent, transfer payments (primarily from retirement programs and medical payments), and an adjustment to wealth from changes in the value of residential housing, has steadily increased in importance over the past two decades from about 20 percent in the early 1970's. This trend reflects the increasing relative importance of "footloose income" (Power, 1991) in the regional economy. This income follows people who choose where they want to live based on the perceived "quality of life" and may be positively correlated with such amenity values as the existence of healthy wildlife populations, lack of crime, clean air, etc. Because

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the age group to whom this income is primarily attached, 55 years of age and older, is expected to grow in relative importance in the population as a whole, this trend should continue.

Tourism is an important "industry" to both states in the region. Visitors from outside the region visit Montana and Idaho in large numbers, in all seasons, in order to see parks and wilderness areas, ski, float rivers, fish, hunt, and simply enjoy scenery. These visitors spend large amounts of money when they visit the region, and these expenditures, in turn, have a large impact on incomes and employment in the region. As an example, Duffield (1992) found that visitors to Yellowstone National Park who came from outside the three state region spent an average of \$840 in the region during their trips. Tourism has become a significant and growing industry for Idaho during the past 10 years, and this growth is expected to continue. Estimates made for 1987 and again for 1993 indicate about 60% of outdoor recreation participation and leisure travel in Idaho is attributable to out-of-state visitors to Idaho. The outfitting and guiding industry benefits from increased tourism, and although it is not the largest economic sector in Idaho and Montana, it plays a significant role in many rural communities and counties (Idaho Department of Parks and Recreation 1997).

Per Capita income in the fourteen-county area (Figure 3-4) of the PAA for 1996 was \$19,191 (Table 3-20). Total personal income was \$4.7 billion in 1996. This represents approximately 11.5 percent of the 2 state regional total personal income. In 1996 income from farming sources and agricultural services accounted for approximately 0.7 percent of the total personal income in this 14-county area (Table 3-21). This 1996 percentage has declined from about 3.8 percent in 1993 and 5.5 percent in 1970. Livestock accounted for about 72 percent of the value of farm products sold in these counties in 1987. This percentage is somewhat higher than the 54.5 percent livestock share for the 2 state region. This greater reliance on livestock in the farming sector is likely due to generally rough topography and high altitude of central Idaho which makes cropping impractical in much of this area. The source of personal income which showed growth in the period 1970-1990 was income other than earnings (which increased from 15.7 percent in 1970 to 33.5 percent in 1990). Other industry, in general, has become relatively less important as a component of personal income in the last two decades, falling from 40.3 percent in 1970 to 21.4 percent in 1996 of total personal income. Mining, manufacturing, and construction have all decreased as a percentage of total personal income during this time period.

Table 3-20. Per capita income trends for Idaho and Montana and the Bitterroot grizzly bear primary analysis area from 1970 - 1996.<sup>a</sup>

| Area              | Per capita income |           |           |           |
|-------------------|-------------------|-----------|-----------|-----------|
|                   | 1970              | 1980      | 1990      | 1996      |
| Idaho and Montana | 13,007.00         | 15,023.00 | 16,643.00 | 19,481.00 |
| 14-county area    | 12,459.00         | 14,794.00 | 16,476.00 | 19,191.00 |

<sup>a</sup> Primary information source: 1998 data from Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System. Dollar figures are adjusted to 1996 price levels.

Table 3-21. Major economic sectors as a percentage of total personal income for Idaho and Montana and the Bitterroot grizzly bear primary analysis area.<sup>a</sup>

| Area              | Percent of total personal income |      |      |      |
|-------------------|----------------------------------|------|------|------|
|                   | 1970                             | 1980 | 1990 | 1996 |
| Idaho and Montana |                                  |      |      |      |
| Farm              | 12.0                             | 3.7  | 6.0  | 3.2  |
| Local services    | 39.6                             | 39.8 | 39.0 | 41.4 |
| Other industry    | 28.3                             | 29.3 | 24.1 | 23.5 |
| Non-earnings      | 20.1                             | 27.2 | 30.9 | 31.9 |
| 14-county area    |                                  |      |      |      |
| Farm              | 5.5                              | 3.0  | 4.1  | 0.7  |
| Local services    | 38.6                             | 36.7 | 37.6 | 41.5 |
| Other industry    | 40.3                             | 35.5 | 25.3 | 21.4 |
| Non-earnings      | 15.7                             | 24.9 | 33.1 | 36.5 |

<sup>a</sup> Primary information source: 1998 data from Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System.

