OTHER RESOURCE VALUES

Timber Resources

Approximately 1.16 million acres of the basin are forested. Approximately 60 percent of the public and federal lands is considered tentatively suitable for harvest (See Table 24). Suitable timber is determined by identifying lands that produce, or are capable of producing, crops of industrial wood by reviewing information on land coverage, slope, soil types, aspect, and species type. Dominant timber tree species in the basin include ponderosa pine, spruce, lodgepole pine, and Douglas fir.

Timber harvest in the basin occurs under the direction of the U.S. Forest Service, the Idaho Department of Lands, and private interests, principally the Boise Cascade Corporation. The majority of the Forest Service lands are under the jurisdiction of the Boise National Forest. The Payette National Forest has a small area located in the northern section of the basin. Minor suitable timber acreage is found on U.S. Bureau of Land Management lands.

HISTORY

Timber resources have a long history of influence on the local economy of the Payette River Basin. In the early 1860s, Benjamin Warriner, later an Idaho City banker, owned a sawmill at Horseshoe Bend (Mills, 1963). By 1866 three sawmills were operating at "The Bend." In 1870 the first sawmill (water-driven) was built in Emmett (Lyon, 1968). Many mills were established around Emmett and Payette in the late 1800s. Logs cut from the mountains surrounding Garden Valley supplied the Emmett and Payette mills. Lumber from sawmills in Dry Buck Valley was carried by wagons down the road along Squaw Creek to the lower Payette and Boise valleys.

Table 24. Timber Acreage Suitable for Harvest in the Payette River Basin.

Owner/ Manager	Total Acres in Basin	Tentatively Suitable (acres)
Boise National Forest	916,629	566,536*
Payette National Forest	137,448	109,274*
Bureau of Land Management	178,362	16,428
State lands	130,365	n/a
Private	717,245	n/a
TOTAL	**2,080,049**	**692,238**

* Note: Based on current Forest Plans. These two national forests are currently revising their Land and Resource Management Plans.
Sources: Koski, 1997; Jones, 1998; U.S. Forest Service, Boise National Forest, 1990; and U.S. Forest Service, Payette National Forest, 1988.

Many loggers lived and worked in the woods most of the winter in order to bring logs to the sawmill via Payette River "drives" from mid-May until mid-June. Most of the logging crew followed the river drive and dislodged the logs jammed at bends and on gravel bars with peavey hooks and draft horses. To catch the logs as they came down stream, a boom was laid across part of the river near Emmett and at Payette (Mills, 1963; Lyon, 1979). To aid North Fork Payette river runs, a huge splashdam was erected below Smiths Ferry, impounding 36.5 acres of backwater. By 1918 the log drives were discontinued in favor of rail transport.

Long Valley's first sawmill was built and operated by Jackson Westfalls near Alpha, south of Cascade, in 1889. A few years later, in 1896, the Warren Dredge Company established the first sawmill on Payette Lake. Prior to World War I many sawmills operated in Long Valley, producing both railroad ties and lumber (Ingraham, 1992). Fire destroyed many of these mills and most were never rebuilt. The Boise Payette Lumber Company began a branch office in Cascade and later moved their operations to Cabarton. In 1924, J.P. Dion built a sawmill on the east side of Cascade, near the river. It has operated continuously since then and is now owned by Boise Cascade.

From 1914 to 1929, the McCall area was logged, with most timber processed at Hoff and Brown's mill in McCall. The Oregon Short Line Railroad, a branch of the Union Pacific, began service from McCall in about 1915. Large scale logging declined in the 1930s, although there were still a few small logging operations cutting timber (Ingraham, 1992). Some logging activity occurred north of Payette Lake during the 1930s and 40s. Log decks were built at the north end of the lake at North Beach. Logs were dumped in the lake and floated to the mill at McCall. The timber market rose through the 1960s, but slumped again in the 1970s. Many sawmills closed including the Boise Cascade mill in McCall. The Hoff and Brown sawmill in McCall operated until the late 1970s.

Some early logging occurred in the Squaw Creek drainage in the 1920s and 1930s in support of local homesteads and ranches. Large-scale timber harvest activities did not occur in the drainage until after World War II, particularly after 1960.

CURRENT TIMBER HARVEST AND FOREST PRACTICES

Timber harvest totals in the basin for the past five years (1993-1997) and planned for the next five years (1998-2003) are summarized in Table 25. Harvest volumes in the basin are projected to

Table 25. Timber Harvest and Estimated Value Between 1993 to 1997 and 1998 to 2003.

	1993 - 1997		1998 - 2003	
	Harvested (MMBF)	Estimated Value (millions)	Estimated Harvest (MMBF)	Estimated Value (millions)
National Forest	110.5	10.5	261.7	39.7
BLM	4.5	N/A	4.3	N/A
State lands	13.8	1.3	36.1	3.6
Private	225.0	186.0	225.0	186.0
TOTAL	**353.8**	**197.8**	**527.1**	**229.3**

MMBF = million board feet
Sources: Brevig, 1997; Roberts 1997; Clark, 1997; Marshall, 1997; Demetriades, 1997; and Jones, 1998.

increase almost 50 percent over the next five years, with the increased volume coming off national forest and state lands.

Although timber volumes can be estimated, actual harvest acres can be lower due to on-the-ground conditions and political constraints (Marben, 1997). The proposed Forest Service road policy, proposing an 18-month moratorium on road construction in roadless areas, may delay some of the planned sales for the period 1998-2003, resulting in a reduction of actual harvest volumes from that estimated (Giles, 1998). Additionally, other events, such as the bull trout listing and revision of Forest Plans, may result in decreased volumes harvested.

In the next five years (1998-2003), the total value of harvested timber is expected to increase disproportionately to total volume due to shifts in timber supply locations and average sale prices. On national forest lands the predicted values of timber and returns to the counties is estimated to increase by 279 percent (given all proposed harvest takes place), while total volume will increase only 137 percent (Table 26).

A summary of employment and income related to past and future estimates of timber harvest in the basin are shown in Table 27. Timber-related occupations are those associated with the harvest and processing of timber into lumber including loggers, equipment operators, and mill workers. Employment-related income is the aggregate salaries of timber-related employees. Although employment (jobs) and related income are estimated to increase,

Table 26. National Forest Timber Harvest Volumes/Values and Returns to Counties.

	1993-1997			1998-2003		
	Harvest Vol. (MMBF)	Harvest Value	Return to Counties**	Estimated Vol. (MMBF)	Estimated Value *	Return to Counties**
TOTAL	110.5	$10,483,077	$2,620,768	261.7	$39,731,918	$9,912,979
Net increase				137%	279%	278%

*Timber values are estimated on actual sale prices recorded in 1993-1997 sale records.
**Returns to counties are figured at 25% of Harvest Value.
MMBF = million board feet
Sources: U.S. Forest Service, Boise National Forest, 1993-1997a and b; and Demetriades, 1997.

Table 27. Income and Employment from Timber- Related Activities.

	1993-1997		1998-2003	
	Timber- Related Employment	Employment-Related Income (1000's)	Estimated Timber-Related Employment	Estimated Employment-Related Income (1000's)
TOTAL	2,212	$101,675	4964	$230,708
Net increase			124%	126%

Multipliers for both timber-related employment and income were calculated from the Timber Sale Program Annual Report FS-591 for both the Boise and Payette national forests.
Sources: Schuster, et al., 1996; and U.S. Forest Service, 1996.

actual amounts cannot be guaranteed. Factors influencing actual timber harvest can reduce potential harvest volumes dramatically. Most notably, the closure of Boise Cascade Corporation's Horseshoe Bend Mill will result in a loss of jobs.

A high percentage of state land in the Payette River Basin is managed for commercial timber production under the responsibility of the Payette Lakes (McCall) and the Southwest Idaho (Boise) supervisory areas within the Idaho Department of Lands. Harvest volume and value on state managed lands are summarized in Table 25 (page 90). Timber harvested on state lands between 1993 and 1997 comprised almost 4 percent of the total harvested volume in the basin. Future volumes are estimated to increase 162 percent over the next five years.

Boise Cascade Corporation is a major landowner of private commercial forest land in the basin. The corporation currently operates two mills in the basin in Cascade and Emmett. A third mill in Horseshoe Bend was recently closed. Boise Cascade obtains 70 to 80 percent of its Idaho timber supply from state and federal lands (Malany, 1998).

Mineral Resources

The Payette River Basin has been the site of mineral interest and activity for over 125 years. Mining districts were set up for placer gold; one was set up for coal. Over 125 mines and prospects are located in the basin. Mining exploration and production has been sporadic over time, but there has been consistent general interest (Idaho Geological Survey, 1997). Mines and prospects within the Payette River Basin are shown in Map 17.

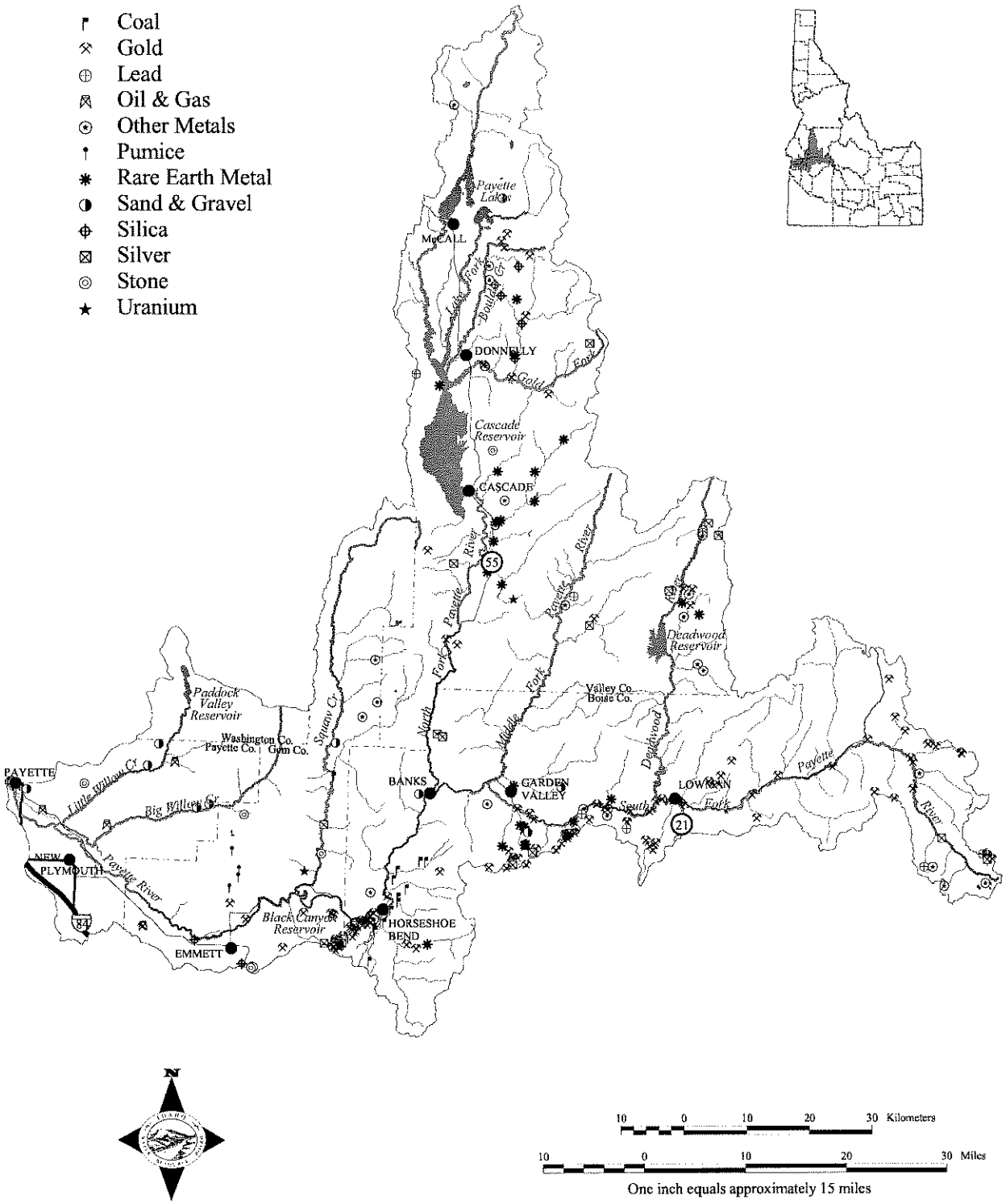
Important mineral commodities in the Payette River Basin are sand and gravel, and industrial quality silica sand. Less abundant and of uncertain value are impure forms of clay, limestone, diatomite, and pumice. Sandstone, arkose, and basalt are available as dimension stone. Several unsuccessful attempts have been made to develop oil and natural gas in the lower basin. Neither hydrocarbon resource appears to be present in commercially valuable amounts (Savage, 1961; Rains, 1991).

Sand and Gravel - Sand and gravel production comprises the largest mineral industry in the basin. Deposits are readily available in the larger valleys and near rivers and streams (See Map 17). State, county, and private sand and gravel operations are located near rivers and streams near Lowman, Garden Valley, and Horseshoe Bend, but are not operating in the stream channel. Major production is from alluvial gravels. The Idaho Department of Transportation and the County Highway Districts are the largest consumers of natural and manufactured aggregates.

The value of sand and gravel produced in the basin over the past five years was almost ten times that of gold, silver, lead, and zinc produced for the same period (Gillerman, 1997b). Future gravel demands are expected to increase from construction in the Treasure Valley near Boise. For this reason, gravel extraction locations should be prioritized for future uses (Gillerman, 1997b).

Silica - Unimin Corporation, the largest silica sand producer in the United States, operates a plant at Emmett and is the only industrial silica sand producer currently operating in Idaho. The sand is marketed mainly in the Pacific Northwest for container glass, foundry molds, sand blasting, filtration, and roofing granules. Unimin is also the leading supplier of golf course bunker sand in the United States. Gem Silica Company, a predecessor to Unimin Corporation, started operations at Emmett in 1949 (U.S. Bureau of Mines, 1962).

Map 17. Mines and Prospects



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The silica sand is mined from the Idaho Formation, which was deposited during the Pliocene and Pleistocene in a piedmont plain environment with shallow lakes that fluctuate in size and water depth. This sand, along with gravel, silt, and clay, was derived from the erosion of granite and quartz monzonite of the Idaho Batholith. When washed and screened, the product yields 85 percent silicon dioxide (quartz).

Gold and Other Metallic Minerals - Gold deposits are considered sparse in the Payette River Basin, without significant concentrations to currently warrant commercial mining (Gillerman, 1997b). Most gold produced in the Payette River Basin was gold dust widely disseminated through gravel and sand placer materials (Ross and Savage, 1967). Placer gold deposits in most mining districts were characterized by only a few very rich concentrations of gold. Some modern exploration for hard rock gold has taken place near Emmett and Horseshoe Bend, but no commercial resource has been discovered.

The Deadwood Mine, located north of the Deadwood Reservoir along the Deadwood River, was a significant base metal producer, with lead, zinc, gold and silver ore. Exploration of a molybdenum prospect occurred in the 1970s on the South Fork Payette near Little Falls.

In the lower basin, known metallic mineral resources are limited. Near Horseshoe Bend the Pearl mining district yields gold, silver, lead, and zinc from veins in the Idaho Batholith and Eocene intrusive rocks. In the past, extensive placer operations were located in the Rock Creek headwaters, on the Payette side of Crown Point. However, most past mining ventures and all current operations are on the Boise side of the divide, along the north fork of Willow Creek. Minor amounts of gold, silver, copper, lead, and zinc are found in stream beds. However, mining activity within stream beds is limited to recreational dredging at this time. Silver and copper have been reported to occur in the Squaw Creek district a few miles north of Montour. However, Savage (1961) could not find verification nor any signs of mining activity in the "district" during field investigations. Considering present conditions, including the price of gold, the known quantity of metallic minerals in the Payette River Basin does not constitute a major mineral resource.

Thorium and Rare Earth Metals - Thorium is frequently found in placers. The most important thorium mineral is monazite. Some of the richest and most productive of the monazite placers are those in Long Valley, especially near the mouth of Big Creek, in the vicinity of Cascade. The monazite dredges suspended operations when purchases by the Atomic Energy Commission ceased, the only market for the recovered material (Murray, 1999; Cook, 1957).

Feldspar - Although there appear to be no markets for feldspar produced in Idaho, the Payette River Basin is a potential producer of feldspar. Along the borders and within the interior of the Idaho batholith are thousands of pegmatites of all sizes, a number of which are potential producers of commercial quantities of feldspar. Commercial grade clay and feldspar are the two necessary ingredients of a ceramic industry. A number of claims cover the west ridge of Wash Creek in the Garden Valley District.

Uranium - Pegmatites in the Garden Valley area are known to contain uranium minerals. None of these pegmatite deposits, however, have commercial potential. Low-grade uranium-bearing lignites occur in Payette County. These beds are a potential low-grade source of uranium. Uranium-bearing radioactive black minerals are found in most of the gold-monazite placers of central Idaho.

Garnet - Placer deposits in the Gold Fork-Little Valley area contain large quantities of garnet-bearing gravel.

Pumice - Pumice deposits in Idaho are large enough for the state to rank fourth in national production. Map 17 (page 93) shows locations of active mines in the Payette River Basin. The major use of pumice is in the construction industry, where it is used in concrete, building block, and as plaster aggregate.

Dimension stone - Dimension stone is any stone which is quarried, cut, shaped, and possibly polished for structural, architectural and ornamental applications. The rock is usually gathered from where it lies loose on the ground, loaded onto flatbed trucks, and shipped to local and regional building supply dealers. Dimension stone mined in the Payette River Basin includes sandstone and basalt.

Oil and Gas - Like most of Idaho, the Payette River Basin is generally underlain by rocks that are not favorable either as source rocks or reservoir sites for oil or gas; the lithologic, structural, and environmental conditions of deposition are all generally adverse (Idaho Bureau of Mines and Geology, 1923). Deposits in the Payette River Basin are fluviatile and lacustrine in origin and not marine, as is the case in large producing fields. There are no filings for oil and gas leases in the basin at this time.

Eight wells drilled in Gem County and thirteen wells drilled in Payette County have failed to produce commercial quantities of natural gas or oil. Plans for exploiting envisioned reserves of natural gas and oil have waxed and waned sporadically in southwest Idaho for about 100 years. As early as 1908, a well drilled 10 miles north and three miles west of Emmett in Sand Hollow reportedly produced some natural gas (Savage, 1961). Additional wells were drilled over the periods 1926-35 and 1955-56. Many of the water wells drilled in the Payette area yield gas from small pocket accumulations. After several days, natural gas ceases to flow in the wells. Savage (1961) reported that one well produced 75 million cubic feet of gas per day for a short period then ceased to flow.

There is no geophysical or drilling activity occurring in the basin at this time. Low prices of oil and gas have had the effect of greatly reduced petroleum exploration all over the U.S. Leasing and exploration in an extremely speculative area, such as the Payette River Basin, will most likely be minimal in the immediate future. Beyond the immediate future, exploration in the basin will probably be cyclical and vary with the economics of the oil and gas industry.

Coal - There are currently twelve coal mines registered within the Payette River Basin. Coal for local consumption has been mined in the Horseshoe Bend area in Boise County. Coal occurring in the Horseshoe Bend area is found in Tertiary sediments of the Payette Formation which consists of sand, shale, and clay interbedded with thin seams of subbituminous and lignite coal. The Henry Mine operated in 1910 and produced subbituminous coal. In 1938 lignite was mined from a 4-foot-thick bed at the Gaston Mine. Coal in the Horseshoe Bend area is not currently an economic commodity, because it does not occur over a large-enough area nor does it have a consistent thickness or quality (Gillerman, 1997b).

Energy Supply And Conservation

Most of the early basin electric generating plants developed in the basin were steam driven. Sawdust burning plants were started in Payette in 1903 by J.W. Prestel & Sons and in Emmett in 1904 by a predecessor of the Emmett Power & Water Co. These steam plants, the Horseshoe Bend hydroelectric plant, and service territories were purchased between 1907 to 1909 by Idaho-Oregon Light & Power Company. This company and five

other companies across southern Idaho reorganized in 1915-16 through an intermediary company, the Electric Investment Company, to become Idaho Power Company. Steam production was terminated shortly after reorganization.

ENERGY SUPPLY

Today electrical energy to meet the growing consumer needs of the Payette River Basin is provided by the Idaho Power Company. Most of this energy is produced by company-owned hydropower facilities located along the Snake River outside the Payette basin and coal plants in Wyoming and Oregon. The Company's 12.8 megawatt plant at Cascade Dam on the Payette River is its only generation facility in the basin.

