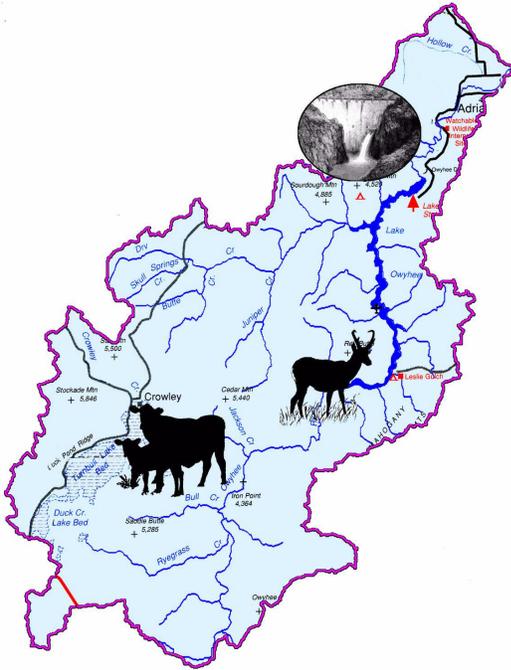


Lower Owyhee Watershed Assessment

VI. Water Use

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Ecological Services



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VI. Water Use

A. Water sources

There are various sources of water used within the lower Owyhee subbasin. Water in wells comes from ground water in aquifers below the surface. Ground water from springs or seeps contributes to the surface water in streams. Water from snow melt is carried in streams.

The water from wells or springs can be used at the source. Water in the streams can either be diverted from the stream for direct use or can be captured within a pond or reservoir behind a dam. The water from any one of these sources can be used by cattle or wildlife, for irrigation, or for human consumption.

B. Water rights

Under Oregon law, all water is publicly owned.¹⁸ Rights to use water are determined and administered by the State of Oregon as laid out in ORS 537.211 and ORS 537.250.¹² In general water right permits are issued for the development of water

and water right certificates are issued to use the water after the source has been developed. Water right certificates specify the source and location of the water, how the water may be used, where the water will be used, and how much water may be used. There are both senior water rights, those granted at the earliest time, and junior water rights, those granted at a later date. In the case that there is not enough water to satisfy the needs of all entities with a right, the state can require those with a junior right to stop using water so as to provide water to the senior right.^{8,18} A water right is subject to cancellation if it hasn't been used for five consecutive years.¹⁸

Most use of surface water in the lower Owyhee subbasin, either from a stream or a reservoir, requires a water rights certificate issued by the Oregon Water Resources Department. Most of the wells do not need a water rights certificate since all stockwater use of groundwater is exempt.^{12,8}

C. Water use

1 Dams

a. Regulations

All dams within the subbasin are required to have a State of Oregon water use certificate. Many dams built before January 1, 1993 did not have a certificate. These unpermitted reservoirs had to have an application filed for a water right certificate before January 1, 1995.¹² At that time the Bureau of Land Management (BLM) filed multiple applications where the only identification of the dam was "a reservoir", "reservoir 48-0 1", or "reservoir 48-0 2". In this assessment there has been a concerted effort made in distinguishing between dams within the same township, range and section to ensure that they are distinctly different dams. This endeavor has been complicated by new permits and certificates being issued for the enlargement or increased use of an existing dam without the previous certificate being canceled and by apparent duplicate filings by the BLM on the same dam.