### **Native American Cultural Perspective on Grizzly Bears**

The grizzly bear holds a prominent role in the culture of many Northwest Indian Tribes. Native American Cultures are closely tied to the environments around them because of dependence upon natural resources for their livelihoods. The importance of this connectedness and dependence upon nature is reflected in the deliberate weak distinction between animals and humans. A central theme of Native American mythology is that the natural order of things along with the full compliment of animals species existed long before humans arrived. Mythology of northwest Indians is set in this time before the arrival of humans where animals were just like people leading human like lives and dealing with human like problems and concerns. Social and cultural lessons were taught and perpetuated through telling of these age old myths whose lessons were embedded in stories about the lives and activities of these "animal people". Cultures of interior northwest Indian Tribes have evolved and are perpetuated through these oral teachings. Because of the direct link between people and animals in Native American Cultures, it becomes circular reasoning to try and distinguish between animals with human abilities and humans with spiritual powers derived from animals. In the setting of myths, before people "arrived", animals lead distinctive human lives. After the "arrival" of people, humans took on religious and cultural significance from animals.

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The Bitterroot Grizzly Bear Experimental Population Area encompasses aboriginal homelands of several Inland Northwest Indian Tribes including the Salish, Kootenai, Nez Perce, Shoshone, and Bannock. For many of these Tribes, the grizzly bear was respected for its great size, demeanor, and strength (Antoine Incashola, Flathead Cultural Committee, pers. comm.). Grizzly bears were seldom killed for food and killing a grizzly was considered a great feat equivalent to killing two of ones enemies (Thwaites 1959). The grizzly bear also was admired for his abilities as a hunter, tracker, and fisherman (Allen Slickpoo Sr., Nez Perce Cultural Resources Program, pers. comm., Antoine Incashola, Flathead Cultural Committee, pers. comm.). Many of those who excelled in these skills choose the grizzly bear as their wiyakin; receiving their spiritual power from the grizzly bear. Many names of leaders, warriors, and prominent families of these Indian Tribes were connected to the grizzly bear. Such names include Little claw of the Grizzly, Standing Grizzly Bear, Grizzly Bear Tracks, Four Grizzlies, and Door of the Lodge Grizzly Bear (Allen Slickpoo Sr., Nez Perce Cultural Resources Program, pers. comm., Antoine Incashola, Flathead Cultural Committee, pers. comm.). Families of those who acquired their spiritual power or took their name from the grizzly, held the grizzly in deep respect and did not kill grizzly bears.

Nez Perce Treaty lands encompass a large portion of the PAA (Figure 3-1). The land in the PAA north of the Salmon river, particularly within the Clearwater drainage has provided the backdrop for Nez Perce culture for many thousands of years. In Nez Perce mythology, xaxats, or the grizzly bear, was a central figure representing a complicated if not opposing set of characteristics.

In contrast to being respected for its great size, strength and hunting abilities, xaxats is also often portrayed as a large strong brute with a perpetual bad demeanor and someone to be avoided. The grizzly bear was also more than a little gullible (Aoki 1973, Aoki and Walker 1989). In many stories the grizzly bear was respected and avoided if possible. However, in most stories recounting unavoidable dealings with xaxats, grizzly bear was always fooled and taken advantage of and always lost out in the end; a moral message regarding the inappropriateness of such traits in Nez Perce Society.

The grizzly bear is prominent in Nez Perce mythology and history playing a role in many of the major mythological and historical milestones. In the creation myth, grizzly bear is a character specifically mentioned when the monster eats all of the animal people. Grizzly bear is present inside the monster angry and confused as ever, confronting coyote as coyote comes to the rescue and through his plan destroys the monster and from it creates all of the races of people (Indian Tribes).

Preparing for the arrival of humans, it was grizzly bear and chipmunk who could not agree on the proper day length to give to the humans. As usual, grizzly bear lost out and now, thanks to chipmunk, we have a 48 hour day and night cycle (Alex Pinkham, pers. comm.). After the arrival of the humans, it was the grizzly bear who took in and cared for a young boy lost in the mountains and showed him the way through the Bitterroot Mountains over Lolo Trail (Clark 1966).

*Bitterroot Ecosystem - Social, Economic, and Cultural Information*

It was also grizzly bear who looked over and protected Watkuese, a Nez Perce woman who was venturing back to her people after being captured and sold to white people back east (Clark 1966). As history has recorded it, Watkuese is the woman who saved the lives of the Lewis and Clark expedition in the Weippe Prairie by convincing the Nez Perce leaders not to harm the expedition party because white people had helped her start on her journey back home.

Even after 50 years of absence, the grizzly bear is prominent in keeping Nez Perce culture alive; as Nez Perce culture has kept the spirit of the grizzly bear alive through song, stories, and name giving.