Additional electric power generation in the basin occurs at the U. S. Bureau of Reclamation's 8.0 megawatt generator at Black Canyon Dam near Emmett. The Horseshoe Bend Power Plant is a refurbished facility using water diverted from the Payette River at Horseshoe Bend to generate 9.5 megawatts of power for sale to the Idaho Power Company. Boise Cascade Corporation burns sawmill waste at its Emmett sawmill to generate 13 megawatts of electricity which is also sold to the Idaho Power Company (Fleischman, 1997). The basin also has independent power production at several locations where utility line extension is impractical or cost prohibitive. One of the most conspicuous applications of photovoltaic generation in Idaho is a solar-powered subdivision located on Horseshoe Bend Hill (Eklund, 1997).

The electric power customer base in the Payette River drainage grew an average of 4.6 percent per year between 1991 and 1995. The highest growth in the drainage was McCall at 3.9 percent and Cascade at 3.8 percent (Idaho Power Company, 1996). Households in the Payette River Basin are predicted to increase almost 14 percent in the next five years, and 30 percent by 2010. Demand for electrical power in the Payette River Basin has been rising steadily since 1990, while use per customer has declined (Idaho Power Company, 1996). In 1990, average electrical consumption per residential customer was 14,340 kilowatt-hours and decreased to an average 13,430 kilowatt-hours in 1996 (Idaho Power Company, 1991 and 1996). The reduction in use per customer may be due to the increased use of propane for heating, with some decreased use due to the Idaho Residential Energy Standard for site-built homes and the Super Good Cents® certified energy efficiency program for manufactured homes.

Much of residential energy usage is for seasonal or occasional service to second homes near McCall, Cascade, and the South and Middle Forks of the Payette River. Space heat in the upper part of the basin is provided by electricity, propane, and wood, with most homes having electric heat, although recently propane has become more popular. Most hot water is heated with electricity. Electricity also provides all the lighting, refrigeration, and most of the cooking.

Throughout the basin demand for electricity peaks in the winter, contrary to Idaho Power's system load which peaks in the summer. This is due to the preponderance of residential and commercial loads in the basin which use more for space heating and lighting during the colder, darker months. Outside the basin, loads are influenced by irrigation pumping which leads to summer peak demand. (Idaho Power Company, 1996).

ENERGY CONSERVATION

Energy conservation is defined as the more efficient use of energy by using less energy to produce a given service at a desired amenity level. Available conservation programs designed to increase energy use efficiencies can play a major role

in meeting part of the present and future increases in energy needs. The Northwest Energy Code, Model Energy Code, and other locally-adopted building codes support modern conservation standards for new building construction. Other conservation advancements are also becoming increasingly feasible.

The Energy Division of the Idaho Department of Water Resources provides information, technical assistance, and marketing to promote cost-effective conservation and the efficient use of energy resources. Owners of new and existing commercial buildings and existing residential buildings may apply for low-interest loans from the Energy Division. These loans finance the installation of energy savings measures which have a simple pay back period of less than 10 years.

While not part of any established conservation program, conversions to alternative sources of energy have been proposed to reduce dependence on over-committed sources. Main alternative energy sources include use of Idaho's geothermal energy, renewable wood products, solar, and wind resources. A geothermal energy source is used at Terrace Lakes to heat water in the swimming pool. Use of wood for space heating has been very popular in the Payette River Basin, but potential problems with air pollution and overuse of supplies make it less attractive.

Application of solar energy for space heating and production of electrical energy has not been used extensively in the basin, primarily due to the costs of development. Some houses are sited to take advantage of solar gain during the winter, and a few photovoltaic installations have been attempted on individual facilities, but none are of utility scale. Even the best commercially available solar cells are relatively inefficient and not effective for large-scale use in Idaho where electric kilowatt-hour rates are generally below 5 cents per kilowatt-hour (Idaho Department of Water Resources, 1994). Wind power has not been found commercially feasible, because winds are not of sufficient sustained velocity to constitute a reliable power resource. Even brief lulls in wind speed can reduce the reliability of wind-powered generators below the threshold of usability.

The current move toward electric power deregulation may have significant impacts upon power generation and distribution throughout Idaho, as well as on hydropower-related water use demands (Eklund, 1997). Recent Federal Energy Regulatory Commission orders have allowed for bulk power users (such as manufacturing facilities) to purchase power from any willing supplier, and require local utilities to transmit (wheel) the power over their lines. If the state of Idaho decides to implement deregulation, "retail wheeling" may also occur. This could allow power purchasers at any level to buy power from whomever they choose at whatever rates they can negotiate. If fully implemented, deregulation could have an overall "equalizing" affect on power costs, lowering the costs in high rate areas and raising the costs in low rate areas such as Idaho.

The potential utility deregulation has already affected the ability of utilities to continue aggressive programs promoting energy efficiency in residences. Idaho Power's Good Cents® Program trained builders in energy efficient construction and gave them incentives to build more efficient homes. As a result, most homes built in Valley County had highly efficient low emissivity windows and insulated floors. Both measures are cost-effective given the county's climate. When the program ended in 1994, builders stopped using low emissivity windows and insulated the crawl space perimeter instead of the floor, resulting in much greater heat loss. Many new homes are being built throughout the upper basin to

a much lower energy standard than is recommended for the climate (Keithley, 1997). The increase in energy use above the Good Cents standard is approximately 50 percent per home (Idaho Department of Water Resources, 1997a).

Another example of the effect of utility deregulation is in the manufactured housing sector. Manufactured homes account for approximately 40 percent of the new residences in the basin (Matthews, 1997). From April 1992 to August 1995, the region's utilities provided incentives to the manufactured housing industry to build highly energy efficient homes that rely on electric heat. During this period 100 percent of the new manufactured homes (403 homes) in the basin were certified energy efficient. After the incentives ended, certified efficient homes have continued to be available, but only about nine percent of the manufactured homes meet the program standards. The difference in energy performance between certified energy efficient homes and the standard product ranges from 35 percent to 60 percent more space heating energy used (Eklund, 1997).

Fish and Wildlife Resources

FISHERIES

The major river branches of the Payette River Basin originate in the Sawtooth and Salmon River mountains and flow through a variety of environments, ranging from elevations exceeding 10,000 feet to 2,125-foot elevation at the Snake River confluence. This range in elevation contributes to a diversity of aquatic habitats for cold and warmwater fish (Idaho Department of Fish and Game, 1996). Annual migration runs of anadromous fish, which once thrived in the basin, have been eliminated by construction of the Hells Canyon and Black Canyon dams. The abundance, diversity, and migration patterns of many remaining native salmonids have been altered by habitat modifications and introduced fish populations.

There are three large reservoirs in the basin - Deadwood, Cascade, and Black Canyon -- and several large natural lakes that were impounded for irrigation storage -- Upper Payette Lake, Little Payette Lake, and Payette Lake. These reservoirs and lakes sustain important fisheries in the basin. There are almost 180 natural alpine lakes in the basin, about half of which are stocked with various game fish species (Idaho Department of Fish and Game, 1996). In many of the lakes, brook trout were stocked in the 1940s and 1950s. Rainbow trout, westslope cutthroat trout, rainbow-cutthroat hybrids, brown trout, and lake trout have been stocked since the 1960s, along with arctic grayling. Before the days of stocking, most of the alpine lakes were barren of fish, but did have native amphibian and invertebrate populations.

Table 28 lists coldwater and warmwater game species found in basin waterways. Table 38 (page 128) in the *Recreation* section identifies river reach locations for specific species. A description of fisheries and habitat for the three subbasins follows. Bull trout, listed as threatened under the Endangered Species Act, are discussed in the *Federally Listed Threatened and Endangered Species* section.

North Fork Payette Subbasin

North Fork Payette: Headwaters to Payette Lake Outlet - Prior to the turn of the century, the fish habitat for the North Fork Payette River and Payette Lake were described as near-pristine (Gilbert & Evermann, 1894). Species described in Payette Lake included three-toothed lamprey (*Lampetra spp.*), black sucker (*Catastomus spp.*), Columbia River sucker (*Catastomus spp.*), northern squawfish (*Ptychocheilus spp.*), steelhead trout (Oncorhynchus mykiss), mountain whitefish, chinook, sockeye,

Table 28. Cold and Warmwater Game Fish Species in the Payette River Basin.

Coldwater Species	Warmwater Species
mountain whitefish (*Prosopium williamsoni*)	smallmouth bass (*Micropterus dolomieu*)
rainbow trout (*Oncorhynchus mykiss*)	largemouth bass (*Micropterus salmonides*)
brown trout (*Salmo trutta*)	black crappie (*Pomoxis nigromaculatus*)
westslope cutthroat trout (*Oncorhynchus clarki lewisi*)	bluegill (*Lepomis macochirus*)
bull trout (*Salvelinus confluentus*)	yellow perch (*Perca flavescens*)
brook trout (*Salvelinus fontinalis*)	pumpkinseed (*Lepomis gibbosus*)
kokanee salmon (*Oncorhynchus nerka kennerlyi*)	brown bullhead (*Ameiurus nebulosus*)
coho salmon (*Oncorhynchus kisutch*)	channel catfish (*Ictalurus punctatus*)
rainbow-cutthroat hybrid	flathead catfish (*Pylodictis olvaris*)
splake (lake trout - brook trout hybrid)	
arctic grayling (*Thymallus arcticus*)	
lake trout (*Salvelinus namaycush*)	
fall chinook salmon (*Oncorhynchus tshawytscha*)	

Source: Idaho Department of Fish and Game, 1996.

kokanee, cutthroat trout, bull trout, sculpin (*Cottus spp.*), western dace (*Rhinichthys spp.*), and shiners (*Richardsonius spp.*). The chinook spawned in the tributaries, arriving in September. Sockeye spawned in Payette Lake between August and late October, and steelhead ran up all tributaries during high water in April (Ames, 1982). According to Gilbert and Evermann (1894), the North Fork Payette River was so dense with salmon that early settlers had to drive fish away before horses would ford the river. More than 25,000 sockeye salmon were reportedly captured at the Payette Lake Outlet (Big Payette Lake Technical Advisory Committee, 1997). The sockeye runs were eliminated with the construction of Black Canyon Dam.

The Payette Lake kokanee population has persisted, and now spawns along the lake shore and in the North Fork Payette River above the lake. Recently, the kokanee population increased dramatically (Big Payette Lake Technical Advisory Committee, 1997). Between 1988 and 1996, the adult spawning run increased from 2,000 to 65,000 individuals. Spawning activity in the North Fork Payette River also increased.

Lake trout were introduced to Payette Lake in the 1950s and cutthroat trout in 1988. Lake trout provide a trophy fishery with about half the lake trout exceeding 15 pounds in 1988 (Big Payette Lake Technical Advisory Committee, 1997). Tributaries to Payette Lake and the North Fork Payette River contain good populations of rainbow trout, cutthroat trout, and brook trout.

A unique population of the Pennask strain of rainbow trout is found in Little Payette Lake; its only location in Idaho (Janssen and Anderson, 1992). For a three-year period prior to 1994, Idaho Department of Fish and Game found that largescale suckers and squawfish had increased significantly in Little Payette Lake, threatening the trophy rainbow trout fishery (Janssen, et al., 1994b). Almost 90 percent of the fish biomass in the lake consisted of large-scale suckers and squawfish (Janssen and Anderson, 1993). The current fish community

consists of rainbow trout, kokanee, smallmouth bass, redside shiners, large-scale suckers, and northern squawfish.

Before fish stocking began in the 1940s, most of the alpine lakes in the North Fork Payette watershed contained no fish (Brunner, 1995). Twenty of the thirty alpine lakes in the North Fork Payette watershed are now stocked with rainbow trout, cutthroat trout, or arctic grayling. Five of the eight lakes in the trophy mountain lakes program of the Idaho Department of Fish and Game are located in the upper North Fork Payette basin, and include Brush Lake, Blackwell Lake, and Louie Lake. These are managed as trophy fisheries with a 20-inch minimum catch size and two fish limit (Grunder, 1996; Anderson, 1996).

North Fork Payette: Payette Lake Outlet to Cascade Reservoir Dam---The native fish species of the Long Valley area include rainbow trout, whitefish, bull trout, and kokanee, and once included migratory runs of steelhead, chinook, and sockeye (Arnold, 1984). The northern squawfish is a native species which spawns in large numbers in the North Fork Payette between Cascade Reservoir and Payette Lake from late May to early June (Anderson, 1996). The Idaho Department of Fish and Game has indicated that instream flow maintenance below Payette Lake is critical for trout survival, particularly because the fish depend on this and other reservoir tributaries as refuges when water quality in Cascade Reservoir is poor (Anderson, 1996). Other issues affecting the fishery include development on the North Fork Payette floodplain below Payette Lake to Hartsell Bridge (the upper end of Cascade Reservoir) which may have a detrimental impact on the riparian community and the fish habitat (Anderson, 1997).

Cascade Reservoir has had one of the most productive and diverse fisheries in the state (EDAW, Inc., 1991). At one time or another, it has had good populations of yellow perch, rainbow trout, coho, kokanee, chinook, mountain whitefish, northern squawfish, largescale suckers, and black and brown bullheads. Perch fishing is very popular in summer and winter, as is year-round fishing for rainbow trout and coho salmon. The reservoir provides productive habitat for both warm and coldwater species, because of a broad, shallow shoreline habitat which is productive for benthic invertebrates and aquatic vegetation (U.S. Forest Service, et al., 1990).

The present water quality conditions in the reservoir favor yellow perch and nongame species. Salmonid survival is marginal because of water quality conditions, including low dissolved oxygen under winter ice and late summer algal blooms caused by phosphorus loading (EDAW, Inc., 1991).Reservoir drawdowns during summer irrigation releases can also reduce fish habitat.

The tributaries, particularly North Fork Payette River, Gold Fork River, and Lake Fork Creek, provide an important sanctuary function when water quality conditions in the reservoir deteriorate (Anderson, 1996). The major tributaries to Cascade Reservoir are closed to fishing during the spring salmonid spawning period. The west side tributaries are also important salmonid spawning areas.

Riparian vegetation removal along the tributaries result in increased erosion and water temperatures that hinder salmonid spawning. Fish passage is a concern on Lake Fork and Gold Fork because of diversion structures and dewatering. Sediment which can cover habitat for fish food (macroinvertebrates) and spawning beds is also a concern in both drainages.

North Fork Payette: Cascade Reservoir Dam to Banks--Native fish species once included

rainbow trout, mountain whitefish, kokanee, and migratory runs of steelhead, chinook, and sockeye (Arnold, 1984). The current species list includes wild trout, mountain whitefish, yellow perch, brown trout, and bullhead. From Cascade Dam to Cabarton Bridge, the river contains some hatchery rainbow trout, yellow perch, and mountain whitefish (Anderson, 1996). The reach from Cabarton Bridge to Smiths Ferry contains a more productive fishery because of its largely unaltered character, compared to reaches upstream and down (Idaho Department of Fish and Game, 1996). The fish in this reach have self-sustaining populations, with active spawning in both the North Fork Payette and tributaries. From Smiths Ferry to Banks, the river has been altered by railroad and highway construction providing a marginal salmonid fishery (Idaho Department of Fish and Game, 1996). Species present are predominantly wild rainbow trout, with a few hatchery rainbows, and northern squawfish.

Horsethief Reservoir is a small impoundment on the east side of Long Valley that supports a varied fishery. Rainbow trout, rainbow-cutthroat hybrids, cutthroat trout, brook, brown, yellow perch, bullhead, and splake are among the variety of species stocked there (Idaho Department of Fish and Game, 1996; Allen, et al., 1995b; and Reid, 1979).

South Fork Payette Subbasin

The aquatic habitat of the South and Middle Fork Payette River drainages are unique because they contain only one impoundment -- Deadwood Reservoir. The rest of the drainage is free-flowing, containing a wide variety of habitat types. The South Fork Payette River contains wild rainbow trout, brook trout, westslope cutthroat trout, bull trout, mountain whitefish, sculpin, large-scale sucker, and several species of dace (Grunder, 1996). River sampling has also identified northern squawfish, bridgelip sucker, and redside shiner (Allen, et al., 1995a). The drainages are situated in unstable, granitic parent material, so much sediment has entered and been entrained in the system. Sediment causes decline in suitability of available fishery habitat by filling in substrates and pools which are important for spawning, rearing, and holding areas (Grunder, 1996). Sedimentation in these drainages are the result of human-caused and natural events.

Deadwood River – Deadwood River above Deadwood Reservoir is a wild rainbow trout fishery and an important kokanee spawning area (Grunder, 1996). The streams which flow directly into Deadwood Reservoir are inhabited by wild and hatchery rainbow trout, westslope cutthroat trout, introduced cutthroat - rainbow hybrids, mountain whitefish, and brook trout. Deadwood Reservoir contains a salmonid fishery, with good populations of westslope cutthroat trout, kokanee, and wild rainbow trout (Yundt, 1996). Other fish species include bull trout, brook trout, mountain whitefish, and fall chinook (Idaho Department of Fish and Game, 1996). Resident salmonids in the reservoir use Trail, Moulding, and South Fork Beaver creeks for spawning and rearing young fish.

Kokanee were introduced into Deadwood Reservoir in 1963 (U.S. Forest Service, Boise National Forest, Lowman Ranger District, 1992). An estimated seventy to eighty percent of the kokanee spawn in the Deadwood River. Heavy kokanee spawning also occurs in Wild Buck, Basin, and Trail creeks in late August into September. In an attempt to control kokanee populations, Atlantic salmon were planted in Deadwood Reservoir in 1990, and rotenone was applied to lower Trail and Beaver creeks in 1992. Drought, coupled with low reservoir water levels, in 1993-94 further reduced the number of kokanee, stabilizing the population (Allen, et al., 1996; Mabbott and Holubetz, 1989).

The fish community below the Deadwood Dam consists of westslope cutthroat trout, rainbow-cutthroat hybrids, wild and hatchery rainbow trout, brook trout, bull trout, mountain whitefish, kokanee, shorthead sculpin, and suckers (Grunder, 1996; Yundt, 1996). Limiting factors to the fishery include temperature fluctuations, low winter flows, and sediment from timber harvest and road construction (Yundt, 1996). A study conducted by Idaho Department of Fish and Game in 1979 concluded a minimum stream flow of 125 cubic feet per second from September 1 to March 31 was needed for fishery maintenance below the dam (Cochnauer and Hoyt, 1979). Currently a negotiated flow of 50 cubic feet per second is released in the winter.

Middle Fork Payette River -- The Middle Fork Payette River is a key bull trout watershed above Lightning Creek (Batt, 1996). In addition to bull trout, the Middle Fork and tributaries have good populations of wild and hatchery rainbow trout, brook trout, westslope cutthroat trout, mountain whitefish, and sculpin (Grunder, 1996). Sediment from residential development, road construction, and stream channelization threatens fish habitat in the lower half of the drainage (Reid and Mabbott, 1987).

Main Payette Subbasin

The river and tributaries above Black Canyon Reservoir contain predominantly coldwater species, including wild rainbow trout, bull trout, westslope cutthroat trout, brook trout (in Squaw Creek), and mountain whitefish, and some warmwater species such as smallmouth and largemouth bass (Idaho Department of Fish and Game, 1996; Yundt, 1996). Black Canyon Reservoir supports a marginal fishery because sedimentation has covered most habitat (Idaho Department of Fish and Game, 1996). Squaw Creek, a tributary to the Payette River at Black Canyon Reservoir, is designated a key bull trout watershed (Batt, 1996). Sage Hen Reservoir, located on a tributary to Squaw Creek, supports good rainbow, rainbow-cutthroat hybrid, and brook trout fisheries (Idaho Department of Fish and Game, 1996).

The Payette River below Black Canyon Dam is a mixed fishery (Idaho Department of Fish and Game, 1996). From Black Canyon Dam to Letha smallmouth bass, rainbow trout, and mountain whitefish predominate, but below Letha northern squawfish, suckers, and smallmouth bass prevail (Yundt, 1996). Viable populations of wild rainbow trout and brook trout are found in some tributaries, including Big and Little Willow creeks. The black crappie and largemouth bass fisheries in Paddock Valley Reservoir are considered good (Idaho Department of Fish and Game, 1996).

WILDLIFE AND WILDLIFE HABITATS

The numerous wet meadows and riparian communities in the basin are dominated by willows, cottonwood, red alder, and numerous shrub species. The fourteen plant species listed in Table 29, occurring in wetlands and riparian areas in the basin, are regarded as sensitive by the Conservation Data Center of the Idaho Department of Fish and Game. Sensitive species are considered at risk, because of low numbers, limited distribution, or other factors. No plants listed as threatened or endangered under the Endangered Species Act have been identified in the basin.