One of the criteria for applying for a right to use an unpermitted reservoir constructed before January 1, 1993 is that the dam is "located off-channel" and does not "divert water directly from a natural stream, lake or other on-channel source."¹² In other words, for these dams to receive a water right they can not be in a perennial or intermittent stream. An example of the location of an "off-channel" dam is taken from a private party's application in which he explains, "There is no defined stream or water course, but it is the flood water from melting snow and surface drainage from Juniper Mt. to west of reservoir. It may be called 'Juniper Creek'."¹⁰ In many of its applications for reservoirs the BLM states that the impounded water will be from an "intermittent" stream. The BLM has not distinguished between intermittent and ephemeral streams in its applications. However, in order to have obtained the permits, the streams on which dams have been constructed must be ephemeral streams. (See the hydrology section for a discussion of the difference between intermittent and ephemeral streams.)

b. Dams in the lower Owyhee subbasin

Water rights for a specific township, range and section can be accessed on the internet on the Water Resources Department web page.¹¹ In this assessment of the

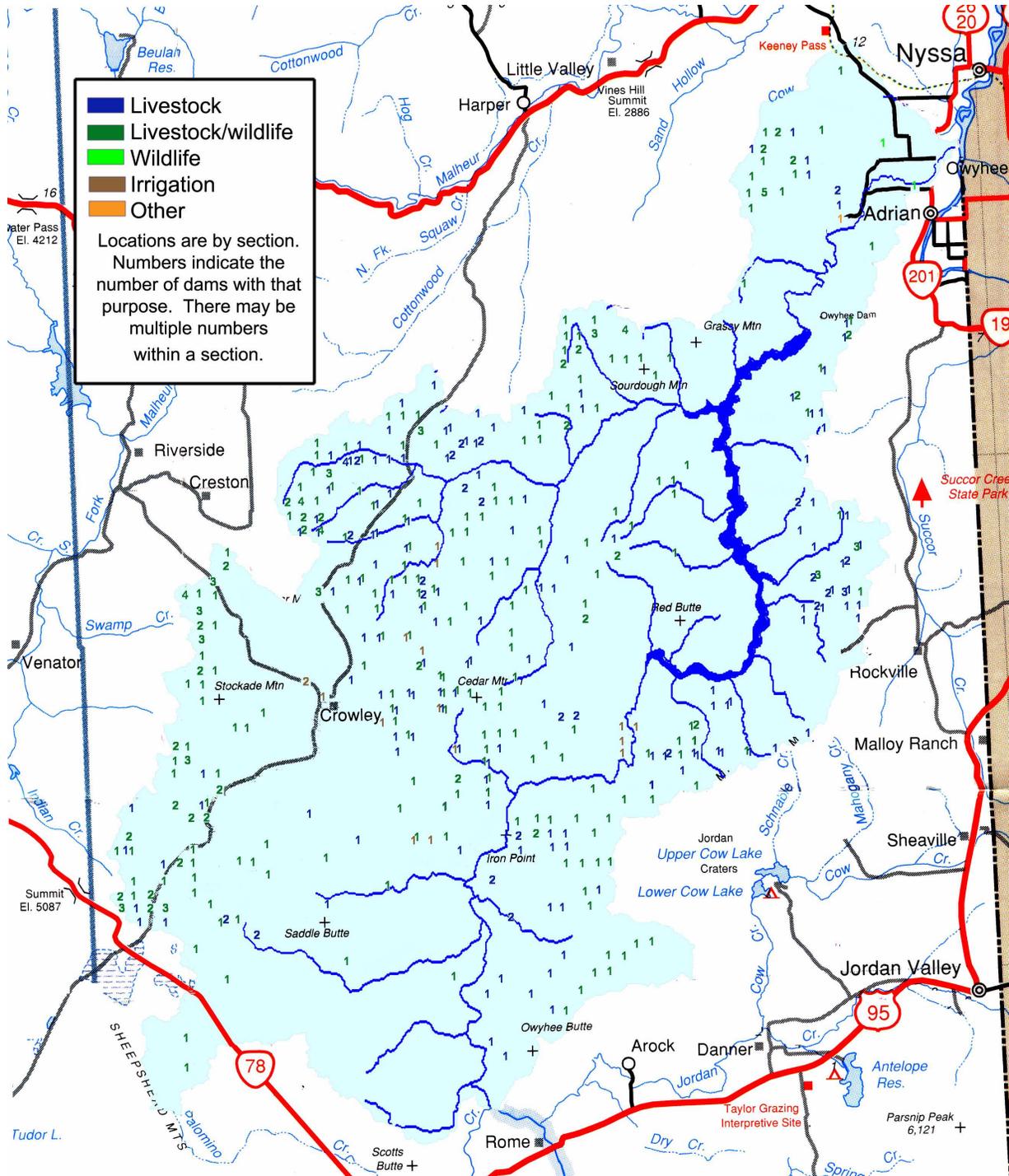


Figure 6.1. Reservoirs and ponds in the lower Owyhee subbasin .