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**Table 3-22. A summary of the key characteristics of the Bitterroot Grizzly Bear Primary Analysis Area (PAA) which could potentially be affected by grizzly bear recovery.**

| Characteristic   | Central Idaho                          | Western Montana |
|--|--|-----------------|
| Land (in the 14-county area that encompasses the PAA)  |  |                 |
| Acres  | 22,687,424                             | 5,740,560       |
| % Federal Ownership  | 80                                     | 59              |
| % Private ownership  | 15                                     | 38              |
| % National Park, Wilderness, or Wildlife Refuge  | 17                                     | trace           |
| Public land uses <sup>a</sup>  |  |                 |
| Recreational visits/year to national forest lands in the PAA   | 8,576,995                              | 4,691,400       |
| Acres open to grazing on national forests included in the PAA  | 4,467,571                              | 348,400         |
| Acres suitable for timber harvest in national forests included in the PAA  | 4,387,831                              | 1,602,331       |
| Acres of timber projected for harvest annually on national forests included in the PAA   | 44,368                                 | 13,618          |
| Total miles of system roads on national forest lands in the PAA  | 17,111                                 | 9,053           |
| Miles of year-round open system roads on national forest lands in the PAA  | 7,448                                  | 4,114           |
| Miles of closed or restricted access system roads on national forest lands in the PAA  | 9,664                                  | 4,939           |
| Total miles of recreational trails on national forest lands in the PAA   | 12,439                                 | 2,350           |
| Miles of recreational trails open to motorized vehicles in the PAA   | 6,073                                  | 1,474           |
| People/Land Economy (in the 14-county area)  |  |                 |
| Population (numbers)   | 105,234                                | 135,694         |
| Population (people/mi. <sup>2</sup> )  | 3.0                                    | 15.1            |
| Total personal income for <u>Idaho and Montana</u> portions of the PAA (billions of dollars)   |  | 4.6             |
| Average per capita income for <u>Idaho and Montana</u> portions of the PAA (\$)  |  | 17,465.00       |
| Farm income for <u>Idaho and Montana</u> combined (% of total personal income)   | 0.7 (72% of this comes from livestock) |                 |
| Local services income for <u>Idaho and Montana</u> combined (% of total personal income)   |  | 41.5            |
| Other Industry income for <u>Idaho and Montana</u> combined (% of total personal income)   |  | 21.4            |
| Other non-earned <sup>b</sup> income for <u>Idaho and Montana</u> combined (% of total personal income)  |  | 36.5            |
| Livestock  |  |                 |
| Numbers of cattle in the 14-county area (spring) of the PAA  | 318,967                                | 72,560          |
| Number of sheep in the 14-county area (spring) of the PAA  | 41,687                                 | 7,358           |
| Number of livestock on national forest allotments in the PAA (May through October)   |  |                 |
| Adult cattle and calves  | 64,589                                 | 4,222           |
| Adult sheep and lambs  | 229,188                                | 0               |
| Horses   | 95                                     | 9               |
| Total livestock  | 294,732                                | 4,231           |
| Estimated current livestock mortality in the PAA and surrounding counties from all causes per year based upon spring cattle and sheep numbers <sup>c</sup> : |  |                 |
| cattle   | 12,314<br>3.3% loss<br>(69% calf)      |                 |
| sheep  | 9,366<br>16.8% loss<br>(~72% lambs)    |                 |
| horses   | unknown, very low                      |                 |

*Continued*



## *Affected Environment - Summary*

| Characteristic   | Central Idaho | Western Montana |
|--|---------------|-----------------|
| Ungulate Populations (postharvest estimates)             |               |                 |
| Elk  | 88,047        | 4,861           |
| Deer (mule & white-tailed)                               | >160,337      | 21,750          |
| Moose  | 1,700         | -               |
| Bighorn Sheep  | 1,330         | 280             |
| Mountain goat  | 1,573         | 178             |
| Total ungulate population                                | 252,987       | 27,069          |
| Ungulate Annual Harvest                                  |               |                 |
| Elk  | 6,149         | 934             |
| Deer (mule & white-tailed)                               | 17,184        | 3,480           |
| Moose  | 182           | 13              |
| Bighorn sheep  | 33            | 9               |
| Mountain goat  | 27            | 12              |
| Total ungulate harvest                                   | 23,575        | 4,448           |
| Percent of ungulate population harvested                 | 9             | 16              |
| Estimated ungulates dying/year (all causes) <sup>d</sup> | 182,509       | 16,977          |
| Percent of mortality attributable to hunting             | 13.0          | 26.0            |

<sup>a</sup> A wide variety of land-use restrictions (seasonal and permanent) are employed on public lands throughout the PAA for protection of natural resources and public safety including: on motorized vehicles, construction of structures, animal damage control activities, big game winter range, calving areas, security and migration habitat, raptor nest sites, endangered species, erosion control, wetland protection, to provide a variety of outdoor experiences (motorized or nonmotorized, wilderness or developed, etc.).

<sup>b</sup> Non-earned income represents investments, entitlements, and retirement income that often does not depend on where a person lives. The growth of this segment of the economy over the last 2 decades results from people with this type of income moving into central Idaho and western Montana because these areas are perceived to have a lifestyle that people want to participate in (wild spaces, abundant wildlife, less crowding, low crime, clean air, etc.).

<sup>c</sup> Source: U.S. Fish and Wildlife Service. 1994. The reintroduction of gray wolves to Yellowstone National Park and central Idaho. Final Environmental Impact Statement. U.S. Fish and Wildlife Service, Helena, MT.

<sup>d</sup> Including hunting, crippling loss, poaching, road kill, predation, disease, starvation, drowning, winter kill, accidents, fighting, etc.