Riparian habitats offer food, water, and cover for a majority of the wildlife species in the basin. Mule deer and elk commonly utilize the riparian corridors of the main Payette and North Fork Payette. The riparian areas also provide critical winter range for big game species. The Deadwood River corridor and tributaries are major migration routes for elk. Whitetail deer, bobcat, black bear, mountain lion, coyote, pine marten, red fox, mink, river otter, and beaver inhabit the riparian corridors,

Table 29. Sensitive Plant Species in the Payette River Basin.

Common Name	Scientific Name
Globally Rare (Species that are rare throughout their entire range)	
Aase's Onion	*Alium anceps*
Swamp Onion	*Alium tolmiei var. persimile*
Meadow Milkvetch	*Astragalus drummondii*
Pored Lungwort	*Meesia longiseta*
Slick Spot Peppergrass	*Lepidium papilliferum*
Idaho Douglasia	*Douglasia idahoensis*
State Rare (Species that are rare in Idaho, but more common elsewhere)	
Bronze Sedge	*Carex breweri var. paddoensis*
Mt. Shasta Sedge	*Carex tumulicola*
Pale Sedge	*Carex luzulina var. atropurpurea*
Cusick's Camas	*Camissonia palmeri*
Sierra Sanicle	*Sanicula graveolens*
Tobias' Saxifrage	*Saxifraga bryophora var. tobiasiae*
Rush Aster	*Astragalus amblytropis*
Kellogg's Bitterroot	*Lewisia kelloggii*

Source: Idaho Department of Fish and Game, Conservation Data Center, 1998.

and common mergansers and Canada geese over-winter and nest on river islands, particularly on the main Payette below Banks.

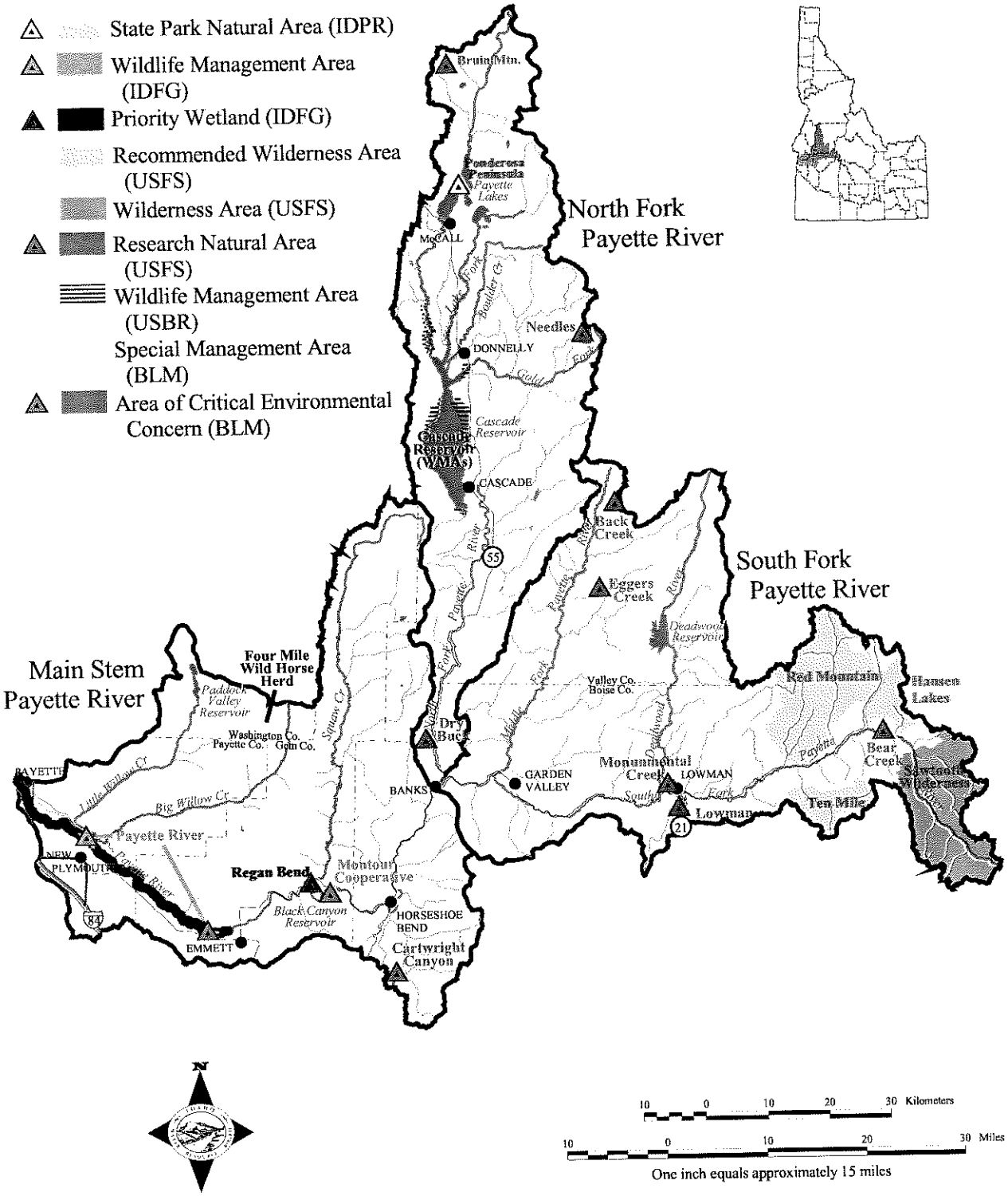
Other vegetation communities in the basin fall into two broad categories: upland coniferous forest and lowland sagebrush. The coniferous forest is dominated by Douglas fir, ponderosa pine, and lodgepole pine. The sagebrush communities have associations, primarily with grasses, including wheatgrass, Idaho fescue, bluegrass, cheatgrass, and needlegrass.

Wildlife and habitat found in the Payette River Basin is described by subbasin in the following section. Map 18 depicts the location of special management areas that provide important fish and wildlife values. Map 19 identifies some of the wildlife habitat in the basin.

North Fork Payette Subbasin

Area cultural history suggests that, except for the grizzly bear and gray wolf, wildlife species composition in the upper subbasin is generally the same today as when the first settlers arrived, although some species abundance has changed. The fisher and wolverine are nearly gone (Arnold, 1984). Elk, mule deer, and whitetail deer are now the dominant big game herbivores, while bighorn sheep and mountain goats are of limited distribution. Mule deer populations are stable on the Payette National Forest, but elk have steadily increased since 1917 (Brunner, 1995). Moose are present, but have never been a dominant species. The mountain goat population diminished around 1920 and again in the 1970s from range competition and hunting pressure. Other mammal species found in the area include black bear, mountain lion, snowshoe hare, beaver, mink, marten, muskrat, river otter, fisher, pine squirrel,

Map 18. Special Management Areas



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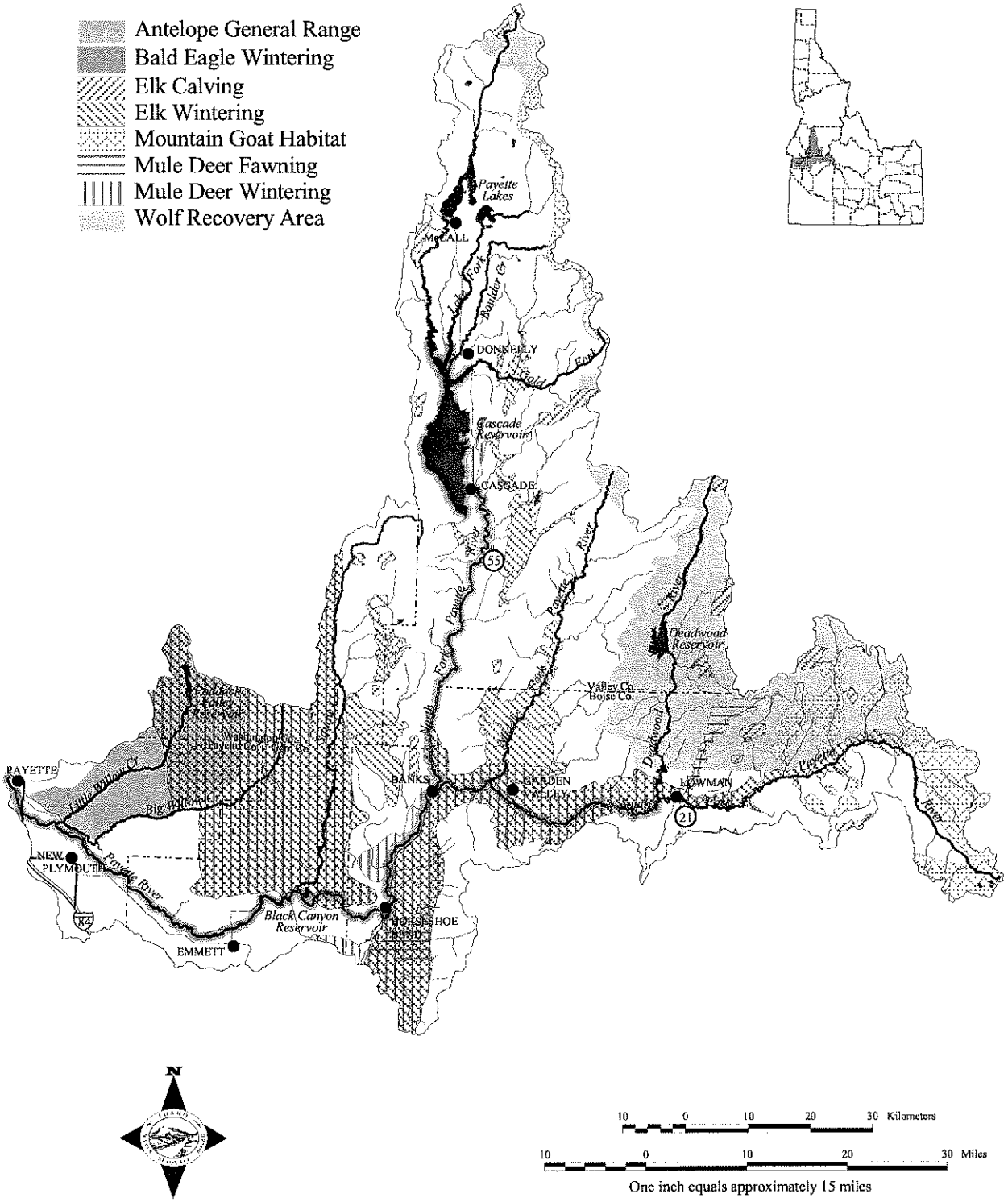
Map 19. Wildlife Habitats



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flying squirrel, ground squirrel, chipmunk, pika, hoary marmot, mouse, vole, and wood rat (Big Payette Lake Technical Advisory Committee, 1997).

Golden eagles have recently increased in the area because of an increase in open habitat created by forest fires (Brunner, 1995). Common to moderately common raptors include the red-tailed hawk, Swainson's hawk, ferruginous hawk, rough-legged hawk, kestrels, sharp-shinned hawk, and goshawks. Peregrine falcons are occasionally observed. Great horned owl, great gray owl, boreal owl, sawwhet owl, and the screech owl are all residents. Other birds found in the basin include the sandhill crane, great blue heron, sandpiper, kingfisher, pileated woodpecker, northern three-toed woodpecker, blue grouse, ruffed grouse, spruce grouse, and dippers. Neotropical migrant birds are species which migrate between temperate and tropical latitudes, and include the Hammond's flycatcher, Townsend's warbler, McGillivray's warbler, and the olive-sided flycatcher.

Long Valley is an important range for wintering and calving elk (Grunder, 1996; Map 19). Elk also winter east of Donnelly in the Gold Fork River drainage. Elk that summer on West Mountain migrate to the Weiser River basin in winter. Black bears are nomadic and usually stay in the wooded areas of West Mountain, using the North Fork Payette River as a travel corridor.

Since its construction, Cascade Reservoir has provided habitat for nesting bald eagles, osprey, waterfowl, and shorebirds (Grunder, 1996; EDAW, Inc., 1991). Common loons, curlews, and pelicans utilize the reservoir. The shallow marshes and wet meadows are critical nesting, feeding, and resting areas for waterfowl and shorebirds. For water birds migrating south in the fall, the reservoir is an important mass migration staging, resting, and congregation area. The north reservoir arms support the highest concentrations and diversity of birds, because of the variety of habitats and minimal human disturbance (EDAW, Inc., 1991). A large great blue heron rookery exists along the North Fork Payette inlet.

Osprey populations have increased since Cascade Dam was completed. More than thirty pairs of osprey nest in the reservoir area (EDAW, Inc., 1991). Downstream, six occupied osprey nests and a small great blue heron rookery of twelve nests were identified near Brush and Moores creeks in 1990. Red-tailed, rough-legged, ferruginous, marsh, and sparrow hawks, and short-eared, gray, and great horned owls also inhabit the area.

Large numbers of waterfowl appear on the reservoir during the April and May migration, including mallards, gadwalls, pintails, American widgeons, blue-winged teal, green-winged teal, cinnamon teal, and redhead ducks (U.S. Forest Service, et at., 1990). In May, western grebe, common mergansers, and Canada geese begin breeding along the shoreline. Because of the large number of migrating waterfowl that use the reservoir, several management agencies have recommended that livestock be excluded from shoreline areas to protect waterfowl nesting habitat (EDAW, Inc., 1991). Seasonal water level fluctuations also affect nesting waterfowl. Construction of potholes, offshore islands, and side channels from the reservoir have been recommended to create additional waterfowl habitat.

South Fork Payette Subbasin

Wildlife in the South Fork Payette drainage include black bear, elk, mountain lion, mule deer, beaver, otter, mink, moose, mountain goat, beaver, martin, pika, osprey, bald eagle, golden eagle, grouse, Canada geese, numerous waterfowl species,

and more than forty kinds of songbirds (Moore and Ames, 1979). Mountain goats inhabit Eightmile, Tenmile, and Warm Springs creek drainages, all tributaries to the upper South Fork Payette (Map 19, page 105). Important elk and deer winter range occurs at lower elevations near the river (Grunder, 1996; Yundt, 1996).

The Deadwood River corridor and adjacent tributaries are part of a major elk migration route (Yundt, 1996). The entire watershed provides extensive summer and fall elk habitat (U.S. Forest Service, Boise National Forest, Lowman Ranger District, 1992). Gray wolves have been reported in the area (Idaho Department of Fish and Game, Conservation Data Center, 1998).

The headwaters of the Middle Fork Payette River watershed provide habitat for black bear, elk, mule deer, mountain lion, gray wolf, beaver, otter, mink, moose, osprey, and numerous migratory songbirds (Grunder, 1996). At the lower elevations, good winter range exists for elk and deer, and the entire watershed is good summer range for both species. The Conservation Data Center of the Idaho Department of Fish and Game, has documented the presence of endangered gray wolves and peregrine falcons in the area (Idaho Department of Fish and Game, Conservation Data Center, 1998).

Main Payette Subbasin

The area upstream of Black Canyon Reservoir is elk and mule deer winter range, while the area north of the reservoir serves as important mule deer wintering and fawning habitat (Map 19, page 105). Migrating bald eagles typically winter along this entire reach of the Payette River. Upland game bird diversity is high, including pheasant, California quail, gray partridge, and mourning dove (Payette Soil and Water Conservation District, 1993).

Waterfowl are diverse and abundant in the lower Payette Valley because of aquatic habitat variety created by the presence of the river, irrigation diversions, and farm ponds. A 1984 survey found a substantial population of geese nesting and rearing broods on the river islands from Emmett to the mouth (U.S. Bureau of Reclamation, 1984). Reproductive success is affected by fluctuating river flows; low flows provide predator access to the nests, while high flows flood the islands and destroy the nests.

Willow Creek, a typical lower basin tributary, is home of the Four Mile wild horse herd (Idaho Department of Fish and Game, Conservation Data Center, 1998). The drainage also provides deer and elk winter range. Longbill curlews nest along the lower stream reaches. Antelope also utilize the habitat of Little and Willow creek drainages, as does the Southern Idaho ground squirrel, a Species of Special Concern to the Idaho Department of Fish and Game.

FEDERALLY LISTED THREATENED AND ENDANGERED SPECIES

Four species found in the basin are listed as endangered or threatened by the U.S. Fish and Wildlife Service under the authority of the Endangered Species Act -- peregrine falcon as endangered, the gray wolf as endangered, the bald eagle as threatened, and the bull trout as threatened.

Peregrine falcons are occasionally observed in the Payette Lake area (Brunner, 1995). The U.S. Fish and Wildlife Service released 39 birds (37 have since fledged young) in Scott Valley, east of Cascade, between 1982 and 1989 (Levine, 1993). Peregrines are currently seen on the northwest side of Cascade Reservoir, where the prey base is abundant and nesting sites available on the cliffs of West Mountain (Howard, 1997). However, no nests have yet been found.

The gray wolf once inhabited the upper North Fork Payette watershed, but has been extirpated. Recent wolf sitings have been reported along the Middle Fork Payette and Deadwood River drainages (Grunder, 1996; Arnold, 1984). Although sitings are reported, no breeding gray wolf populations are known to occur. The Central Idaho Wolf Recovery Area (depicted in Map 19, page 105), identified by the U.S. Fish and Wildlife Service as an area for wolf reintroduction, extends into a good portion of the Payette River Basin (Idaho Department of Fish and Game, Conservation Data Center, 1998).

Wintering bald eagle populations have been identified along the North Fork, South Fork, and main Payette rivers, and nesting sites have been recorded around Cascade Reservoir and Payette Lake (Brunner, 1995). Overall, eagle numbers have increased in the basin during the past ten to twenty years. Cascade Reservoir has the largest population of nesting eagles in the basin, first recorded in 1976 (Evans, et al., 1990). By 1990 eagles had established seven active nesting territories in the vicinity, five on the reservoir, and two on the North Fork Payette River, one above and one below Cascade Reservoir (U.S. Forest Service, et al., 1990; Evans, et al., 1990). From Cascade to Smiths Ferry, the river provides habitats for a variety of fish and waterfowl species which serve as important prey for the eagles (Grunder, 1996). Survey data from 1980 to 1995 report wintering bald eagles along the South Fork and main Payette rivers with a reported average of 8.4 adults and immature birds in the Lowman to Banks reach; an average of 4.3 between Banks and Emmett; and an average of 5.7 birds from Emmett to Payette. (Steenhof, 1995).

Bull trout are a fall spawning salmonid and the only char native to Idaho (Grunder, 1996). More than thirty non-native fish species compete with bull trout. Brown trout, brook trout, and lake trout have depressed or replaced many local bull trout populations. Brook trout are an especially important competitor, because they hybridize and have a higher reproductive potential.

In 1996 the state of Idaho initiated a Bull Trout Conservation Plan to restore and maintain bull trout populations (Batt, 1996). The plan designated 59 key watersheds statewide that are critical to the long-term persistence of regionally important bull trout populations. Five of these are in the Payette River Basin, including the Gold Fork River above the diversion, the upper portions of the South and Middle Forks of the Payette River, the Deadwood River above the dam, and the upper half of Squaw Creek (Map 20). The actual distribution of existing populations of bull trout is often patchy, and spawning and rearing habitat is restricted to increasingly isolated headwater "islands" (U.S. Forest Service and U.S. Bureau of Land Management, 1997). Historically, bull trout populations were connected throughout the Columbia River Basin, occurring throughout the Payette River Basin (Batt, 1996).

