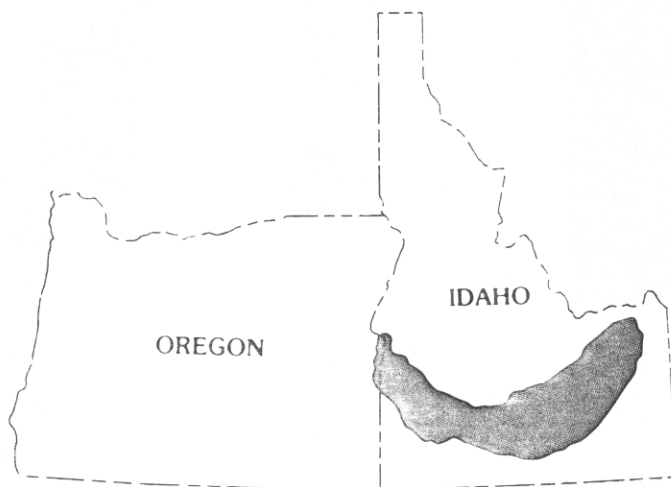


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WATER USE ON THE SNAKE RIVER PLAIN, IDAHO AND EASTERN OREGON



SNAKE RIVER PLAIN RASA PROJECT

TABLE 12.—Nonindustrial public-supply water use and population served by county, 1980

(<, less than)

County	Population served by public supplies	Withdrawal for public supply (acre-feet per year)	Source of water (G, ground water; S, surface water)
Ada.....	141,940	36,100	G
Bannock.....	16,430	4,200	G
Bingham.....	18,790	4,700	G
Blaine.....	160	<100	G
Bonneville.....	50,120	10,500	G
Butte.....	1,320	300	G
Canyon.....	58,810	15,200	G
Cassia.....	10,860	2,800	G
Clark.....	540	100	G
Elmore.....	17,250	4,400	G
Fremont.....	4,870	1,300	G
Gem.....	5,290	1,400	G
Gooding.....	5,880	1,400	G
Jefferson.....	5,280	1,400	G
Jerome.....	8,630	2,200	G
Lincoln.....	1,620	300	G
Madison.....	12,290	3,000	G
Malheur, Oreg...	12,100	1,600	G,S
Minidoka.....	12,070	2,500	G
Owyhee.....	3,270	800	G,S
Payette.....	10,310	2,200	G
Power.....	3,880	1,000	G
Twin Falls.....	33,340	3,800	G
Washington.....	4,860	1,200	G,S
Total.....	439,910	102,400	

and Jefferson Counties. Consumptive use was 53 percent, or 3,900 acre-ft. The rest was returned to the aquifer via injection and drain wells and leaching ponds.

INSTREAM WATER USES

Instream water uses do not involve either withdrawals or significant consumptive use of water. However, when perfected as senior water rights, they limit the availability of water for other uses by requiring continuous minimum flows at specific locations. Instream water uses include hydroelectric power generation, minimum flows for fish habitat preservation, and recreation.

HYDROELECTRIC POWER GENERATION

Since the early 1900's, availability of inexpensive hydroelectric power has been important to Idaho's economic development. With an abundance of free-flowing water, Idaho has relied almost exclusively on hydroelectric power. About half of the State's hydroelectric power facilities are within the study area on the Snake River and its tributaries (fig. 29).

An estimated 52 million acre-ft of water was used in 1980 to generate 2.6 million MWh of electricity on the Snake River Plain. This is about 30 percent of the total hydropower generation in Idaho. About 39.4 million acre-ft of water was used on the eastern plain and 12.3 million on the western plain.

Water use for hydropower generation was estimated by IDWR from power generation data provided by the Federal Energy Regulatory Commission. Data on water use and power produced in 1980 are shown by county in table 14. Virtually none of this water was consumptively used; after passing through a power generation plant, the water was available for downstream use. The small amount of water evaporated from reservoirs associated with hydropower generation is accounted for as evaporation from open water.

Continued instream flows are necessary to generate electricity at current levels. During early development of Idaho's water resources, abundant supplies precluded competition between power generation and other water uses. As development proceeded, competition for water use increased. When flows are low, consumptive water use upstream from a power generating facility reduces the amount of water available for power generation.