lower Owyhee subbasin we have tried to compile a list of locations for every dam, well, or surface water right by examining the record for every section in the lower Owyhee watershed. The compiled record includes the location by section, the permitted use of the water, the name or source of the water, and whether the permittee is the BLM, a

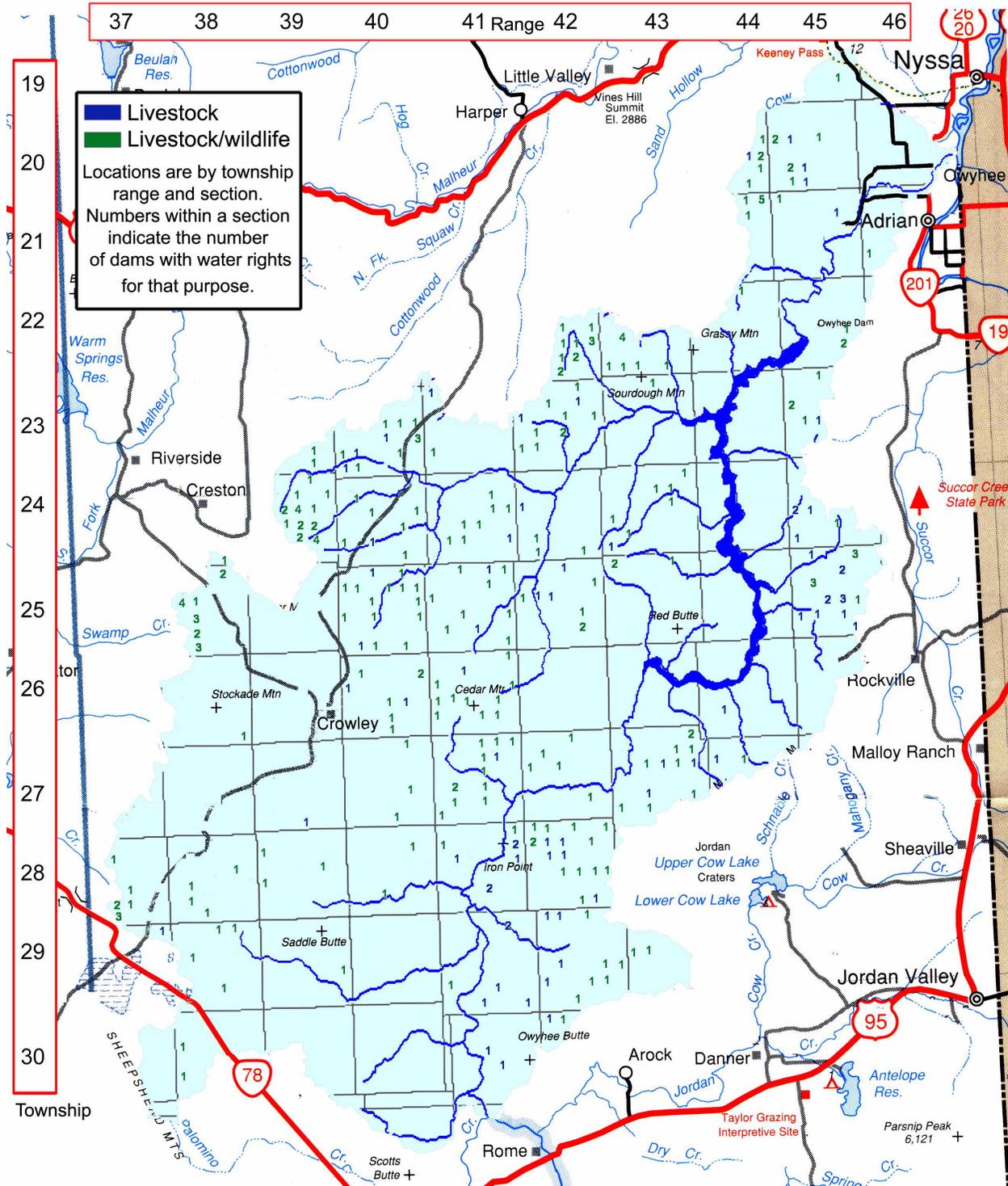


Figure 6.2. Reservoirs with BLM water rights in the lower Owyhee subbasin .

private individual or company, or another public agency. Appendix C contains the compiled list.

There are 540 dams other than the Owyhee Dam in the lower Owyhee subbasin (Figure 6.1). BLM has certificates for 336 dams (Figure 6.2), private entities have