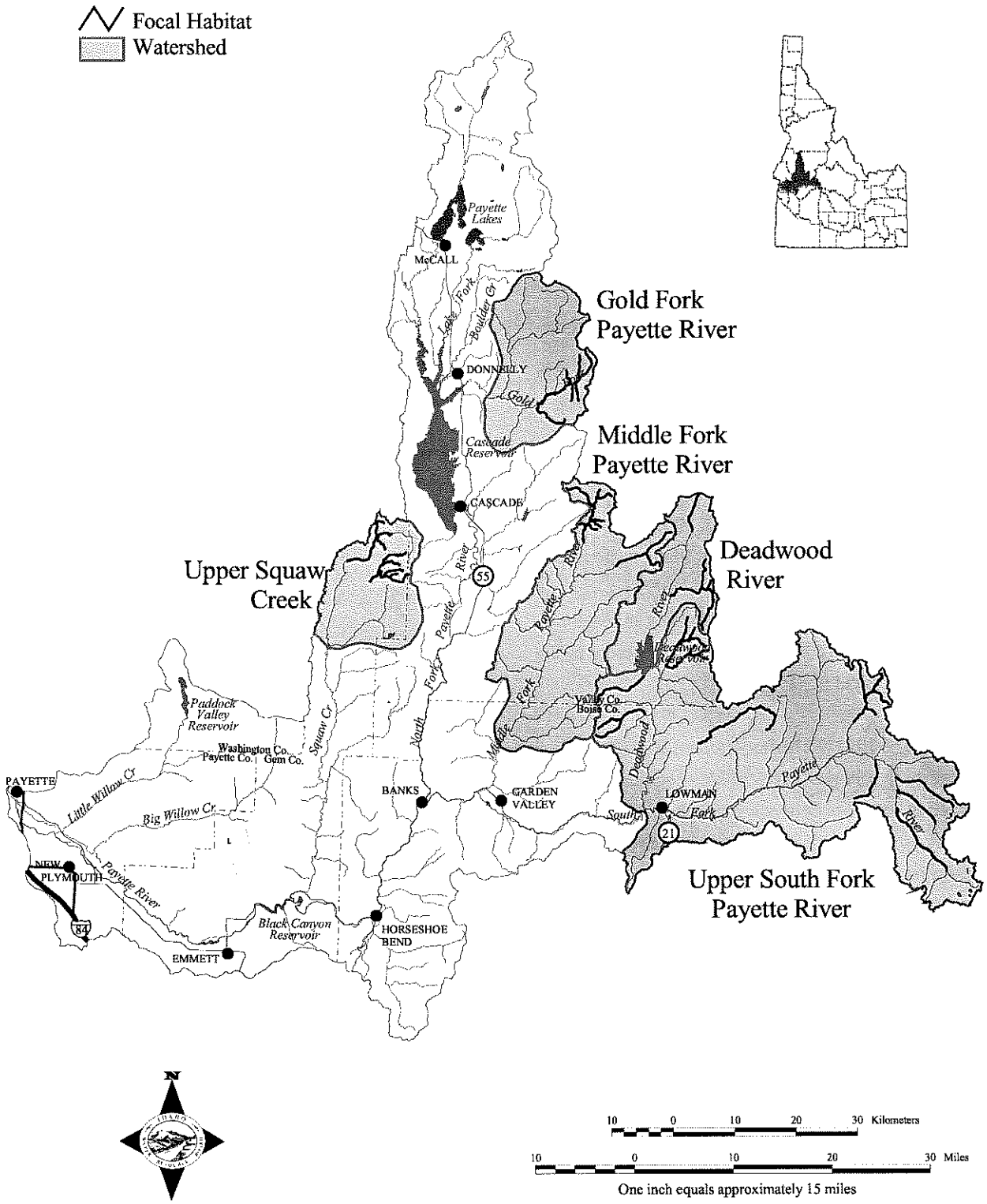
Recreation Resources

Several federal, state, county and local entities manage lands and facilities providing recreation opportunities in the basin. Based on land area, primary recreation providers are the Boise and Payette national forests, Upper Snake District Bureau of Land Management, and the U. S. Bureau of Reclamation. Additional opportunities are available at sites managed by Idaho Department of Parks and Recreation, Idaho Department of Fish and Game, and private entities.

REGIONAL RECREATION PATTERNS

The Idaho Department of Parks and Recreation divides the state into seven regions for planning purposes. The Payette River Basin located within the upper section of Region 3, encompasses the western third of Valley county, the northern half

Map 20. Bull Trout Key Watersheds



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of Boise County, most of Gem and Payette counties, and a very small portion of Washington county. See Map 21. Studies examining recreational and tourism activities in Idaho by region were conducted most recently in 1993 and 1994 -95. Pertinent results of these studies are summarized here for an understanding of the regional context of recreation patterns in the Payette River Basin.

The 1993 Nonresident Motor Vehicle Travel in Idaho study examined nonresident motorists traveling from April through November 1993 (Hunt et al., 1995). The study estimated 4.8 million individuals (23 percent of all nonresident travelers visiting Idaho) traveled in Region 3. Approximately 2.7 million of these visitors (or 56 percent) were visiting Region 3 or another location in Idaho. The primary purpose of 36 percent was to visit attractions or natural areas, or participate in specific recreation activities. Most nonresident travelers originated from Oregon, Washington, California, and Utah (Hunt et al., 1995; Figure 29). Region 3 ranked third of the seven Idaho regions for volume of nonresident traffic. Total 1993 nonresident expenditures while traveling in Region 3 were estimated at $205.8 million, or 15 percent of the state total (Hunt et al., 1995).

The 1994-95 Idaho Resident Recreation & Travel study surveyed resident household recreation and travel activities between December 1993 and January 1995 (Parrish et al., 1996). The resident survey estimated 62 percent of Region 3 residents recreated within the region and 23 percent traveled out-of-state. Residents from other Idaho regions traveling to Region 3 to recreate included 13% of Region 4 residents (South Central Idaho) and 9% of Region 7 residents (Central Idaho).

In 1994 Region 3 residents spent more than $336 million within Idaho while recreating outside their community (Parrish et al., 1996). Region 3 residents spent more for recreational pursuits than other Idaho regions. Expenditures were for traditional outdoor activities such as fishing and hunting, and restaurants, museums, or visiting out-of-town friends.

Resident and nonresident participation in Region 3 outdoor recreation activities is depicted in Figure 30 (page 112). Water-based recreation comprised 12.5 percent of nonresident motorists and 19.4 percent of residents outdoor recreation activity. Most outdoor recreation for residents consists of non-motorized land-based activities. This category includes hiking, walking, biking and picnicking, and urban-related activities such as walking around town, using greenbelts, and walking the dog. Information on winter sports was not collected in the 1994-95 nonresident study.

RECREATION OPPORTUNITIES IN THE PAYETTE RIVER BASIN

Quantification of total recreation use for the Payette River Basin is difficult using available data. Agency estimates employ different measurements for units and time periods. Much information is derived

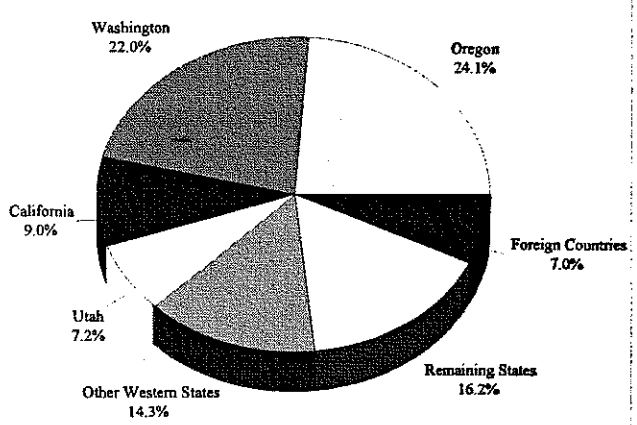
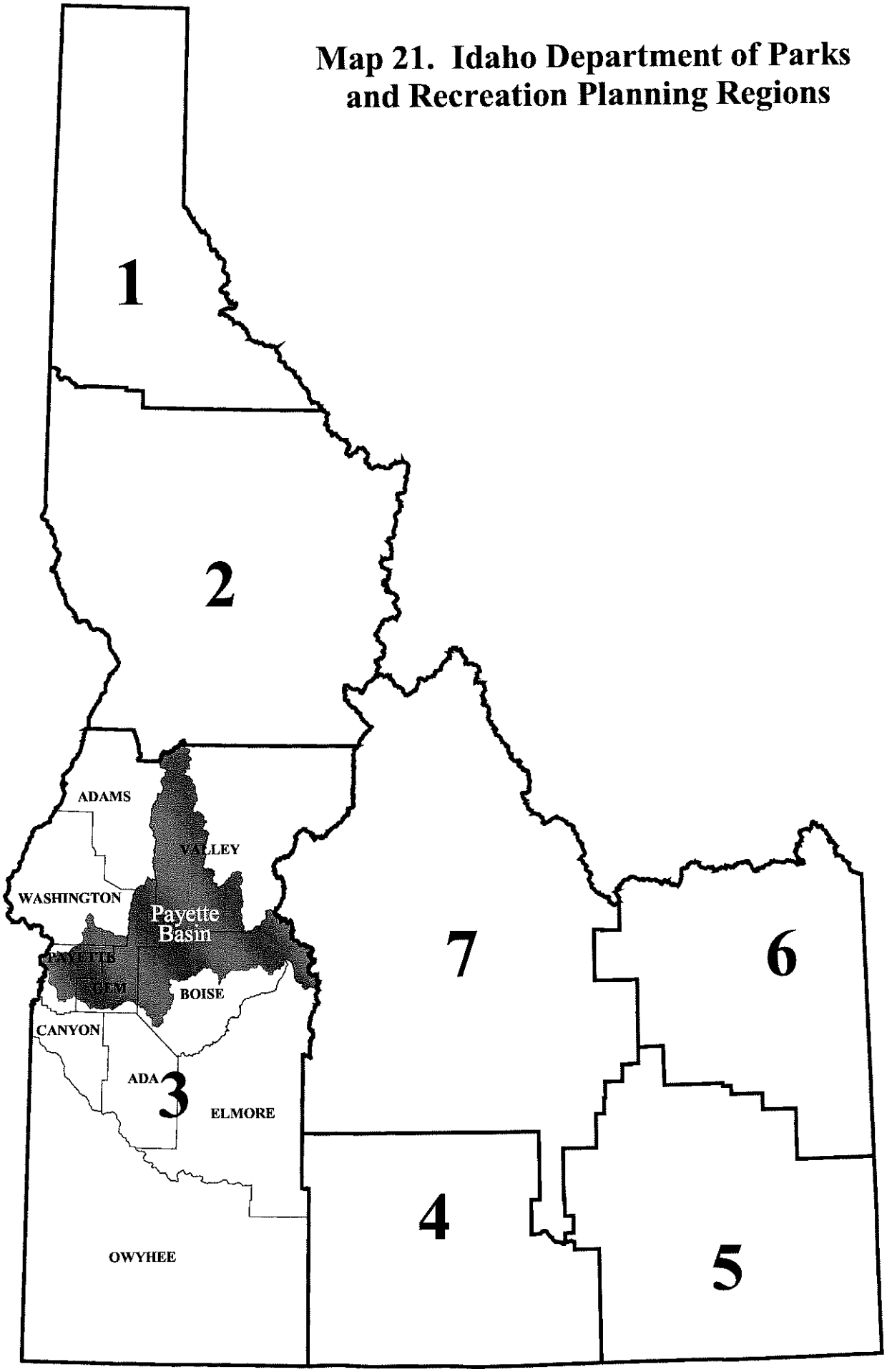


Figure 29. Origin of Nonresident Motorists Traveling Through Region 3 (Source: Hunt et al., 1995).

Map 21. Idaho Department of Parks and Recreation Planning Regions



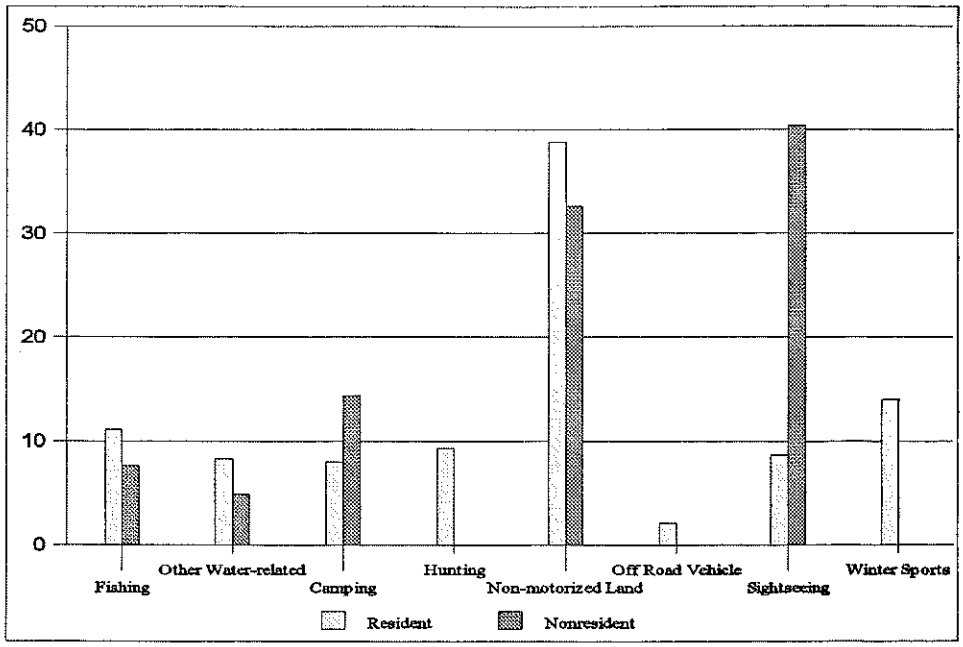


Figure 30. Percentage Estimated Outdoor Recreation Activity Participation in Region 3 (Sources: Hunt, et al., 1995; Parrish, et al., 1996).

by professional estimate as opposed to formal survey methods. Additionally, considerable activity occurs as dispersed use or through private entities which is difficult to quantify. (Dispersed use is activity that occurs outside developed facilities.) Recreation information is available for individual agencies or for isolated locations and activities within the basin.

Agency recreation estimates for lands within the Payette River Basin are displayed in Table 30. Most of this information are estimates based on professional judgment. A recreation visit is estimated for each activity that an individual participates; therefore, use estimates represent total recreation activity participation and not total numbers of individuals recreating in the basin. Information pertaining to specific areas within the basin, or for specific recreation activities, are described in the sections that follow.

Studies conducted in 1980 and 1983 provide estimates of recreation use for the North Fork and Payette rivers from Smiths Ferry to Lower Banks, South Fork Payette from Alder Creek (Garden Valley) to Banks, and the South Fork Payette from Grandjean to Alder Creek. A survey conducted in 1996 experienced sampling limitations which preclude reliable estimates of more current recreation activity in the river corridors or basin. A summary of river recreation participation by activity for the 1980 and 1983 studies is presented in Table 31.

Total hours of recreation activity almost doubled in the Smiths Ferry to Lower Banks reach from 1980 to 1983, and quadrupled in the Alder Creek to Banks reach (Reid, 1980; Idaho Power Company, 1984). Surveys of the South Fork Payette above Alder Creek to Grandjean showed significantly greater recreation use in 1980 than the downstream reach (Reid and Anderson, 1981). Most of this recreation activity occurred in or near river-oriented campgrounds, while the reach downstream of Alder Creek has limited campsites. Individuals engaged in recreation activities categorized as "other" were predominately sightseeing.

Whitewater boating activity increased substantially on both reaches between 1980 and 1983. The 1983 study found 52.2 percent of whitewater boating occurred on the South Fork Payette below

Table 30. Estimated Recreation Use in the Payette River Basin by Agency.

Agency	Time Period	Estimated Recreation Use
Idaho Department of Parks and Recreation	*1996 (Jan .1 - Dec. 31)*	Approx. 159,377 Visits
U. S. Bureau of Land Management	*FY 1996 (Oct. 1, 1995 - Sept. 30,1996)*	439,058 Visits
U. S. Bureau of Reclamation	*FY 1993 (Oct. 1, 1992 - Sept. 30,1993)*	370,503 Recreation Unit Visits
U. S. Forest Service	*FY 1996 (Oct. 1, 1995 - Sept. 30,1996)*	1,169,929 Recreation Visitor Days

Note: Idaho Department of Parks and Recreation data is for Ponderosa State Park only.
FY 1993 is the most current data available for U. S. Bureau of Reclamation.
Recreation Unit Visits or Visits = Participation by an individual in an activity regardless of length of stay.
Recreation Visitor Days = Participation in an activity for twelve hours. This could be four individuals participating in an activity for three hours each, one individual for twelve hours, or any combination equaling twelve hours.
Sources: Overton, 1997; U.S. Bureau of Land Management, 1996; Elliot, 1997; U. S. Forest Service, Boise National Forest, 1996; and Hoosick, 1997.

Table 31. Payette River Corridor Recreation Activity in 1980 and 1983 (percentages).

	North Fork and Main Payette **Smiths Ferry to Lower Banks** *(May - Oct.)*		***South Fork Payette*** **Alder Creek to Banks** *(May - Oct.)*		***South Fork Payette*** **Grandjean to Alder Creek** *(July - Oct.)*
Activity	***1980***	***1983****	***1980***	***1983****	***1980***
Camping	62.0	45.5	-	16.4	71.2
Sightseeing	19.7	*	-	*	2.4
Fishing	8.0	4.2	67.0	5.8	22.0
Whitewater boating	5.0	12.9	23.0	39.3	1.0
Picnicking	2.6	*	-	*	1.6
Horseback Riding	-	*	-	*	0.5
Swimming	-	*	-	*	0.9
Woodcutting	2.4	*	-	*	0.5
Other	0.3	37.4	10.0	38.5	-
TOTAL HOURS	**45,926**	**91,803**	**5,036**	**20,361**	**111,408**

* 1983 study compiled sightseeing, picnicking, horseback riding, swimming and woodcutting activities under the "Other" category.
Sources: Reid, 1980; Reid and Anderson, 1981; and Idaho Power Company, 1984.

Alder Creek, 44.3 percent on the Payette River below Banks, and 3.5 percent on the North Fork Payette from Smiths Ferry to Banks (Idaho Power Company, 1984). Whitewater boating activity in the Payette River basin has experienced an even greater increase since these surveys (Reid, 1997). One indicator is the increased volume of traffic on State Highway 55. Average daily traffic volumes on State Highway 55 between Porter Creek and Banks have more than doubled from 1980 to 1995 (Idaho Transportation Department, 1980 and 1995).

A summary of major recreation opportunities in the Payette River Basin are described for three sub-basins defined here as the North Fork Payette, the South Fork Payette, and the Main Payette. These descriptions include discussion of recreation opportunities along major tributaries within the sub-basins.

North Fork Payette Subbasin

The North Fork Payette drainage includes a diversity of recreational settings including high mountain lakes, forested landscapes, and broad, open

valleys. The North Fork Payette River headwaters are located north of McCall. Numerous tourism and recreation opportunities are available in the several communities located along the North Fork Payette corridor including McCall, Cascade and Donnelly. Boaters and anglers are attracted by several lakes and reservoirs that include Upper Payette, Payette and Little Payette lakes, and Cascade and Horsethief reservoirs. The lower end of the North Fork Payette is known for its whitewater boating opportunities.

Recreational activities in the headwaters area of the North Fork Payette include backpacking, hiking, horseback riding, fishing, mountain biking, and firewood cutting. A number of mountain lakes occur on tributaries to the North Fork Payette, some with special fishing restrictions providing good to excellent angling experiences. Some of the more popular mountain lakes include the Twentymile Lakes, Box, Granite, Snowslide, Louie, Boulder and Blackwell lakes. Many people hike this area to access the South Fork Salmon and main Salmon drainages.

The three Payette lakes are natural lakes that have been impounded to increase storage for irrigation needs. The most upstream is the 400 surface acre Upper Payette Lake located north of McCall. Recreation facilities surrounding the lake are managed by the Payette National Forest and consist of campgrounds, a boat launch and an interpretive trail. Fishing and camping are the main recreation activities.

Payette Lake has approximately 5,337 surface acres and 22 miles of shoreline. Private residences, including recreational homes, surround much of the lake. Only .8 miles, or 3.6 percent of the shoreline, allow public lake access (Idaho Department of Parks and Recreation, 1994). Public lake frontage includes five parks managed by the City of McCall on the southern end of Payette Lake, several with public beaches and boat ramps. The Idaho Department of Parks and Recreation manages two public beaches in Ponderosa State Park.

Ponderosa State Park is located on the southeast side of the lake, encompassing approximately 840 acres of the peninsula. The park provides campsites, day use areas for picnicking, beaches, boat ramp, nature trails and mountain biking opportunities. More than ten miles of groomed Nordic trails are available for all skill levels. Nature study and wildlife viewing opportunities are important activities. On the north end of Payette Lake the Idaho Department of Parks and Recreation manages the North Beach unit of the park, the largest public beach on the lake, encompassing an additional 630 acres. In addition to water play, jet skies and boaters launch from this area to water ski. The North Fork Payette reach upstream of Payette Lake is becoming increasingly popular for non-motorized floating. To better manage this use, Idaho Department of Parks and Recreation plans to develop this reach as a water trail with boat access and interpretive pull-outs (Hoosick, 1997).

Almost 31,000 visitors camped in the park in 1996. Camping visits have stabilized, because campground capacity has been reached during the summer season for the last six years (Hoosick, 1997). Sixty-six percent of campers are Idaho residents, with most from the Boise area (Reading and Lansing, 1996). Day use activities, such as picnicking, boating, water play, hiking, biking and skiing, grow each year, increasing 147 percent since 1990 (Table 32).

Seven organization camps located around the perimeter, and an additional five camps near the lakeshore, use facilities on the lake. A survey conducted in 1996 estimated about 37,800 to 48,600 users may participate in water activities at these camps from June through August (Spencer, 1996). Activities include swimming, boating, waterskiing, snorkeling and fishing.

Table 32. Estimated Recreation Use at Ponderosa State Park.