TABLE 11.—*Aquaculture water use by county, 1980*

County	Number of fish farms	Withdrawal (acre-feet per year)
Ada.....	1	2,000
Bannock.....	2	56,000
Bingham.....	2	183,000
Gooding.....	16	1,370,000
Jerome.....	2	152,000
Power.....	1	12,000
Twin Falls.....	9	131,000
Total.....	33	1,906,000

annual evaporation from open water is 36 in./yr, total consumptive use by fish farms would equal 990 acre-ft/yr. Few, if any, fish farms have 10 acres of open water and most have much less, so consumptive use by aquaculture on the Snake River Plain probably amounts to less than 1,000 acre-ft/yr.

NONINDUSTRIAL PUBLIC SUPPLY

Nonindustrial public supply refers to water withdrawn by public and private water suppliers and delivered for domestic, public, and commercial uses. Domestic uses include drinking, food preparation, washing, and lawn and garden watering. Public uses include schools, fire departments, and municipal parks. Most commercial establishments also use public supplies.

Nonindustrial public-supply withdrawals in Idaho were estimated using the equation:

$$Q = [(P) (231 \text{ gal/d}) (0.00112015)] - I \quad (4)$$

where

Q is volume withdrawn for nonindustrial public supply, in acre-feet;

P is population served by public supplies; and

I is public-supply withdrawals for industrial use, in acre-feet.

Data on population served by public supplies and public-supply withdrawals for industrial use were provided by IDWR. The value for per-capita public-supply withdrawals (231 gal/d) is the average reported value for Idaho in 1980 (Solley and others, 1983, p. 10). The constant (0.00112015) converts gallons per day to acre-feet per year. Volumes withdrawn for public supply in Malheur County, Oregon, were reported by D.D. Nebert (U.S. Geological Survey, oral commun., 1983).

In 1980, about 102,000 acre-ft of water was withdrawn on the Snake River Plain for nonindustrial public-supply

uses. Table 12 shows estimated withdrawals, population served, and source of water by county, and figure 28 shows the locations of public-supply withdrawals. More than 95 percent of public supply is ground water (Association of Idaho Cities, 1980). Solley and others (1983, p. 10) reported that consumptive use of nonindustrial public supply in Idaho was about 22 percent. On the basis of this rate, consumptive use of nonindustrial public supply in 1980 on the Snake River Plain was estimated to be about 22,000 acre-ft.

RURAL

Rural water use includes water for domestic and livestock needs supplied by private systems. Domestic withdrawals were estimated using 98 gal/d per person, which is the average per-capita rural domestic use for the 17 Western States (Solley and others, 1983, p. 33). To determine the population supplied by private systems in each county, the population supplied by public systems was subtracted from the total 1980 population. However, parts of counties lie outside the study area. In those counties, rural populations were assumed to be distributed uniformly over the county and thus were multiplied by the percentage of the county in the study area. All rural domestic water is assumed to be ground water.

Amount and source of withdrawals for livestock were derived from estimates prepared for a national water-use summary. Withdrawals for livestock were assumed to be distributed uniformly within each county and were adjusted as above for those counties partially outside the study area.

Withdrawals for livestock in Malheur County, Oregon, were estimated from reported livestock populations (U.S. Bureau of the Census, 1981; Oregon Crop and Livestock Reporting Service, 1982). Total populations of horses, cattle, sheep, pigs, chickens, and goats were multiplied by their daily per-capita use as reported by Murray (1968, p. 4) and by the percentage of Malheur County included in the study area. Withdrawals were assumed to be equally from surface and ground water.

Amounts of rural domestic and livestock withdrawals are presented by county in table 13 and locations are shown in figure 28. In 1980, an estimated 23,000 acre-ft was withdrawn from surface and ground water for rural uses. About 13,000 acre-ft was used for domestic purposes and 10,000 acre-ft for livestock. In previous water-use estimates, the U.S. Geological Survey (Solley and others, 1983, p. 14) reported that consumptive use was about 24 percent of domestic withdrawals and 86 percent of livestock withdrawals. On the basis of these rates, consumptive use of rural domestic and livestock withdrawals was estimated to be about 11,800 acre-ft.