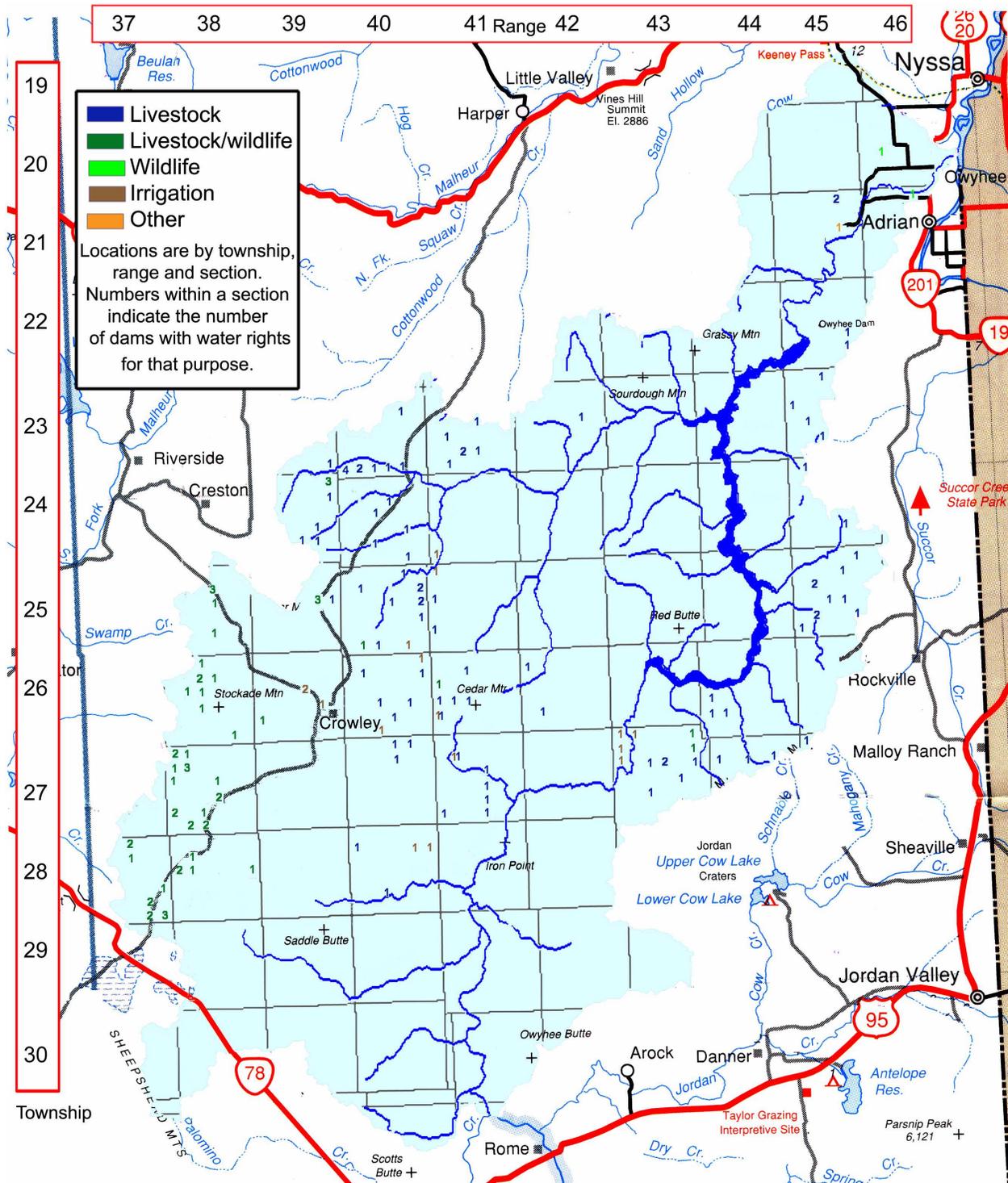


Figure 6.3. Reservoirs with privately held water rights in the lower Owyhee subbasin .

certificates for 172 dams (Figure 6.3), Oregon Department of State Lands has certificates for 31 dams (Figure 6.4) and the Bureau of Reclamation for one small dam.

Two hundred and eight of the certificates were issued specifying use by livestock, 311 specifying both livestock and wildlife, 2 for wildlife, 16 for agriculture or irrigation and the remaining three for multiple purposes (Table 1).