Activity	1990	1996
Camping	35,928 visits	30,852 visits
Day Use (includes skiing)	45,049 visits	111,442 visits
Nordic Skiing	10,745 visits *(Dec 1989 - Mar 1990)*	20,333 visits *(Dec. 1995-Mar 1996)*
North Beach Unit		*(Memorial Day to Labor Day)*
Day use		13,483 visits
Dispersed camping		3,341
Motorized boating		Approx. 400-600 crafts
Non-motorized boating		300-500 craft

Sources: Hoosick, 1997; Coyle, 1997.

Little Payette Lake is a 1,450 surface acre lake located to the southeast of Payette Lake. Fishing is the predominant recreational activity. Developed facilities are limited to a boat and float tube launches. Although no developed campground is available, camping does occur at the lake.

Downstream of Payette Lake the North Fork Payette River enters Long Valley. Lands in the valley are mainly under private ownership. National forest lands border the east and west edges of the valley. Access is available at several points along the river. The North Fork Payette downstream of Payette Lake is popular for fishing, tubing, rafting, canoeing, kayaking, and wildlife viewing. An annual kayak slalom race in this reach attracted 50 participants from the local and Boise areas in May 1997 (McClaran, 1997). Most angler activity occurs below Lardo Dam, at the McCall Fish Hatchery, Sheep Bridge, Riverfront Park and Hartsell Bridge (Gebhards, 1992; Anderson, 1997). Maintaining access to the river may become an issue with increasing development of private lands.

Cascade Reservoir is an irrigation reservoir with 86 miles of shoreline and 28,300 surface acres at full pool. Since the establishment of an administrative 300,000 acre-foot minimum pool in 1983, the mean annual drawdown is 12 feet, maintaining access for recreational use in the late summer and fall. The lowest water levels typically occur in October (EDAW, Inc., 1991).

Recreation facilities surrounding the reservoir are owned by the U. S. Bureau of Reclamation and Forest Service. These two agencies lease land to local government and private entities for recreation purposes. Beginning in 1998, the Idaho Department of Parks and Recreation is managing the U.S. Bureau of Reclamation's recreation facilities as Lake Cascade State Park through a management agreement.

The most concentrated recreation use occurs at the southeast and northwest ends of the reservoir near developed recreation facilities, and in the arms surrounded by residential development (EDAW, Inc., 1991). The most current information estimated recreation use at 299,811 recreation visits from October 1, 1992 to September 30, 1993. Estimates of recreation use demonstrated a 17.5 percent increase between 1988 and 1993 (EDAW, Inc., 1991; Overton, 1997).

The top three recreational activities associated with the reservoir are fishing, camping and motorized boating (Overton, 1997). Fishing is the primary activity. The reservoir is one of the most heavily fished waters in the state (Idaho Department of Fish and Game, 1996). Camping is a secondary use to fishing and is at 85 percent capacity during most of the season (EDAW, Inc., 1991). During holidays and many weekends the campgrounds exceed capacity. Boating activity is associated with fishing, water skiing and sightseeing. The reservoir also provides abundant wildlife viewing opportunities. Habitat is available for songbirds, shorebirds and waterfowl. Osprey and bald eagles nest near and adjacent to the reservoir.

Recreation opportunities provided by Cascade Reservoir are a significant part of the local area's economy (Mount, 1997). The Cascade Chamber of Commerce has capitalized on this by organizing several events to attract people to the area. Events include ice fishing contests, several fishing tournaments, water ski competitions, sprint boat races and a sailboat regatta (Mount, 1997).

Tributaries to Cascade Reservoir receive recreational use where public access is available. The lower reaches of Lake Fork, Boulder Creek and Gold Fork do not have much public access. Further upstream on national forest lands, camping, hunting, hiking and sightseeing are popular activities. Facilities include developed campgrounds and trails. Most use is associated with horseback riding and hunting (Ludvigsen, 1997). Backpackers use the area to access high mountain lakes in the Payette River Basin and areas in the South Fork Salmon drainage. Rock climbing is popular at Slick Rock located in the North Fork of the Lake Fork drainage.

Angling and floating are popular recreation activities below Cascade Dam. Several private campgrounds and RV parks are located adjacent or near the river. Some canoeing occurs below the dam downstream to Cabarton Bridge. Most of the land ownership is private along this reach so access is limited.

Horsethief Reservoir has 275 surface acres when full, and provides fishing, boating and camping facilities managed by the Idaho Department of Fish and Game. Recreationists are mainly from the Boise area (Hardy, 1997). The primary recreation activity is fishing. In 1994 an estimated 30,000 angler hours occurred on the reservoir from May 1 to July 30 (Turnipseed, 1997). For the same period, 7,500 tents and campers were counted.

Below Cabarton Bridge public access is available on Boise Cascade lands. This reach is considered an important angling reach, because it is relatively undisturbed by railroad and highway construction. Access is provided by a dirt road paralleling much of this reach. Whitewater boating is popular in the reach from Cabarton Bridge to Smiths Ferry.

State Highway 55, designated as the Payette River scenic byway, parallels the North Fork Payette from Banks to Smiths Ferry. Scenic byways are designated by the Idaho Transportation Board, identifying travel routes with superior aesthetic characteristics. The Smiths Ferry to Banks reach requires expert whitewater skills, and is considered by many to be the most challenging whitewater in North America (Stuebner, 1995). Motorists stop at highway pull-offs to observe kayakers and engage in angling, picnicking, and water play. Several Forest Service campgrounds are located along the river and are used for overnight and day use activities.

South Fork Payette Subbasin

The South Fork Payette headwaters are located in the Sawtooth Wilderness Area where only non-motorized, non-mechanized recreation activities are allowed. Several trails traverse the wilderness area parallel to major waterways, including the South Fork Payette River, Barron Creek and Trail Creek. Backpacking, horseback riding, hunting and fishing are the predominate recreation activities. Use estimates for 1994 along Trail Creek and the South Fork Payette River indicate that 80 percent of users access the wilderness by foot, with the remaining 20 percent riding horseback (Dean, 1997).

Grandjean, named after a former Boise National Forest supervisor, is located at the boundary of the Sawtooth Wilderness. A privately operated lodge and Forest Service campground are located here. The Grandjean resort consists of a campground, cabins and a geothermal pool. Sacajawea Hot Springs are located adjacent to the river downstream of Grandjean. Forest Service permitted summer homes are located on downstream tributaries at Wapiti, Bear, and Camp creeks.

From Grandjean to Lowman, the South Fork Payette is paralleled in most places by State Highway 21 -- the Ponderosa Pine state scenic byway. A number of developed and dispersed camping opportunities are available in this reach. (Dispersed campsites may have stone fire rings, but no other facilities.) Several developed campgrounds have natural hot springs nearby. Bonneville campground is one of these, receiving the highest use of the campgrounds located in the South Fork Payette sub-basin. Kirkham campground and hot springs, located adjacent to State Highway 21 and the South Fork Payette River, is another popular campground. Adequate flows for whitewater boating generally occur during spring runoff, usually from April through June.

The Banks-Lowman Highway, or Forest Highway 17, parallels near the South Fork Payette. Views of falls and major rapids are afforded by numerous pullouts. Whitewater boating occurs from the Deadwood River confluence downstream to Banks, generally from spring through the summer. Two developed campgrounds -- Pine Flats and Hot Springs -- offer natural hot springs nearby. Boaters floating the South Fork and main Payette rivers use these campgrounds and a number of dispersed areas. Fishing is also a popular activity along this reach. Recreational dredge mining occurs in the vicinity of Lowman and Garden Valley.

According to the U. S. Board of Geographic Names nomenclature, the Main Payette River begins at the confluence of the Middle and South forks. However, the locals refer to this reach (Middle Fork confluence to Banks) as the South Fork Payette River. This reach is best known for whitewater boating opportunities. Sightseers use Forest Highway 17 to observe boaters and to access recreation opportunities in other areas of the Payette or Salmon basins.

Deadwood River and Reservoir

The Deadwood River joins the South Fork Payette downstream from Lowman. Deadwood Reservoir is accessed by driving about 26 miles on a rough, gravel road. Despite the primitive road, the campgrounds are full most weekends, attracting recreationists because of the isolated experience (Waugh, 1997). The Forest Service has several developed campgrounds and boat access facilities around the perimeter of the reservoir. Recreation use was estimated at 5,670 recreation visits from October 1, 1992 through September 30, 1993. The three main recreational activities include fishing, motorized boating, and non-motorized boating (Overton, 1997).

Above the reservoir, the river is paralleled by a dirt road providing access to camping and fishing at dispersed sites. No developed facilities are provided in this reach. Advanced whitewater boating skills are required to float the steep, isolated canyon below Deadwood Reservoir. From the Julie Creek confluence to the South Fork confluence a dirt road parallels the river. Julie Creek is a popular area for fishing, camping, trail access and whitewater boat put-in and take-out. Six areas on the Deadwood River below Julie Creek confluence are popular dispersed campsites and fishing spots.

Middle Fork Payette and Tributaries

Most land in the Middle Fork Payette sub-basin is under the jurisdiction of the Boise National Forest. The Forest Service estimates 2,000-3,000 people recreate on national forest lands in the sub-basin on a summer weekend (Hale, 1997). Private development and the community of Crouch are located downstream of Tie Creek. Primary recreation activities are camping, hiking, soaking in hot springs, off road vehicle use, hunting and some fishing.

The upper reach from the headwaters to Boiling Springs is paralleled by a trail with numerous hot springs adjacent. This trail receives the highest use of trails in the Middle Fork Payette sub-basin (Hale, 1997). The middle reach (Boiling Springs to Tie Creek Campground) is paralleled by an unimproved road, accessing five public campgrounds. Minor whitewater boating activity occurs along this reach. The lower reach (below Tie Creek) is paralleled by private lands with rural land uses and recreational homes. Most boating use on the Middle Fork Payette occurs on this reach where Tie Creek is a popular canoe put-in.

The Terrace Lakes Resort, located north of Crouch, is a year-round resort requiring membership. Facilities include a golf course, geothermally heated pool, tennis, and restaurant. In the winter, the resort functions as a beginning point for snowmobile trips.

A major tributary to the Middle Fork Payette is Silver Creek, located in Peace Valley, which receives substantial use and provides diverse recreation activities. Camping occurs at several developed and dispersed camping sites. The trails system is popular with motorized users. The Idaho Department of Fish and Game stocks Silver Creek regularly, attracting many anglers. Silver Creek Plunge is a privately operated resort offering camping, cabins, a geothermally heated swimming pool and creek access.

Main Payette Subbasin

Landownership influences the recreation opportunities available in the Main Payette sub-basin. The main stem is predominantly under private ownership so access is limited to points along the river where public land jurisdiction occurs. The Payette River is paralleled by roads, including State Highways 55 and 52, from Banks to Black Canyon Dam.

Banks is located where the North Fork Payette joins the South Fork Payette River. The area is the center of boating activity serving as a put-in and take-out for several whitewater reaches. A store and cafe provide services to boaters and motorists driving State Highway 55 and Forest Highway 17. The Payette River from Banks to Beehive Bend is the most floated whitewater reach in the basin, because adequate flows are available year-round, convenient access is provided by the adjacent highway, developed parking areas are available at key put-ins and take-outs, and its proximity to the Boise area. The many pull-offs along State Highway 55, sandy beaches and gravel bars also invite other recreationists to picnic, water play, fish and observe boaters.

At the Horseshoe Bend Hydroelectric Project a boat bypass has been constructed at the diversion canal intake, locally known as "The Gutter". The bypass attracts beginning kayakers because of its training opportunities, and more advanced kayakers for play wave opportunities. In the past two years the Payette Whitewater Rodeo has held the freestyle competition at the bypass.

Downstream of Horseshoe Bend, Montour Wildlife/Recreation Area is managed by cooperative agreement between the U. S. Bureau of Reclamation and Idaho Department of Fish and Game. The 1100-acre site includes the townsite of Montour which experienced flooding problems after construction of Black Canyon Dam in 1924. In 1976 the U. S. Bureau of Reclamation purchased lands within the 100-year floodplain, including the townsite of Montour. Today the primary management objective for the area is to provide waterfowl and upland game habitat, game bird hunting, and other wildlife-related recreation opportunities. The top recreational activities at the wildlife recreation area are hunting and camping (Overton, 1997). Other recreation activities include fishing, wildlife viewing, hiking and photography (Shelton, 1997).

Black Canyon Reservoir, located on the Payette River between Horseshoe Bend and Emmett, is managed by the U. S. Bureau of Reclamation. Recreation use was estimated at 59,022 recreation visits for October 1, 1992 through September 30, 1993. The top three recreational activities are picnicking, water skiing, and swimming (Overton, 1997). Users are primarily from the local area.

Below Black Canyon Dam, the river is surrounded by private land with limited access. Recreation access is provided by seven Idaho Department of Fish and Game sportsman's access areas. The river is popular with fishermen, hunters, birdwatchers, and sightseers, receiving some boating activity. Letha marks the division between a mixed warmwater/coldwater fishery upstream and a warmwater fishery downstream. The Idaho Department of Fish and Game estimates recreation use at about 20,000 user days annually (Shelton, 1997).

The Idaho Department of Fish and Game also manages the Birding Island Wildlife Management Area in this reach. The wildlife management area is managed for waterfowl and upland bird game production. Recreation use is estimated at 10,000 user days annually, including anglers, hunters, picnickers, boaters, and sightseers (Turnipseed, 1997; Shelton, 1997). About half of the recreationists reside in the area and the other half originate from Boise and Nampa, with some from out-of-state (Shelton, 1997)

In the community of Payette, local residents float the river with inner tubes and rafts. Current plans are to construct a greenbelt adjacent to the Payette River to the Snake River confluence.

Squaw Creek Drainage

Squaw Creek is tributary to the Main Payette at Black Canyon Reservoir. The headwaters of the drainage are located in the Boise National Forest. Recreational activities include camping, hiking, hunting, fishing and snowmobiling. Sagehen Reservoir, with about 180 surface acres, is located on the Second Fork of Squaw Creek. The reservoir is surrounded by several public campgrounds and a boat ramp. Numerous trails in the vicinity connect with trails located in the North Fork Payette drainage. The reservoir is a popular fishery and considered one of the best for angling success in the State.

Big and Little Willow Creeks

Land in the Big Willow Creek drainage is mainly under private ownership so public recreation opportunities are more limited. The drainage receives some use from fisherman, and waterfowl and upland bird hunters. Recreation use at Paddock Valley Reservoir, located in the headwaters of Little Willow Creek, is associated with angling. The reservoir is considered one of the best bass and crappie fisheries in the state (Hardy, 1997). Although recent drought has affected the fishery, it is expected to recover. Estimated use is 10,000 angler days annually, with most anglers from the Boise area (Shelton, 1997). Hunting for deer, elk, waterfowl and upland bird also occurs. Dispersed camping is associated with this use.

DISCUSSION OF SPECIFIC RECREATION ACTIVITIES IN THE BASIN

Participation in water-based recreation activities is substantial in the Payette River Basin, and is enjoyed by basin and Boise area residents. Water-based recreation activities and recreation indirectly associated with waterways are described in the following sections. Map 22 shows boat access and the Idaho Department of Fish and Game's sportsman's access areas, providing access for water-based recreation.

Boating

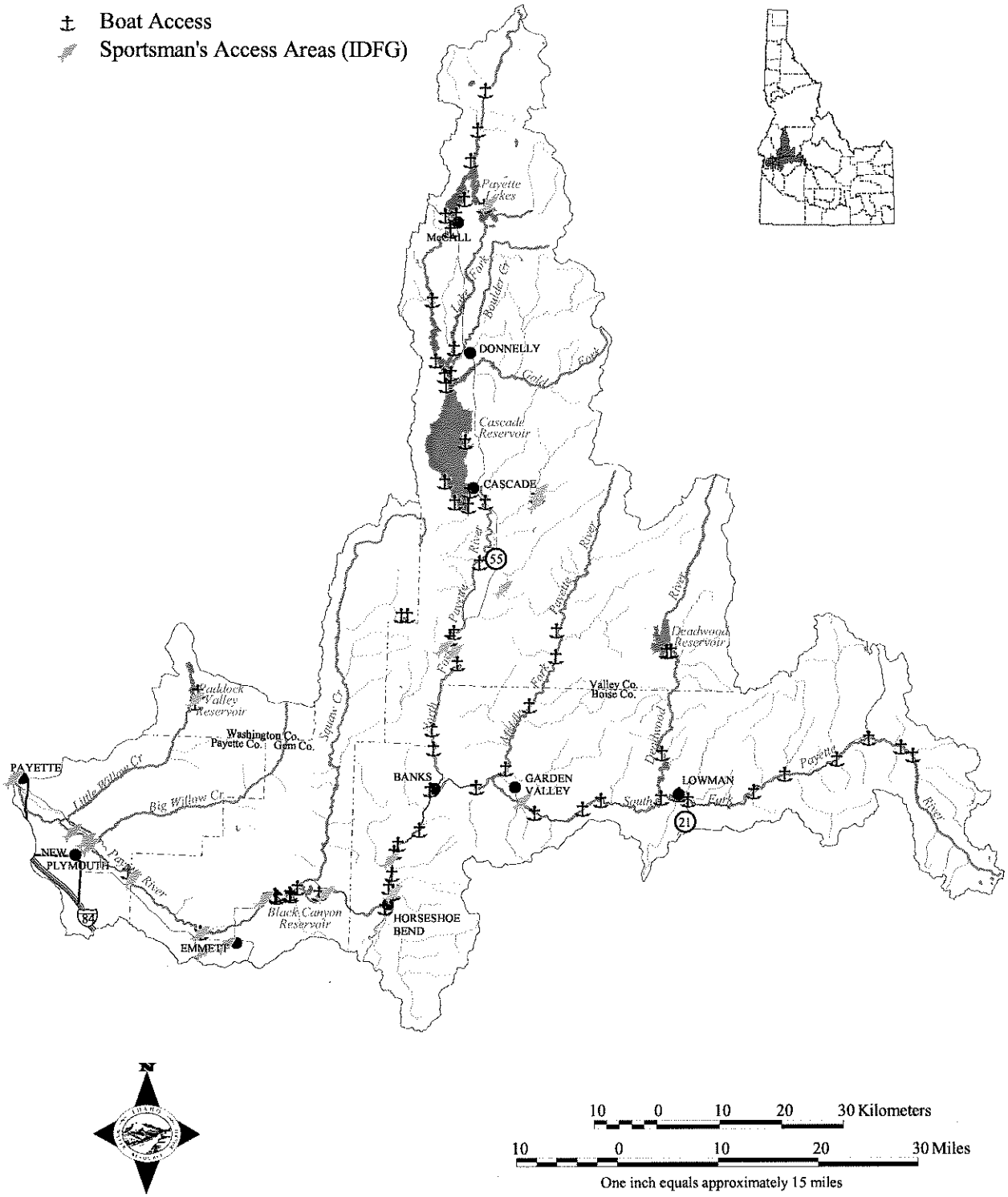
The basin possesses about 60,000 surface acres of boatable rivers, lakes and reservoirs, comprising 9.1 percent of the state total (Murphey, 1996). Over 80,000 motor boats and sailboats were registered in Idaho in 1996, a 25 percent increase from 1990 (Hiatt, 1997). Boat owners can designate primary and secondary counties of use during the registration process. Approximately 9 percent of registered boaters in Idaho selected counties in the Payette River Basin as their primary destination. Valley County was ranked fourth in the state which includes the Payette lakes, Cascade Reservoir, Deadwood Reservoir and the Payette River. Boaters designating Valley County as their primary/secondary use area have increased 8.5 percent annually from 1988 through 1991 (Idaho Department of Parks and Recreation, 1994). Increased boating activity and dramatic increases in personal watercraft (jet skies) are leading to reported conflicts among recreation users on Cascade Reservoir and Payette Lake (Helms, 1997).

Lakes and Reservoirs

Payette Lake is considered one of the premiere boating lakes in southwestern Idaho, because of its scenic setting, proximity to Idaho's major population base, accessibility, and the amenities offered in the City of McCall (Idaho Department of Parks and Recreation, 1994). Currently only three public ramps exist around the lake -- one each at Ponderosa State Park's Peninsula and North Beach units, and one at the City of McCall's Legacy Park. Physical carrying capacity of the lake is estimated at 305 boats at one time (Idaho Department of Parks and Recreation, 1994).

Motor boats are the predominate boating activity on Payette Lake (Big Payette Lake Technical Advisory Committee, 1997). A boating recreation and creel survey conducted on Payette Lake estimated 36,558 hours of boating activity from July 1995 through June 1996. Figure 31 (page 122) depicts the type of boating use. Motor boat use is largely associated with general sightseeing and transportation. Most boating occurs in the months of July through September. Marine Sargent reports indicate that crowding and reckless operation are a major concern (Helms, 1997). In 1997 seven accidents were reported, including two fatalities (Helms, 1997). This is slightly higher than the average reported over the past four years.

Map 22. Recreation Access



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Cascade Reservoir is the largest waterbody in the basin, with thirteen sites providing boat access. According to the 1991 Cascade Reservoir Resource Management Plan, 150 to 200 boats are on the reservoir at one time during weekends, and as many as 250 boats during holidays (EDAW Inc., 1991). Estimated low density physical carrying capacity is 2,177 boats at one time with full pool, and 1,300 boats at low pool. However, the configuration of the reservoir and location of recreation facilities limit carrying capacity for portions of the reservoir. Physical carrying capacity at the northern arm is more limited, because of the narrowness of the reservoir. Most waterskiing and boating occurs in this area. The Boulder Creek arm experiences high density use due to the numerous homes along the shoreline. Three accidents, including one fatality, were reported on the reservoir in 1997 (Helms, 1997). This is an increase from previous years.

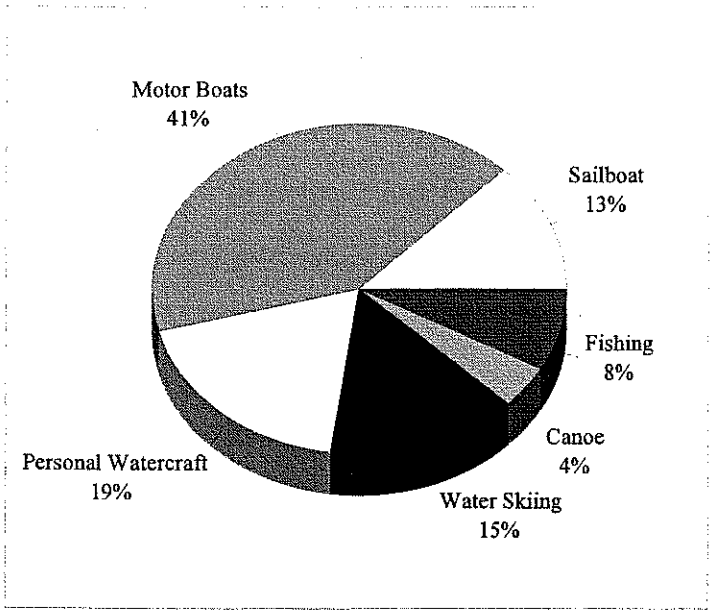

Figure 31. Boat Types Using Payette Lake (Source: Big Payette Lake Technical Advisory Committee, 1997).

Rivers

Whitewater boating opportunities in the basin are diverse in terms of boating difficulty, landscape settings and quality of experience. Close proximity to the Boise area, easy access to a number of river reaches, and developed boat access facilities make whitewater boating a significant attraction to boaters from the Boise area. The boating opportunities also attract people nationally. A survey conducted in 1989 (the most recent survey data available), found 27 percent of boaters on the Payette River, 52 percent of boaters on the North Fork Payette, and 30 percent of boaters on the South Fork Payette were from out-of-state (Idaho Department of Parks and Recreation, 1989). At least 44 percent of commercial boating clientele were nonresidents (Table 36, page 126).

Table 33 demonstrates the diversity of floating opportunities identified in the basin, comprising more than 200 river miles. The information in this table reflects the relative difficulty, and minimum and maximum flow levels required for the majority of boaters. Difficulty and skills required can vary significantly, depending on the river flows, equipment and boater experience. At maximum flow levels most of the Payette River reaches require advanced and/or expert boating skills. An optimum flow for most reaches is 1,500 cfs (Loveland, 1997). Landslides occurring adjacent to the South Fork and main Payette in 1997 altered the river channel, changing the boating difficulty of some reaches.

A number of nationally-recognized whitewater competitions occur in the basin regularly, attesting to the national significance of boating opportunities. Many consider the variety and quality of whitewater to provide excellent training opportunities for future Olympic kayak contenders (Beck, 1997). The Payette Whitewater Roundup takes place on the main Payette the weekend following the Fourth of July, occurring for a three-day period. The event attracted 123 participants in 1997 (Beck, 1997). The majority originated from Idaho (62 individuals) with an additional 51 individuals from other western states, individuals from eastern states, and 2 individuals journeyed from outside the country. An estimated 400-600 spectators come to watch the activity.

Table 33. River Boating Opportunities in the Payette River Basin.

Put-in/Take-out	Min. Flow (cfs)	Max. Flow (cfs)	Class*/Skill Level
North Fork Payette			
Below Upper Payette Lake to Fisher Ck.	800	3,000	IV / Adv. Intermediate
Fisher Creek to North Beach	800	N/A	I / Beginner
Rotary Park to Sheep Creek Bridge	800	N/A	II / Beginner *(One class II)*
Sheep Creek Br to Hartsell Bridge	800	2,000	Intermediate
Cascade Bridge (south side of town) to Cabarton Bridge	800	N/A	I / Beginner
Cabarton Bridge to Smiths Ferry	800	4,000	III / Intermediate
Smiths Ferry to Banks	800	2,500	V / Expert *(Above 2,000 cfs - V+; above 4,000 -VI)*
South Fork Payette			
Sacajawea Hot Springs to Mountainview Campground	600	5,000	IV / Advanced *(Above 3,000 - IV+)*
Deadwood River to Danskin Station (Canyon section)	600	3,000	IV / Advanced *(Above 3,000 - IV+)*
Danskin Station to Alder Creek (Swirly Canyon)	600	3,000	III / Adv. Intermediate *(Above 3,000 - IV)*
Alder Creek to Deer Creek	800	N/A	II / Beginner
Deer Creek to Banks (Staircase)	600	4,000	III-IV+ / Intermediate - Advanced *(Above 4,000 Advanced / IV+)*
Deadwood			
Deadwood Dam to Julie Ck Campground	800	3,000	IV-V / Expert *(Because of remoteness)*
Julie Ck Campground to South Fk Payette	800	3,000	IV / Advanced
Middle Fork Payette			
West Fork Bridge to Trail Creek	600	2,500	IV / Adv. Intermediate
Tie Creek Campground to Crouch	600	2,500	II / Beginner
Main Payette			
Banks to Beehive Bend	800	10,000	III / Adv. Beginner *(Advanced above 10,000)*
Beehive Bend to Horseshoe Bend Br.	800	N/A	III / Beginner *(One class IV rapid above 8-10,000)*
Horseshoe Bend Bridge to Montour	800	N/A	I-II / Beginner
Montour Br to backwaters Black Canyon	800	N/A	I / Beginner
Black Canyon Dam to Letha Bridge	800	N/A	I / Adv. Beginner *(Diversion dams to watch)*
Letha Bridge to Payette mouth	800	N/A	Advanced Beginner *(Diversion dams to watch)*

* Based on the international scale of difficulty with Class I being the easiest and Class VI being extremely difficult.

N/A = Not available

Sources: Amaral, 1990; McClaran and Moore, 1989; Stuebner, 1995; and Loveland, 1997.

A competition organized by the U. S. Canoe and Kayak Team for nationally ranked Junior (18 years old and under), Senior (30 to 40 years old), and Masters (over 40 years old) boaters occurs approximately every other year on the Payette River system. In 1997 the competition took place on the North Fork Payette River. The competition attracted 64 competitors with 15 individuals originating from Idaho, 27 individuals from other western states, and 22 from eastern states (Beck, 1997).

Use estimates for recreational whitewater boating activity on the North Fork, South Fork and main Payette rivers are reported in Table 34. Trends are difficult to discern because documented boating use has been reported using different units (hours versus boaters), and for different reaches. Recreation managers believe boating activity has increased significantly since these surveys. Accurate quantification of current boating activity on these reaches has been difficult because of budget limitations and low compliance at registration boxes.

Indicators of significant increases in whitewater boating in the basin include growth in area boating equipment sales and rentals, increased traffic volumes on State Highway 55, and higher densities at public access facilities. Raft and kayak rentals have increased at least 10 to 15 percent annually over the last fifteen years for area businesses, with some experiencing a doubling of business in the early 1990s (Darr, 1997; Kolby, 1997). Local raft manufacturing companies have experienced yearly sales growth in the range of 15 to 30 percent over the last three to five years (Tims, 1997). A notable trend is the increase in boating equipment purchases by private individuals compared to sales primarily to commercial outfitters ten to fifteen years ago. Growth is attributed to population increases in the Boise region, changes in boating technology, and the increased popularity of paddle sports nationally. Most boating activity occurs from May to September. With adequate flows and favorable weather, boating may continue into October. Although most floating occurs on weekends, weekday activity is greater than

Table 34. Estimated Whitewater Boating Activity in the Payette River Basin.

River Reach	1980 *(May 24-Oct 10)*	1983	1989 *(May 29-Sept 10)*
North Fork Payette Cabarton to Smiths Ferry Smiths Ferry to Banks Smiths Ferry to Lower Banks	2,483 hours	5,096 hours *(May 28-Sept 5)** 544 hours *(May 24-Oct 10)*	2,154 hours
South Fork Payette Grandjean to Alder Creek Bridge Alder Creek Bridge to Banks Deadwood River to Banks Deer Creek to Banks	516 hrs. *(Jul 19-Oct 10)* 1,224 hours	8,002 hours *(May 24-Oct 10)* 16,584 hours±15,576 *(May 28-Sept 5)**	31,542 hours*
Main Payette Banks to Gardena		6,795 hours *(May 24-Oct 10)* 19,948 hours±10,760 *(May 28-Sept5)**	32,252 hours*

* Study originally documented boating use as number of boaters. This was converted to hours to allow comparison with earlier studies.
Sources: Reid, 1980; Reid and Anderson, 1981; McLaughlin and Feldman, 1983; Idaho Power Company, 1984; and Idaho Department of Parks and Recreation, 1989.

would typically be expected. Many people are able to float the Payette after work during the summer, because of the basin's proximity to Boise and the long daylight hours.

Commercial Outfitting

The Idaho Outfitters and Guides Licensing Board regulates the commercial boating industry, determining the maximum number of outfitters allowed per river reach or lake/reservoir [IDAPA 25 Title 01 Chapter 59]. Table 35 lists the number of licensed outfitters operating on rivers and reservoirs in the basin. Commercial outfitting is not permitted on Payette River basin waterways not listed in this table.

Based on numbers of guests, trips on the main Payette River from Banks to Beehive Bend and the Staircase reach (Deer Creek to Banks) are most popular (Long, 1997; Fisher, 1997; Fourney, 1997: See Table 36). Other popular commercial reaches are the South Fork Payette from Deadwood to Danskin (known as the South Fork Canyon), North Fork Payette from Cabarton Bridge to Smiths Ferry, and Grandjean reach of South Fork Payette.

Commercial boating trips have increased almost 79 percent from 1992 to 1996 (See Table 36). Fluctuations in client numbers reflect ownership changes for some businesses, requiring establishment of new clientele. Additionally, outfitting opportunities are controlled by weather conditions, spring runoff, and releases from Cascade and Deadwood reservoirs. The commercial season generally extends from May to September on most reaches. Table 37 lists maximum and minimum optimal flows required to offer commercially marketable trips. Gross revenues for commercial whitewater boating trips in the basin is estimated to be at least $1.3 million annually (Long, 1998).

Fishing

Topographic variation in the basin supports a variety of fish habitats and angling opportunities. Management objectives instituted by the Idaho Department of Fish and Game in its Fisheries Management Plan direct angling opportunities for specific waterways (Idaho Department of Fish and Game, 1996). Fisheries management objectives within the basin include preservation, trophy trout, wild trout, put-and-take, or general management.

Table 35. Licensed Boating Outfitters Currently Operating in the Payette River Basin.

Waterbody	Maximum Allowed	Outfitters' Operating
North Fork Payette River		
Payette Lake	2	2
Little Payette Lake	2	1
Big Payette Lake Outlet to Hartsell Bridge	2	2
Cascade Reservoir	2	2
Cascade City Park to Cabarton Bridge	2	2
Cabarton Bridge to Smiths Ferry	5	5
South Fork Payette River		
Grandjean to Deadwood River	5	4
Deadwood River to Banks	5	5
Deadwood Reservoir	2	1
Main Payette River		
Banks to Black Canyon dam	5	5

Table 36. Commercial Boating Activity: Number of People Using the Services of an Outfitter from 1992-1996.

	1992		1993		1994		1995		1996	
Reach	**Res**	**NR**[1]	**Res**	**NR**	**Res**	**NR**	**Res**	**NR**	**Res**	**NR**
North Fork Payette										
Payette Lakes Outlet to Hartsell Br.	41	17	34	4	5	53	20	12	29	10
Cascade City Park to Cabarton	—	—	10	2	8	0	4	12	3	6
Cabarton to Smiths Ferry	889	443	632	489	588	344	230	325	837	277
South Fork Payette										
Grandjean to Deadwood	86	329	56	128	12	52	50	363	235	340
Deadwood to Banks	1,678	1,483	2,376	1,916	1,697	1,520	3,023	3,596	3,775	1,809
Main Payette										
Banks to Black Canyon	811	532	1,077	1,078	1,281	1,005	1,430	2,565	2,675	1,281
Resident/Nonresident Totals	***3,505***	***2,804***	***4,185***	***3,617***	***3,591***	***2,974***	***4,757***	***6,873***	***7,554***	***3,723***
TOTAL CLIENTS	**6,309**		**7,802**		**6,565**		**11,630**		**11,277**	

[1] Res = Resident; NR = Non-residents

Source: Idaho Outfitters and Guides Licensing Board, 1993 and 1997.

Table 37. Maximum and Minimum Flows for Commercial Float Trips in the Payette River Basin

Reach	**Maximum (cubic feet per second)**	**Minimum (cubic feet per second)**
North Fork Payette		
Cabarton Bridge to Smiths Ferry	6,000	900
South Fork Payette		
Grandjean - Grandjean to Deadwood confluence	Not available	600-700
Canyon - Deadwood R. confluence to Danskin Station	3,500-5,000	700 - 1,000
Staircase - Deer Creek to Banks	10,000	700-1,000
Main Payette		
Banks	14 ,000-15,000	Not available

Source: Fisher, 1997; Fourney, 1997; and Long, 1997.

Preservation management prohibits harvest to rebuild wild populations. Bull trout are managed for preservation in the basin. Bull trout harvest was prohibited in most of Idaho in 1994, and extended to the remainder of the state in 1996.

Trophy trout management involves increasing the catch rate and size of trout through special regulation. This management objective focuses on streams with good productivity and growth potential.

Wild trout management relies on natural production to provide angling opportunities in a waterway. A two fish bag limit is instituted for waterways with moderate to light angling pressure.

Put-and-take management objectives involve intensive stocking of catchable size hatchery rainbow trout to provide high consumptive rates. A six fish bag limit is applied on waterways with moderate to high fishing pressures and good access.

General management occurs for waterways that are not suitable for wild trout or put-and-take management. No special regulations are established.

Tables 38 and 39 list fishery management objectives and game species present for river/stream reaches, lakes and reservoirs in the basin. The Idaho Department of Fish and Game manages fishing opportunities for about 26,000 miles of trout streams and rivers, and 202 lakes and reservoirs in Idaho (Idaho Department of Fish and Game, 1997). Only 16 lakes or reservoirs in the state are managed for a trophy or quality trout experience; five of these occur in the Payette River Basin (See Table 39, page 129).

Over 418,000 Idaho fishing licenses were purchased statewide in 1996. About 38 percent were nonresident licenses (Idaho Department of Fish and Game, 1997). Within Region 3, almost 139,000 fishing licenses were purchased, comprising one-third of statewide license sales. Of these, almost 22 percent were nonresident licenses. Although all purchasers may not reside or fish in the vicinity of license purchase, there is likely some relationship.

A random survey of 1029 resident and nonresident anglers who purchased a 1994 fishing license was conducted in 1995. Anglers identified Cascade Reservoir as one of the top waters fished in Idaho, and it is considered one of the most heavily fished waters in the state (Idaho Department of Fish and Game, 1995; Idaho Department of Fish and Game, 1996). In a 1987 survey asking anglers to identify their most frequently fished water, 11.5 percent of Region 3 residents named Cascade Reservoir (Reid, 1989). Nonresident anglers named the Payette River (1.7 percent) and Cascade Reservoir (1.2 percent) as most frequently fished waters, ranking these waterbodies in the top twenty fishing waters of Idaho.

Creel census surveys have been completed for some reservoirs, lakes and river reaches in the Payette River basin. Most available information has focused on the reservoirs and lakes in the basin, providing enough information to document trends in angling activity. Table 40 (page 130) reports studies conducted on reservoirs and lakes in the basins. Table 41 (page 131) summarizes creel census data for river reaches.

Payette Lake anglers spent an estimated 11,849 hours from May 1995 to July 1996. Most of the fishing pressure during this period (95 percent) were from boat anglers. The remaining 5 percent were comprised of shore anglers (3.6 percent) or ice fishing (1.4 percent) (Big Payette Lake Technical Advisory Committee, 1997). Angler pressure has declined since 1986 (Table 40).

Kokanee comprised the majority of the harvest (69 percent) during the 1995-96 season, followed by rainbow trout (13 percent), lake trout (6 percent), and cutthroat trout (3 percent) (Big Payette Lake Technical Advisory Committee, 1997). Payette Lake is gaining popularity as a lake trout fishery, and is managed as a trophy fishery for this species. In 1996 harvest regulations were implemented to improve the quality of the angling experience by increasing the size of lake trout. Fishing for lake trout is considered excellent compared to lakes around the nation (Big Payette Lake Technical Advisory Committee, 1997). Cutthroat trout within

Table 38. Idaho Department of Fish and Game Fisheries Management Objectives for Rivers/Streams in the Basin.

Reach	Management Objective	Species Present
North Fork Payette		
Headwaters to Payette Lake, including tributaries	Preservation	bull trout
	Wild trout	Pennask rainbow trout, cutthroat trout
	Put-and-take	mountain whitefish, rainbow trout, brook trout, kokanee
Below Payette Lake to Cascade Reservoir	Put-and-take	rainbow trout, brook trout, mountain whitefish, brown trout, kokanee
Cascade Dam to Smiths Ferry, including tributaries	General	yellow perch, brown trout, mountain whitefish, bullhead,
	Wild trout	rainbow trout
Smiths Ferry to Banks	Wild trout	rainbow trout
		mountain whitefish
Lake Fork Creek		
Headwaters to Brown's Pond Outlet	Put-and-take	rainbow trout, brook trout
Brown's Pond Outlet to Little Payette Lake	Trophy	rainbow trout
		kokanee salmon
Below Little Payette Lake, includes tributaries	General	rainbow trout, kokanee salmon, coho salmon, brook trout
Boulder Creek and tributaries	Put-and-take	rainbow trout, brook trout
Gold Fork Creek and tributaries	Put-and-take	rainbow trout, brook trout, kokanee salmon, coho salmon,
	Preservation	bull trout
Clear Creek	Preservation	bull trout
	General	rainbow trout, mountain whitefish
South Fork Payette		
Headwaters to Middle Fork and tributaries	Preservation	bull trout
Headwaters to Tenmile Bridge including tributaries	Wild trout	rainbow trout
	Preservation	bull trout
		cutthroat trout, brook trout, mountain whitefish
Tenmile Bridge to Deadwood Bridge and tributaries	Put-and-take	cutthroat trout, brook trout, mountain whitefish, rainbow trout
Deadwood River confluence to Middle Fork	Wild trout	rainbow trout
		mountain whitefish, cutthroat trout
Deadwood River		
Deadwood Dam to mouth and tributaries	Preservation	bull trout
	Wild trout	rainbow trout
		mountain whitefish
Middle Fork Payette		
Headwaters to Silver Creek	Preservation	bull trout,
	Wild trout	rainbow trout
		cutthroat trout, mountain whitefish, brook trout
Silver Creek to mouth	Preservation	bull trout
	Put-and-take	rainbow trout, cutthroat trout, mountain whitefish, brook trout
Silver Creek		
Headwaters to Silver Creek Plunge	Preservation	bull trout
	Wild trout	rainbow trout
		brook trout, cutthroat trout, mountain whitefish
Silver Creek Plunge to mouth	Preservation	bull trout
	Put-and-take	rainbow trout, cutthroat trout, mountain whitefish
Main Payette		
Middle Fork to Black Canyon Reservoir	Preservation	bull trout
	Wild trout	rainbow trout
		mountain whitefish, cutthroat trout
Black Canyon Dam to mouth	General	smallmouth bass, channel catfish, largemouth bass, black crappie, flathead catfish, bullhead, bluegill, yellow perch, pumpkinseed, mountain whitefish, rainbow trout, brown trout
Squaw and Willow Creeks	Wild trout	rainbow trout
	General	bullhead, catfish

Source: Idaho Department of Fish and Game, 1996.

Table 39. Idaho Department of Fish and Game Fisheries Management Objectives for Basin Lakes/ Reservoirs.