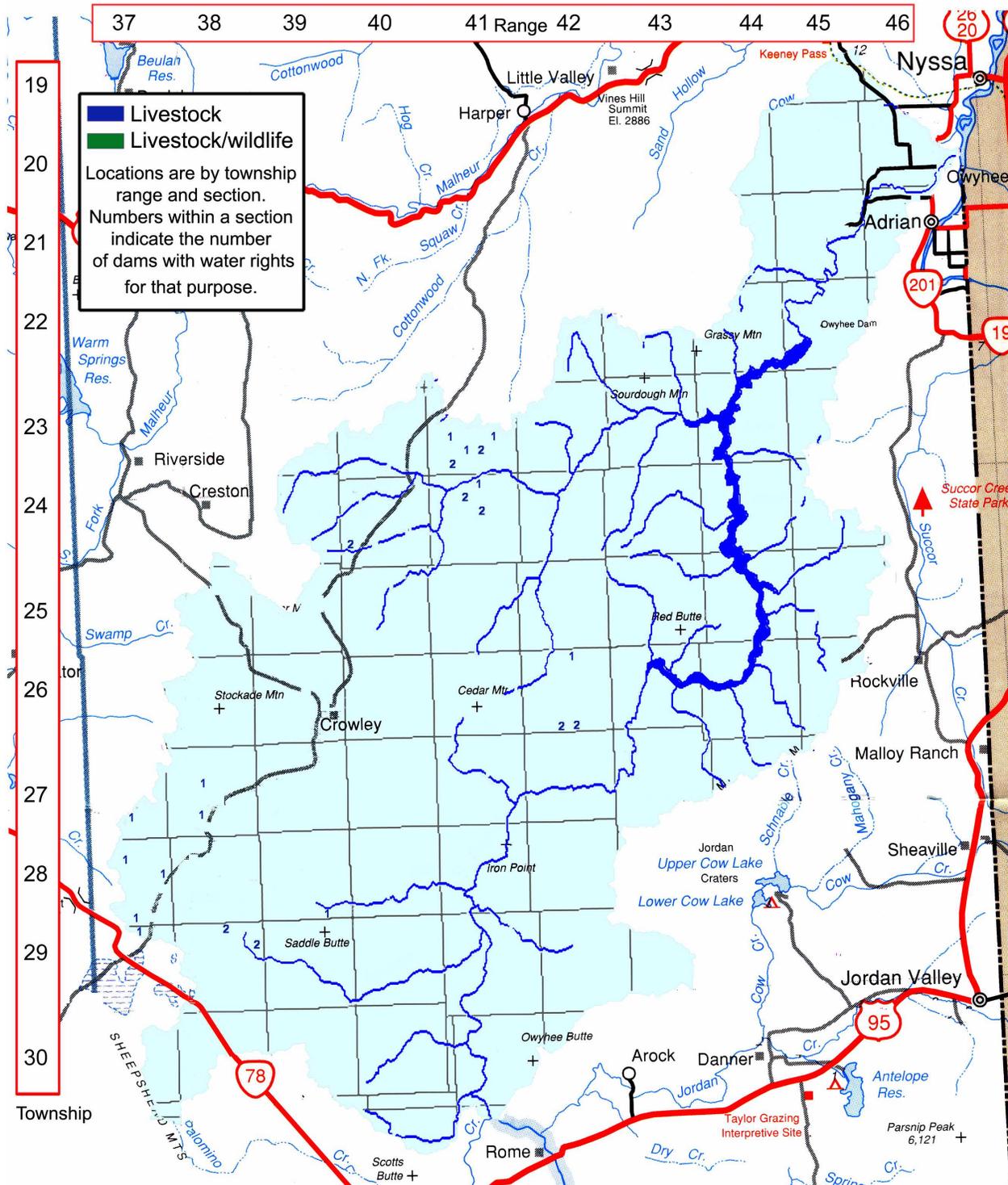


Figure 6.4. Reservoirs with water rights held by Oregon Division of State Lands in the lower Owyhee subbasin .

If the certificate for a reservoir allows a specific use, water from that reservoir which is diverted to water tanks or troughs may be used for that use and do not require a second water permit or certificate.¹²

Table 1. Ownership of water rights and use of water for dams other than the Owyhee Dam in the lower Owyhee subbasin. October 2006.^{11,10}

	BLM	Private	State lands	BOR	
Livestock	83	94	31		208
Livestock/wildlife	253	58			311
Wildlife		2			2
Agriculture		5			5
Irrigation		11			11
Multiple		2		1	3
	336	172	31	1	540

There are approximately 15 dams in the subbasin that the state watermaster checks every year or every 5th year depending on their height. These are reservoirs where a failure of the dam could possibly create damage downstream to either human life or property. The watermaster is currently surveying other dams to see whether they should be included on this list. The survey of encompasses looking for buildings downstream from the dam that are potentially at risk.⁸

There are a number of factors which the watermaster looks at when the dams are checked. Vegetation on the banks, particularly deep rooted vegetation could create voids through which water could flow. Any rodent activity would also potentially create a problem as would any other erosion. The spillways are checked to be certain that there is no debris which could plug them. The discharge facilities, either head gates or spillways with flashboards, are checked.⁸