Lake/Reservoir	Management	Species Present
Upper Payette Lake	General	rainbow trout, brook trout, splake
Payette Lake	General Trophy	rainbow trout, cutthroat trout, kokanee salmon lake trout
Blackwell Lake	Trophy	rainbow trout
Little Payette Lake	Trophy	rainbow trout smallmouth bass, kokanee salmon
Brush and Louie Lakes	Trophy	rainbow trout cutthroat trout, rainbow x cutthroat hybrids
All other alpine lakes	General	rainbow trout, Arctic grayling, brook trout, cutthroat trout, brown trout, rainbow x cutthroat hybrids
Cascade Reservoir	General	rainbow trout, kokanee salmon, coho salmon, yellow perch, channel catfish, black crappie, smallmouth bass
Horsethief Reservoir	General	rainbow trout, rainbow x cutthroat hybrids, brook trout, brown trout, yellow perch, splake
Bull Trout Lake	General	brook trout, rainbow trout, kokanee salmon, Atlantic salmon
Deadwood Reservoir	Preservation General	bull trout kokanee salmon, cutthroat, rainbow trout, fall chinook salmon, brook trout, mountain whitefish
Sagehen Reservoir	Put-and-take	rainbow trout
Emmett, Airport & Star Lane Ponds	General	largemouth bass, bullhead, bluegill, pumpkinseed, channel catfish, rainbow trout
Black Canyon Reservoir	General	largemouth bass, black crappie, bullhead, bluegill, channel catfish
Paddock Reservoir	General	largemouth bass, black crappie, bullhead, bluegill

Source: Idaho Department of Fish and Game, 1996.

the lake provide bank anglers better opportunities to catch fish. Both kokanee and lake trout reside in deep open waters within the lake not accessible to anglers limited to shore access. Cutthroat reside in shallow shore areas, providing greater opportunities to bank anglers and owners with smaller boats.

Table 40 depicts angling trends for Cascade Reservoir in terms of angler effort and catch rates since 1969. Angler effort has varied, peaking at 414,000 in 1982. Effort is predominately a reflection of the quality of the fishery and harvest success (Janssen, 1997). Anglers stop fishing Cascade Reservoir when success is low. The primary species anglers seek are yellow perch, rainbow trout, and landlocked coho salmon. The state record coho at 5 lb. 8 oz. was caught in Cascade Reservoir in 1992. Angling effort decreased significantly in 1992, reflecting a natural downturn in the yellow perch population (Janssen and Anderson, 1994). Trout

Table 40. Angler Hours and Catch Rates for Reservoirs and Lakes in the Payette River Basin.

Lake/Reservoir	Year	Angler Hours	Catch Rate (fish/hour)	Study Period
Upper Payette Lake	1971	7,725	0.81	May 29 - Sept. 3
	1972	5,795	1.14	May 27 - Sept. 8
	1988	15,803	0.70	June - Sept.
Payette Lake	1971	17,618	0.68	May 29 - Sept. 3
	1972	16,934	0.74	May 27 - Sept. 8
	1987	13,114	0.31	May - Oct.
	1988	27,754	0.27	May - Oct.
	1995	8,333	0.13	April 30 - Nov. 1
	1996	3,516	0.07	Jan. 19 - July 4
Little Payette Lake	1987	943	0.05	June - Sept.
	1990	9,142	0.39	June - Sept.
Cascade Reservoir	1969	66,694	0.89	April 19 - Oct. 31
	1982	414,287	n/a	Dec. 26, 1981 - April 23, 1982
	1986	391,780	1.60	April 1986 - May 1987
	1991	251,052	0.33	Dec. 1990 - Nov. 1991
	1992	383,242	0.70	Dec. 1991 - Nov. 1992
Horsethief Reservoir	1978	61,235	0.38	May 26 - Aug. 26
	1994	30,000	n/a	n/a
Sagehen Reservoir	1994	27,876	0.64	June 1 - Oct. 2
Paddock Reservoir	1987	57,153	1.89	April 4 - Sept. 18

Sources: Irizarry, 1970; Reid, 1979; Reininger, et al., 1983; Anderson, et al., 1987; Mabbott and Holubetz, 1989; Scully and Anderson, 1989; Grunder, et al., 1990; Janssen and Anderson, 1992; Janssen and Anderson, 1994; Janssen, et al, 1994a; Allen, et al., 1995b; Big Payette Lake Technical Advisory Committee, 1997; and Turnipseed, 1997.

populations did not survive well under water quality conditions in the reservoir and therefore, comprised a small percentage of fish harvest. Public opinion indicates that opportunities to catch rainbow trout at the reservoir is an important opportunity to anglers.

In 1992 shore anglers accounted for 60 percent of angling effort and 53 percent of the harvest, boat anglers accounted for 19 percent of effort and 12 percent of harvest, and ice anglers 21 percent of effort and 35 percent of harvest (Janssen, et al., 1994a). Increased fishing pressure between 1991 and 1992 is attributed to an increase in yellow perch catch rates (Janssen, et al, 1994a). However, angler hours were less than those expended in 1982 and 1986.

Fishing opportunities at alpine lakes are an important angling experience in the basin. Alpine lakes received the highest approval rating among anglers in the 1987 survey compared to satisfaction ratings for trout fishing in streams, rivers, lakes and reservoirs.(Reid, 1989). The Idaho Department of Fish and Game stocks 90 alpine lakes in the basin (Idaho Department of Fish and Game, 1996). Some have self-sustaining populations. Popular lakes in the basin include Blackwell, Louie and Brush lakes managed as trophy fisheries. Pearl Lake, Box Lake and Twenty-mile Lakes also attract much use.

The Payette River basin possesses numerous quality lake and reservoir angling opportunities, but stream opportunities are more limited (Anderson,

1997). For this reason, although not renowned as "blue ribbon trophy" fisheries, several reaches provide important angling opportunities (Anderson, 1997). The North Fork Payette below Payette Lake and Cascade Reservoir provide opportunities to area residents. The Cabarton reach provides an isolated walk-in stream fishery for wild rainbow trout close to Boise and McCall. Easy access provided by campgrounds and highway pull-offs below Smiths Ferry attract anglers as well. Wild trout opportunities on reaches of the South Fork Payette, Middle Fork Payette, main Payette, Squaw Creek and Willow Creek provide important angling opportunities.

Very few creel census surveys have been conducted on rivers and streams in the Payette River basin. The limited available data is reported in Table 41. Creel census surveys conducted in 1980 on reaches of the North Fork and South Fork, found angling pressure was greatest on the South Fork Payette above Alder Creek Bridge (Reid and Anderson, 1981; Reid, 1980). A 1992 survey of angler activity on the South Fork Payette from Grandjean campground to Deadwood River found most angling hours, almost 59 percent of total effort, occurred on the lower reach (Eightmile Creek to the Deadwood River confluence) (Elle, 1993). Managed as a put-and-take fishery, this reach also had higher catch rates compared to the wild trout fishery upstream. Eighty-five percent of anglers were Idaho residents.

Wildlife management areas and sportsman's access areas are funded from fishing and hunting license fees to secure access for these uses. Idaho Department of Fish and Game has arranged for public access through land ownership, or by procuring an easement from the owner. Access areas also provide opportunities for hunting, wildlife observation and nature study. Twenty-four sportsman's access areas occur within the Payette River Basin, all providing public access to angling opportunities (See Map 22, page 121).

Recreational Dredge Mining

Recreational dredge mining occurs on several reaches within the Payette River Basin. This activity is regulated by the Idaho Department of Water Resources under the One Stop Permit. Restrictions on the size of equipment used and the

Table 41. Angling Use and Catch Rates for the North Fork, South Fork and Payette Rivers.

River Reach	1980 *May 24-Oct 10* Angler hours/Catch rate	1983 *May 24-Oct 10* Angler hours/Catch rate	1992 *May 23-Sept 11* Angler hours/Catch rate	1994 *Mar 10-Apr 3* Angler hours
North Fork Payette				
Smiths Ferry to Lower Banks	3,580 hrs / 0.43 fish/hr	4,364 hrs. / 0.77 fish/hr		
South Fork Payette				
Grandjean to Alder Creek Br.	10,298 hrs / 0.85 fish/hr *(July 19-Oct 10)*			
Grandjean -Grandjean Jct			3,116 hrs./1.62 fish/hr.	
Grandjean Jct - Eightmile Ck			3,483 hrs / 1.71 fish/hr	
Eightmile Creek to Deadwood Rr			9,411 hrs / 2.21 fish/hr	
Alder Creek Br to Banks	3,574 hrs / 0.67 fish/hr.	1,173 hrs / 0.80 fish/hr		
Payette River				
Banks to Lower Banks		802 hrs / 0.77 fish/hr		
Black Canyon Dam to mouth (Steelhead fishing)				2,104 hrs.

Source: Reid, 1980; Reid and Anderson, 1981; Idaho Power Company, 1984; Elle, 1993 and Allen, et al., 1995b.

movement of material preclude commercial operations. These restrictions include the use of nozzle diameters of 5 inches or less, and equipment rated at 15 horsepower or less [Idaho Code Section 42-3803(a)]. Individuals must fill out an Individual Recreational Dredging Application from the Idaho Department of Water Resources. Additionally, the Forest Service and Bureau of Land Management mining regulations require individuals to provide a Notice of Intent indicating where dredging activities will occur.

Recreational dredge mining is prohibited or restricted at certain times of the year in some river reaches to minimize impact to spawning salmonids. Open reaches are listed in Table 42. Recreational dredge mining predominately occurs on the South Fork Payette downstream from Grandjean between Tenmile and Archie creeks, and in the Garden Valley area (Sigrist, 1997; Deaguero, 1997). Tributaries to the South Fork Payette River receiving use include Elk Creek. Minor activity occurs on the Deadwood River, Middle Fork Payette River and the Gold Fork River. Activity also occurs on Lake Fork (Mackelprang, 1998). Approximately 65 individuals have filed Notices of Intent in the Payette River Basin with the Forest Service in 1996 (Sigrist, 1997; Cropp, 1997; Deaguero, 1997). Actual use is probably twice this number, because compliance with the application requirement is estimated at about 50 percent (Sigrist, 1997; Curtis, 1997).

Camping

The majority of public campgrounds in the basin are adjacent to waterways or in close proximity (Map 23). Most of these are located on major tributaries in the basin. Estimated use for Forest Service campgrounds is based on campground fees (Table 43). Use estimates represent number of people camping, and does not account for total days a person may stay at a campground.

Public campgrounds provide more than 1000 campsites in the basin. The majority are operated by the Forest Service or by others through contracts with the Forest Service. The U. S. Bureau of Reclamation provides campgrounds surrounding Cascade Reservoir and near Black Canyon Reservoir. Bureau of Reclamation campgrounds at Cascade Reservoir and two campgrounds on Payette Lake are managed by the Idaho Department of Parks and Recreation. Some

Table 42. Reaches Open to Recreational Dredge Mining in the Payette River Basin Under the One Stop Permit.*

Reach	Period Open
North Fork Payette & tributaries	
North Fork Payette and tributaries: Headwaters to Upper Payette Lake	All year
North Fork Payette and tributaries: Big Payette Lake to Cabarton Bridge	All year
Gold Fork Creek	July 1 - October 31
Kennally Creek	July 1 - October 31
Lake Fork Creek above Little Payette Lake	July 1 - October 31
Boulder Creek	July 1 - October 31
South Fork Payette & tributaries	
South Fork Payette: Sawtooth National Recreation Area to Deadwood River confluence	July 1- October 31
South Fork Payette: Big Pine Creek to Middle Fork confluence	July 1 - October 31
Deadwood River & tributaries	July 1 - October 31
Middle Fork Payette & tributaries	July 1 - October 31

* As listed in the 1998 Recreational Dredging Application - Attachments to Application for a Permit to Alter a Stream Channel.

Map 23. Campgrounds

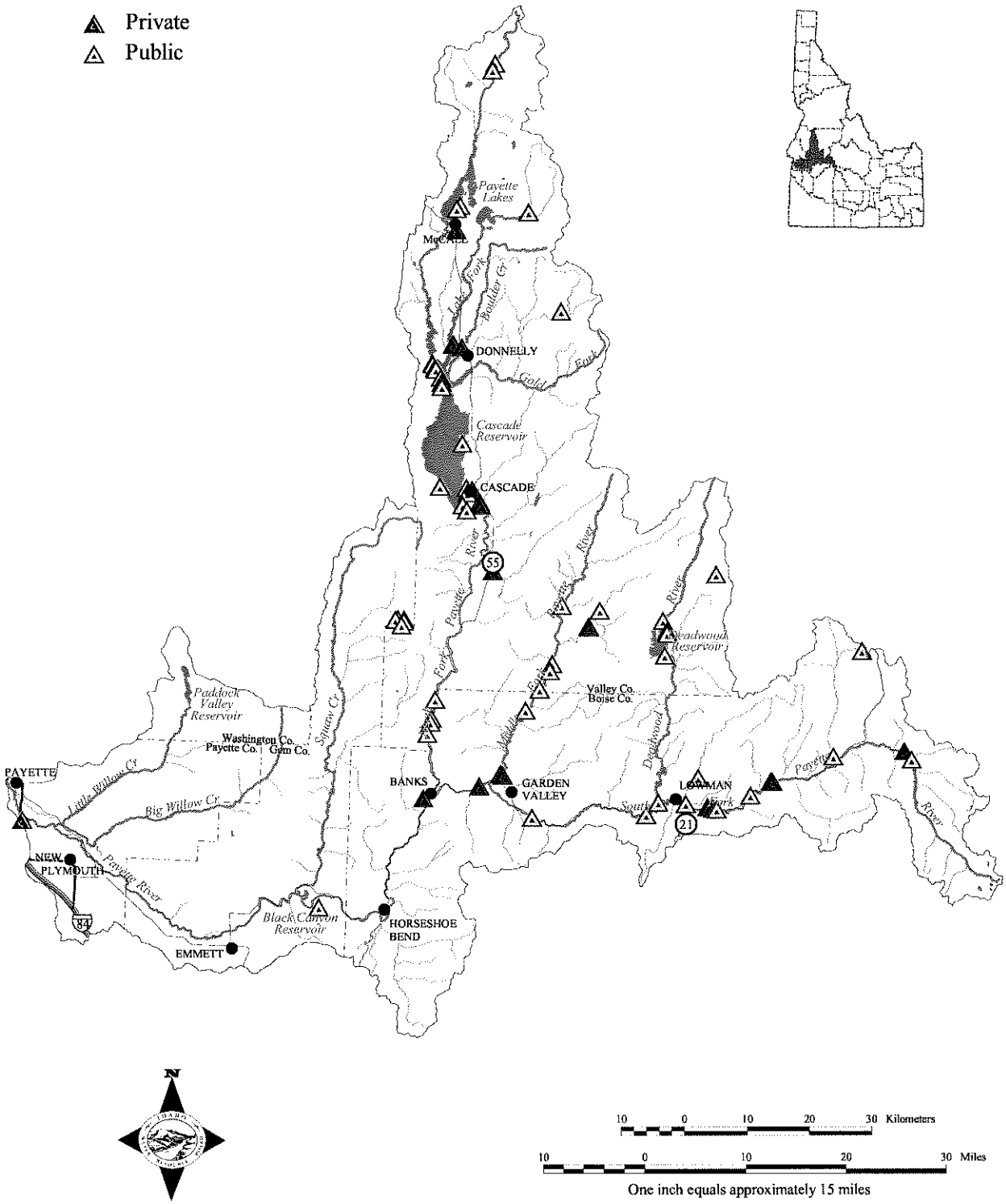

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Table 43. Public Campgrounds and Estimated Use (where available) for 1996.

Campground	No. Sites	Estimated No. of People	Landowner/Manager
NORTH FORK PAYETTE			
Upper Payette	9	Not available	Payette National Forest
Lake Fork	9	Not available	Payette National Forest
Kennally Creek	11	Not available	Payette National Forest
Paddy Flat	3	Not available	Payette National Forest
Payette Lake	170	48,595	Idaho Department of Parks and Recreation
Cascade Reservoir (3 campgrounds)	43	7,384	Boise National Forest
Cascade Reservoir (11 campgrounds)	475	Not available	U. S. Bureau of Reclamation *
Horsethief Reservoir	30	7,400 (1994)	Idaho Department of Fish and Game
Big Eddy	4	709	Boise National Forest
Cold Springs	5	483	Boise National Forest
Canyon	7	Not available	Boise National Forest
Swinging Bridge	11	1,712	Boise National Forest
TOTAL	***777***	***66,283***	
SOUTH FORK PAYETTE			
Grandjean	34	3,295	Sawtooth National Forest
Bonneville	22	11,800	Boise National Forest
Helende	10	600	Boise National Forest
Kirkham	16	1,300	Boise National Forest
Mountain View	14	4,000	Boise National Forest
Park Creek	26	2,000	Boise National Forest
Deadwood	5	1,200	Boise National Forest
Pine Flats	25	10,000	Boise National Forest
Hot Springs	7	2,666	Boise National Forest
TOTAL	***159***	***36,861***	
DEADWOOD RIVER			
Deer Flat	5	Not available	Boise National Forest
Deadwood Reservoir (4 campgrounds)	29	Not available	Boise National Forest
TOTAL	***34***	----	
MIDDLE FORK PAYETTE			
Silver Creek	4	69	Boise National Forest
Boiling Springs	9	708	Boise National Forest
Trail Creek	11	489	Boise National Forest
Rattlesnake Creek	10	539	Boise National Forest
Hardscrabble	6	527	Boise National Forest
Tie Creek	6	759	Boise National Forest
TOTAL	***46***	***3091***	
MAIN PAYETTE			
Sagehen Reservoir (4 campgrounds)	47	8451	Boise National Forest
Montour	17	Not available	U.S. Bureau of Reclamation
TOTAL	***64***	***8451***	

* U. S. Bureau of Reclamation sites at Cascade Reservoir are managed by Idaho Department of Parks and Recreation.

Source: U.S. Forest Service, Boise National Forest, 1997; Turnipseed, 1997: Hoosick, 1997; Idaho Travel Council, 1996.

camping opportunities are provided at sportsman's access areas. About 20 privately operated campgrounds with more than 1100 camping sites are found in the basin. Privately operated camping facilities are concentrated in communities in the basin such as McCall, Cascade, Donnelly, Banks, Garden Valley, Emmett, and Payette. Dispersed campsites (areas lacking services or facilities) occur throughout the basin on public lands.

Winter Sports

Although some recreational activities may be limited in the winter, extensive winter recreation opportunities occur in the basin. Groomed Nordic and snowmobile trails are prevalent. Ponderosa State Park started grooming Nordic ski trails in 1977, and today provides 10 ½ miles of groomed trails for all skill levels. The program received 20,333 visitors during the 1995-96 winter season (December 1995 to March 1996) (Hoosick 1997). Use has almost doubled since 1989 (Idaho Department of Parks and Recreation, 1994). About half of the skiers reside in Boise and the other half are from the local area, predominately McCall (Stephens, 1997). McCall Golf Course also provides groomed trails. Outside the basin, but located nearby and to the west, is the Little Ski Hill providing nordic and alpine skiing opportunities. Cross country skiing occurs in other parts of the basin, but groomed trails are not provided.

Some alpine skiing opportunities are possible in the basin as well. The back side of Brundage Mountain Ski area near McCall occurs in the upper north end of the basin. In the 1994-95 ski season Brundage Mountain received 97,328 skier visits; 82 percent were Idaho residents (Hunt, et al., 1996). Brundage Mountain Ski area accounted for seven percent of all skier visits in the state during the 1994-95 season. A portion of the Bogus Basin ski resort near Boise occurs in the south central portion of the basin. Residents expended almost $10.2 million in the 1994-95 ski season and nonresident skiers $1.6 million for alpine skiing activities at both Brundage and Bogus Basin resorts. Brundage and Bogus are the ski destination for most of Idaho's residents. Brundage Mountain Ski Area is the headquarters for the Winter Games of Idaho, the state's official winter sports contest. West of Cascade Reservoir the West Rock ski resort has been proposed.

Winter recreation is a significant part of McCall's economy. The community has capitalized on this by organizing several events including the Winter Carnival, snowmobile races, dog sledding races, and nordic ski marathons. More than 100,000 individuals attend the Winter Carnival, with Idaho residents comprising about 60 percent (Deal, 1997). The remainder of tourists originate from Oregon, Washington, Montana, and the eastern part of the United States.

Snowmobile trails are groomed by the counties with funds acquired through the registration program administered by the Idaho Department of Parks and Recreation. Almost 7,000 snowmobiles were registered in the Payette River basin region (includes Ada, Boise, Custer, Gem, and Valley counties) in 1995, comprising 21 percent of the state total. Valley County has the largest program in the state (Cook, 1997). The more than 400 miles of groomed trails are mainly located along drainages or use Forest Service Roads. The McCall area has snowmobile opportunities north of Payette Lake along the North Fork Payette, the Granite Lake area, Brundage Mountain and paralleling the North Fork of the Lake Fork River. Extensive trails are available on the west side of Cascade Reservoir connecting with the Upper Squaw Creek drainage. Another area with an extensive trail network is the Smiths Ferry area. Groomed trails within the South Fork Payette drainage occur near Grandjean, along Clear Creek in the Lowman area, and paralleling the Middle Fork Payette.

Ice fishing is a popular activity on Cascade Reservoir. Annual use varies, depending on the quality of the fishery. Table 44 indicates angler effort and catch rate trends. Ice fishing also occurs on Payette Lake, but is a minor part of the overall fishing activity on the lake.

Hunting

Big game, waterfowl, upland bird, and upland game hunting occur in the basin. Wildlife management areas and sportsman's access areas provide public access for hunters and anglers in the basin (See Map 22, page 121). The Idaho Department of Fish and Game subdivides the state into big game hunting units for management purposes. The Payette River basin consists of Big Game Hunting Units 24, 33, and 35, and the south halves of both 32 and 32A, and the west half of 34. Hunting use for waterfowl, upland birds and game are estimated by county. Hunter day estimates in the Payette Rive Basin are presented in Table 45. Hunting activity has increased between 1991 and 1995. The most significant increase has been waterfowl hunting, almost doubling for this period. Upland game hunting has increased about 150 percent. Increases in hunter days for other game has ranged from 38 to 53 percent.

Cultural Resource

They occur as artifacts, sites, structures, or other landscape features, and can be both historic and prehistoric. Our understanding of local and regional history is significantly enhanced by the presence and interpretation of an area's cultural resources. These features constitute a legacy of evidence concerning the ways our predecessors found meaning in the use and development of an area for several thousand years.

PREHISTORIC SITES

The archaeological record of the Payette River Basin is slowly being revealed through findings of the remains of cultural habitation. Many of these sites are marked by "lithic scatters," meaning sites displaying a quantity of lithic debitage which were by-products of on-site tool making. Most of the debitage are of obsidian or other easily worked rock materials brought to the site from somewhere else (Moore and Ames, 1979; Kinsbury, 1996). Many sites also contained grinding tools, scrapers, and mortars and pestles.

Because the occurrence of obsidian is not widespread, modern scientific analytical techniques have been developed which use energy dispersive x-ray fluorescence to effectively correlate obsidian flakes with their geologic sources (Kingsbury, 1996). Most of the obsidian flakes and artifacts found in the Payette River Basin have been determined to originate from the Timber Butte obsidian source.

Lithic scatters and other artifact sources have been identified at many locations in the Payette River Basin. The same features which modern man finds desirable for camping, housing locations, or relaxation

Table 44. Ice Fishing Effort and Catch Rates on Cascade Reservoir.

Winter Season	Angler Hours	Catch Rate *(fish/hour)*	Percent of Annual Angler Effort
December 1981 - April 1982	39,827	0.9	10.0 %
December 1986- March 1987	50,810	1.4	13.0 %
December 1990 - March 1991	13,823	0.67	8.0 %
December 1991 - February 1992	61,776	1.49	21.0 %

Sources: Reininger, et al., 1983; Anderson, et al., 1987; Janssen and Anderson, 1994; Janssen, et al., 1994a.

Table 45. Estimated Hunter Days for Deer, Elk, Waterfowl, Upland Birds, and Upland Game in the Payette River Basin.

Hunting Unit or County	1991	1992	1993	1994	1995
DEER					
24	12,081	9,136	13,907	9,663	13,605
32	10,626	7,465	12,468	13,697	15,697
32A	7,504	7,395	10,279	10,533	11,796
33	6,957	8,313	9,887	9,179	8,738
34	3274	1625	3987	5872	7145
35	2,817	3,083	3,912	3,079	4,424
TOTAL	***43,259***	***37,017***	***54,440***	***52,023***	***61,405***
% of State Total	***8.3***	***5.9***	***5.6***	***5.1***	***5.9***
ELK					
24	11,228	13,406	13,815	11,794	14,709
32	6,568	8,507	11,872	10,228	10,340
32A	7,330	7,983	4,184	11,737	10,424
33	10,090	10,197	13,099	10,318	13,169
34	7,083	6,895	6,299	7,501	10,456
35	4,246	3,329	4,960	4,389	5,287
TOTAL	***46,545***	***50,317***	***54,229***	***55,967***	***64,385***
% of State Total	***9.0***	***9.8***	***9.1***	***8.9***	***9.7***
WATERFOWL (includes Canada geese and ducks)					
Boise	1	NA	-	1,199	772
Gem	9,946	NA	6,617	18,729	27,679
Payette	7,170	NA	5,134	12,211	19,495
Valley	1,513	NA	2,845	3,202	6,316
TOTAL	***18,630***	-	***14,596***	***35,341***	***54,262***
% of State Total	***6.6***	-	***4.0***	***8.4***	***10.6***
UPLAND BIRDS (includes chukkar, hun, pheasant and quail)					
Boise	3,103	NA	9,215	4,983	11,819
Gem	24,390	NA	17,317	21,632	27,070
Payette	15,653	NA	24,954	11,218	25,810
Valley	34	NA	897	2,135	1,544
TOTAL	***43,180***	-	***52,383***	***9,968***	***66,243***
% of State Total	***13.7***	-	***12.1***	***11.1***	***14.6***
UPLAND GAME (includes dove and rabbit)					
Boise	249	NA	959	1,892	2,051
Gem	2,239	NA	4,206	3,821	3,940
Payette	848	NA	3,556	2,079	2,153
Valley	-	NA	124	225	264
TOTAL	***3,336***	-	***8,845***	***8,017***	***8,408***
% of State Total	***7.9***	-	***3.4***	***5.5***	***5.2***

NA=Not available

Note: Portions of Hunting Units 32, and 32A are located within the Weiser River Basin. Portions of Hunting Unit 34 are located in the Salmon River Basin.

Sources: Nelson, 1991; Kuck, 1992-1994 and 1996; and Idaho Department of Fish and Game, 1991-1995.

were also sought by prehistoric inhabitants of the area. Most have an adequate supply of fresh water, relatively level land, and perhaps a natural hot spring for bathing or recuperation. Often a location by a main travel route was favored.

Arnold (1984) notes five cultural sites at relatively shallow depths along the meandering North Fork Payette River from McCall to Cascade Reservoir and 15 sites along the west side of the reservoir. The river sites are believed to be fishing camps, while the reservoir edge sites are more diversified and may have seen both early and late periods of prehistoric occupation. The reservoir sites are all located near or beside small streams descending off West Mountain.

The Indians followed a seasonal subsistence cycle, harvesting plant and animal resources when available. Seasonal migrations of salmon provided abundant protein resource in the Payette River Basin. The salmon would be eaten fresh and dried for winter supplies. They gathered berries that were found in the area, which were also dried for later use. The camas bulb and other roots were roasted, then ground into flour and dried. Small and large game were important, and provided fresh meat supplies or preserved.

Located in close proximity to the mountains and the valley floor, aboriginal peoples who used the sites were close to a variety of resources. The valley floor provided root crops during the early summer months, fish in the Payette River during the spring and fall, and migratory waterfowl using the marsh lands near the river in all seasons. Mountains to the west provided root and berry crops from summer to fall. Hunting of bighorn sheep in the mountains, and moose, elk, and deer was possible all year. Other locations have been noted along the east side of Payette Lake (Davis, 1997).

Inventories conducted along the Middle and South Forks of the Payette River in conjunction with proposed hydroelectric and highway improvement projects have located more than 40 sites. Some provided undisturbed data upon which inferences about site functions, seasonality, or settlement patterns could be made. However, most sites were altered during historic times (Moore and Ames, 1979; Ames, 1982). Many sites are located on private land and have not been extensively analyzed. A very large site may occur at the junction of the Middle and South Forks of the Payette River and extend throughout the Crouch and Garden Valley areas. Other major sites have been discovered at the Garden Valley Ranger Station at the mouth of Alder Creek, at Grimes Pass, the mouth of Danskin Creek, and the mouth of the Deadwood River (Moore and Ames, 1979). The Pine Flats and Deadwood campgrounds have been constructed on large prehistoric sites.

Upstream along the South Fork Payette River, the Kirkham Hot Springs area was often used as a stopping and resting site along the Lemhi-Snake River Trail (U.S. Forest Service, Boise National Forest, Lowman Ranger District, no date). Other places may have been camp sites used during summer trips to the Stanley Basin and Camas Prairie, where Indians of western Idaho and bands from the upper Snake country congregated to harvest camas and socialize (Corless, 1990). The Deadwood River-Johnson Creek corridor may also have been used for travel to the South Fork Salmon River (Reddy, 1993).

Archaeological investigations in the lower Payette Basin have shown similar affinities of early inhabitants to water sources. More than 80 cultural resource sites in the Squaw Creek, Ola, and Dry Buck valleys were found close to springs or perennial streams (Shaw, 1997; Ames, 1982). The occurrence of several very significant cultural resource discoveries in similar areas lead state archaeologists to believe that the lower Payette area may also contain important evidences of prehistoric settlement (Davis, 1997).

HISTORIC PLACES

Features associated with the Euro-American settlement of the Payette River Basin are associated with mining, farming and ranching, establishment of towns, and administration of federal lands. Some have been considered eligible for listing on the National Register of Historic Sites. The National Register is an official listing maintained by the National Park Service of archaeological, historic, and architectural properties of national, state, and local significance which are worthy of preservation. Compilation of the list was begun in 1966. Other places of historic importance may not yet have been studied for National Register significance, or exist only in memory with limited physical evidence of their presence.

Relics from early mining development are found in many places. One of the most distinctive sites of this era is the Oxbow Tunnel constructed by the Golden Treasure Mining Company in 1903 about one mile above Pine Flat Campground (Reed, 1996). The tunnel is more than 1000 feet long and is unique in the realm of placer mining technology. Another notable construction effort in the same vicinity are the remains of a dam across the South Fork Payette River. This was a water diversion structure for an early hydroelectric facility which furnished power to the Boise Basin dredges. Old mine adits, waste dumps, and prospect pits are evident along Bear Valley Creek, the Deadwood River, Long Valley about a mile southeast of the Cascade Airport, and several locations along the South Fork Payette River.

Structural remnants of farms and ranches are found frequently in the Long and Lower Payette valleys, but few have been evaluated for historic significance. The Finnish Evangelical Lutheran Church east of Lake Fork, and five churches in Emmett have been listed on the National Register of Historic Places. Several Forest Service administrative sites have been considered for listing, including the Warm Springs Ranger Station (Reed, 1996). Sites of historic ferry crossings and their significance in Euro-American settlement of the area are yet to be formally analyzed.

Facilities associated with early irrigation development have enormous significance in the developmental history of the Payette River Basin. Some of the early canals in the Emmett and Payette vicinities, as well as Black Canyon Dam, are being evaluated for historic recognition (Davis, 1997). Deadwood Dam has been determined eligible for the National Register (Reed, 1996).

Scenic Values and Natural Features

The Payette River Basin is located in the Northern Rocky Mountain and Columbia Intermontane geomorphic provinces. The Northern Rocky Mountain province in the northern and eastern most portions of the basin are noted for well-developed glacial features, including u-shaped valleys with steep walls and sharp ridges. Other portions of the province are characterized by deeply, incised v-shaped valleys. The Columbia Intermontane province is characterized by undulating topography leveling out to the flat Snake River plains of southern Idaho; typical of the landscapes found in the Main Payette subbasin. The *Geomorphology* section describes the characteristics of these provinces in more detail.

Landscape features in the basin contributing to the outstanding natural and scenic values include mountain ranges and peaks, lakes, natural hot springs, waterfalls, granitic canyons, and rivers. The most notable are described here based on special agency designation or management, but is by no means a complete inventory of important scenic and natural features in the Payette River Basin. An overview of outstanding natural areas conducted for several state agencies identified many landscapes in the Payette River Basin noted for scenic values (James C.

Montgomery, 1975). Many of these have been proposed as National Natural Landmarks, indicating the "sites [are] determined to be one of the best examples of a natural region's characteristic biotic or geologic features" (National Park Service, 1987, see Map 24). Nomination for inclusion in this program is an indication of the uniqueness of a feature.

Research Natural Areas comprise a national network of ecological landscapes set aside for research, education, and to maintain biological diversity. Areas selected are representative of typical and important landscapes with special or unique characteristics. A number of Research Natural Areas managed by the national forest occur in the basin and are depicted in Map 24.

North Fork Payette Subbasin

An overview of environmental attributes in Idaho noted the highly scenic values of the following waterbodies in the upper end of the North Fork Payette subbasin -- Upper Payette Lake, Payette Lake, Little Payette Lake, and numerous alpine lakes (James C. Montgomery, 1975). Other scenic waterbodies identified in the subbasin are Cascade Reservoir and the North Fork Payette River, and the pastoral, scenic valleys they are located.

Scenic values of the Lake Fork drainage are also mentioned, most notably the North Fork Lake Fork canyon (James C. Montgomery, 1975). The area is relatively pristine and dominated by huge, outcrops of granite and Late Cretaceous biotite granodiorite of the Idaho batholith. Pleistocene glaciers moving down the valley have polished the rocks and created hanging valleys. A notable rockform is Slick Rock, an enormous granite monolith. The site has been proposed for designation as a National Natural Landmark (Hyndman and Alt, 1982)

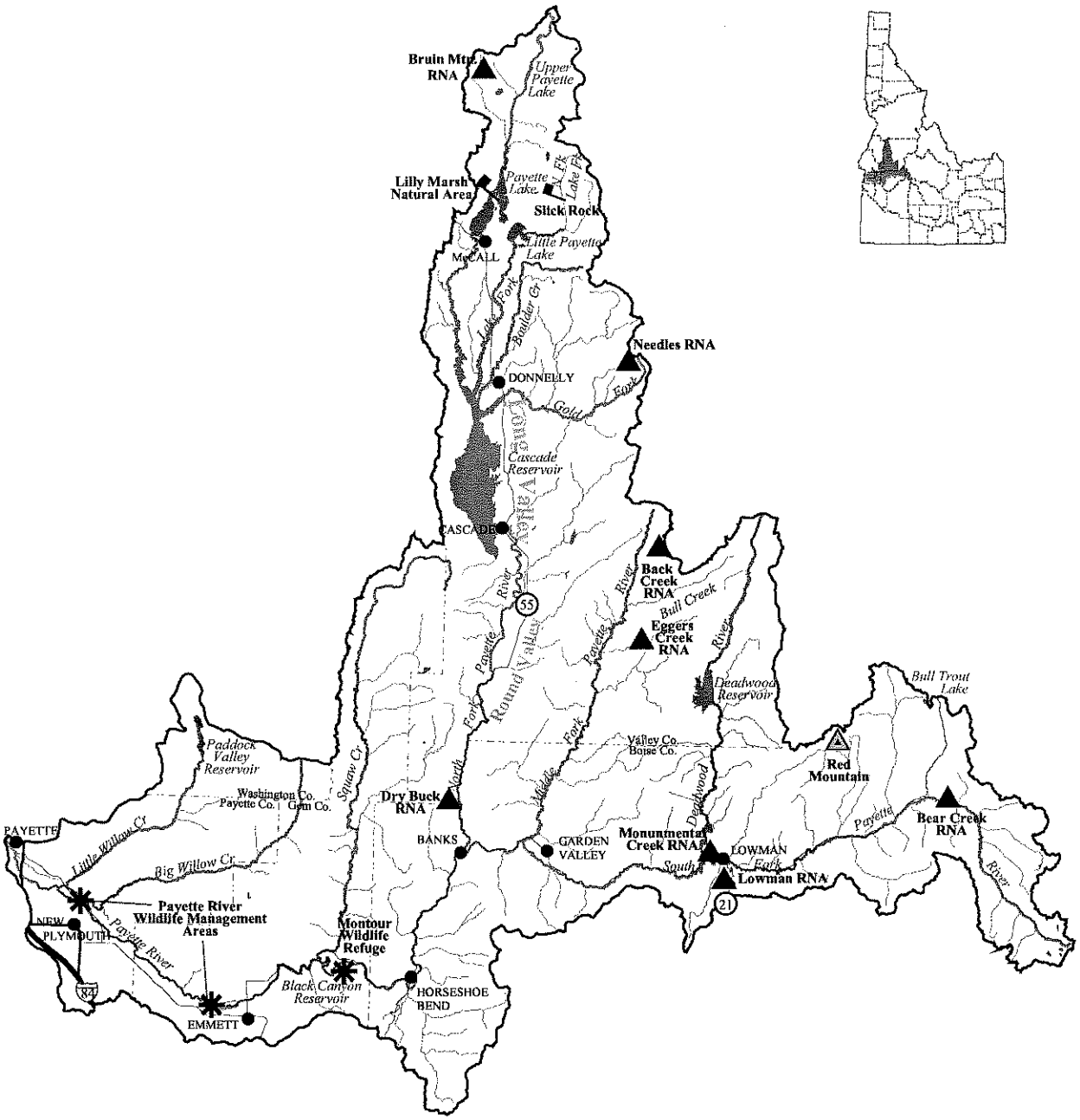
Ponderosa State Park is located on the peninsula extending into Payette Lake (James C. Montgomery, 1975). In 1982 the Idaho Parks and Recreation Board designated the Lily Marsh Natural Area to preserve unique natural features, including an undisturbed marsh ecosystem not commonly found in Idaho, and a rare plant community of Engelmann spruce/common horsetail (Idaho Department of Parks and Recreation, 1994). The natural area has also been nominated as a National Natural Landmark.

Three Research Natural Areas occur in the North Fork Payette subbasin. Bruin Mountain, located west of Upper Payette Lake in the North Fork Payette and Little Salmon drainages, is characterized by an alpine mountain setting with a hanging valley, a rare plant species of *saxifrage*, and mature and old growth subalpine fir/Engelmann spruce stands (U.S. Forest Service, Payette National Forest, 1988). Notable features in the Needles Research Natural Area, located in the Gold Fork drainage, include a lake, wet meadows, alder glades and subalpine fir habitat (U.S. Forest Service, Boise National Forest, 1990). Dry Buck Research Natural Area is located along the North Fork Payette above Banks, encompassing the southernmost occurrence of grand fir in Idaho (U.S. Forest Service, Boise National Forest, 1990).

South Fork Payette Subbasin

A variety of natural features and scenic assets occur in the South Fork Payette subbasin, including the high elevation peaks of the Sawtooth Wilderness, hot springs, open ponderosa pine vistas, and rugged granitic canyons. Scenic natural areas noted in an inventory of environmental attributes identified the South Fork Payette River, Middle Fork Payette River, Bull Trout Lake, and Bull Creek (James C. Montgomery, 1975). Other landscapes considered "highly scenic" are the Tenmile Creek area, located adjacent to the Sawtooth National Recreation Area east of Lowman, and Red Mountain, found northeast of Lowman.

Map 24. Scenic and Natural Features



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Five Research Natural Areas are found in this subbasin (Map 24). Bear Creek Research Natural Area, located east of the Grandjean junction adjacent to the South Fork Payette, preserves undisturbed sagebrush-grass vegetative features and is also proposed as a National Natural Landmark (U.S. Forest Service, Boise National Forest, 1990). Lowman Research Natural Area, located southwest of Lowman on the South Fork Payette, preserves the natural features of a ponderosa pine community. This landscape also is proposed for designation as a National Natural Landmark. Monumental Creek, found on the South Fork Payette between Lowman and the Deadwood River, is considered a good representation of a ponderosa pine/Douglas fir habitat type with a bitterbrush understory. Two of the Research Natural Areas are located in the Middle Fork Payette drainage and include Back Creek, providing "excellent" examples of several subalpine fir types, and Eggers Creek, functioning as a control watershed with grand fir and Douglas fir forest types.

Main Payette Subbasin

The Main Payette subbasin is predominately located in the Columbia Intermontane geomorphic province. Landscape features are significantly different than the North Fork Payette and South Fork Payette subbasins. Characteristic landscapes consist of rolling topography and predominately sagebrush-grassland plant communities. Irrigated agriculture and rangeland are the predominant land uses. Three priority wetlands, a prioritized list of wetlands that merit protection as determined by the National Wetlands Priority Conservation Plan, occur along the Payette River downstream of Horseshoe Bend (Idaho Department of Parks and Recreation, 1998). Priority wetlands include Regan Bend on the Black Canyon Reservoir, Payette River Slough, and Birding Island. The Payette River is also cited as a scenic resource (James C. Montgomery, 1975).

An evaluation of the scenic values of waterways in the basin was conducted as part of the Payette River Basin Plan. The evaluation and results are presented in the *Resources Evaluation* section that follows.