2 The Owyhee Project

The Owyhee River itself is captured and dammed by the Owyhee Dam. The Bureau of Reclamation holds the certificates for the water rights from the dam.

a. History

Lands in the Owyhee project area were first irrigated in the latter half of the nineteenth century.¹ There were about eight families farming lands bordering the lower Owyhee River who joined together in 1883 to construct a ditch along the north bank of the Owyhee River to supply water for a gravity system of irrigation.^{14,7,9} In 1888 the Owyhee Ditch Company was formed and built a diversion dam southeast of Mitchell Butte with a permit allowing them to take 41,000 acre-feet of water from the Owyhee River.¹⁴ By 1900 farming areas in the lower Owyhee subbasin were being irrigated with water diverted from both the Snake and Owyhee Rivers. Several Snake River pumping plants were later installed.¹ In 1926, as part of a series of legal decisions on water rights known as the Owyhee Decree, it was determined that the original families had consigned their rights to the Owyhee Ditch Company and the priority date for all Owyhee Ditch Company rights was October 1888.⁵

Early irrigators had decided that a dam which could hold enough water to reliably provide irrigation water throughout the growing season was essential to future

prosperity.¹⁴ By 1924, the federal government was interested in construction of dams with the primary purpose of extending irrigation and with "such control by the government as to prevent interference with the use of the stored water in irrigation."¹⁴

Water shortages occur repeatedly throughout the entire Owyhee basin. When Owyhee Dam was constructed, there was a realization that water shortages would be of critical importance below the dam when irrigation became essential to the anticipated intensive agriculture. Due to the highly variable runoff in the Owyhee basin, Owyhee Dam was sized to provide a two year water supply.^{1,16}

In 1926 the Owyhee Project was authorized and by October the first train used the completed railroad to the construction site of the Owyhee Dam.^{3,14} Although the dam was dedicated in 1932, it was 1935 before the first water from the Owyhee project was supplied to farms.^{14,7,9,1}

b. Owyhee Project facilities

The total capacity in the Owyhee Reservoir behind the dam is 1,120,000 acre-feet with an active capacity of 715,000 acre-feet. Originally plans were to use gravity to supply the entire project with water from Owyhee Reservoir.^{1,3} However, because "of the irregularity of flow of the Owyhee River" it was "necessary to use Lake Owyhee on a holdover basis. To make this accumulation of storage possible, the construction of facilities to pump from the Snake River to lower-lying project lands was begun in 1936."¹

In addition to the Owyhee Dam and the Snake River pumping plants, the facilities of the Owyhee Project include the North and South Canals. Water is released from Owyhee Reservoir through a three and a half mile long tunnel to the headworks of the North and South Canals. The water enters the tunnel in the reservoir 80 feet below the normal maximum water surface. The North Canal delivers water to the north and the South Canal delivers water to the southeast.^{1,3}

The BOR operated and maintained all of the Owyhee Project until 1952. In 1952, all project works other than Owyhee Dam and related works were turned over to the North and South Boards of Control. In 1954 the operation and maintenance of Owyhee Dam and related works were also turned over. The North Board of Control is now the Owyhee Irrigation district. The Owyhee Irrigation District operates Owyhee Dam in cooperation with the South Board of Control.^{1,17}

The Owyhee Irrigation District controls the release of stored water from Owyhee Reservoir.

c. Water use

i. History

In 1924, the Secretary of the Interior, Hubert Work, articulated that the "primary purpose of all reclamation construction is to extend irrigation. In all storages there will be incidental benefits to come from the development of power . . . there should be such control by the government as to prevent interference with the use of the stored water in irrigation."¹⁴ The water in Owyhee Reservoir was designated for irrigation.

Irrigated acreage in the Owyhee Project has increased since the beginning in the 1930s. In 1936 the Owyhee Project irrigated 8,609 acres. By 1939 there were 73,040 acres irrigated. In 1951 the number of irrigated acres had increased to over 97,000. By 1965 more than 111,000 acres of crops were receiving irrigation water through the project.¹³ Today the project provides water to fully irrigate over 105,224 acres of land and supplemental irrigation water for 13,000 acres of land.^{3,2} About 72 percent of the lands irrigated by the project are in Oregon and about 28 percent are in Idaho.³

ii. Irrigation in the lower Owyhee subbasin

The Bureau of Reclamation has a certificate to use the water from the Owyhee Reservoir to irrigate about 15,970 acres in the lower Owyhee subbasin (Figure 6.5). The bureau has a certificate for supplemental irrigation on about 2,555 acres in the subbasin with rights for about 800 of these acres being pumped from the Snake River. Of these 2,555 acres, the bureau rights for supplemental irrigation are the principal source of water on about 2,170 acres.^{11,10} The water right is restricted to a maximum of 3 acre-feet per acre from the dam and a maximum of 6.7 acre-feet per acre secured under any combination of existing rights for the same lands.¹⁰

The principal crops grown in the lower Owyhee subbasin with this irrigation differ in the amount of water they consume in a year in acre-feet per acre averaging: 3.5 for alfalfa, 2 for winter grain, 2.2 for spring grain, 2.8 for sugar beets, 2.4 for onions, 2.3 for potatoes, 1.7 for dry beans, and 2.3 for field corn.⁶ Irrigation amounts are usually required in excess of crop consumptive use due to inefficiencies in any irrigation system and the need for a leaching fraction to avoid the accumulation of salt in the soil.

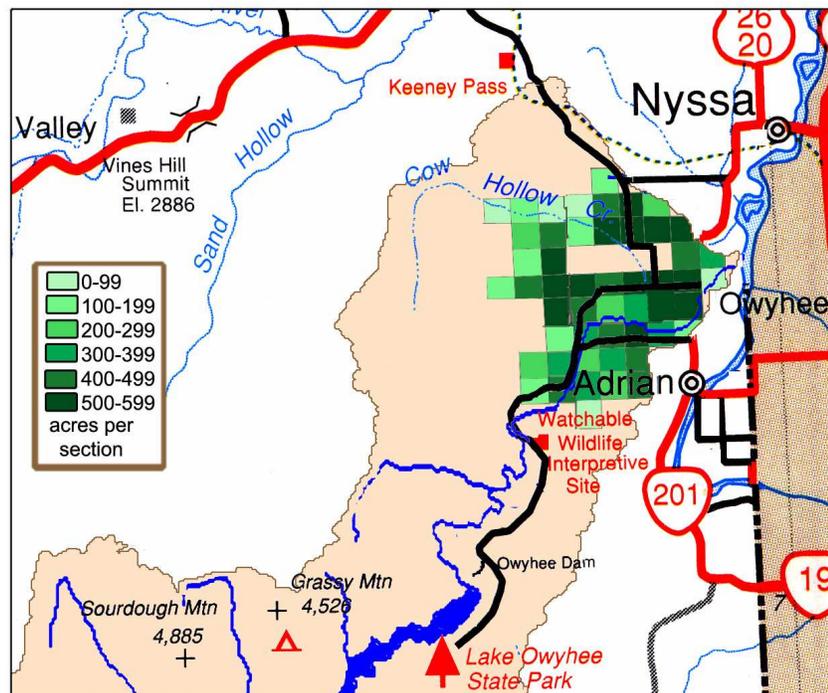


Figure 6.5. Acres of irrigated land in the lower Owyhee subbasin irrigated with water from the Owyhee Project.

Growers have increased their efficiency in using irrigation water through the incorporation of many innovations. These innovations are discussed in the Irrigated Agriculture section of this assessment.

In addition to the acreage irrigated with water from the reservoir and pumped on the Snake River, there are substantial return flows in drainage canals which are reused

for irrigation. District-wide approximately 30 percent of the water entering main drainage canals is reused.¹⁷

iii. Recreation

By 1937, a park had been created at Owyhee Reservoir with trees and grass planted and two double-unit stone fireplaces. Although the rocky shoreline of the reservoir was not very appropriate for much swimming, both boating and fishing became popular in the area. The Bureau of Reclamation stocked the Owyhee Reservoir with both cutthroat and rainbow trout. It was also stocked with crappies, bass, perch, and Eastern brook trout.¹⁰

Both fishermen and recreational boaters take advantage of Owyhee reservoir. The water which provides opportunities for recreation in the reservoir is later used for irrigation by the Owyhee Project.

There is also water being released from the dam to maintain an artificial cold water fishery below the dam. A minimum flow of 30 cfs is being maintained.⁴

iv. Hydroelectric generation

In addition to being used primarily for irrigation, there are three hydroelectric generating facilities on the Owyhee Project. In the 1980s irrigators obtained Federal Energy Regulatory Commission licenses to construct and operate hydroelectric power-plants. During dam construction of Owyhee Dam, an outlet facility was installed and now contains a 5,000 kilowatt power-plant. There is also an 8,000 kilowatt power-plant at Tunnel No. 1, the major diversion works for the project, and a 2,000 kilowatt power-plant on the Mitchell Butte lateral. These power-plants went online between 1985 and 1993. These power-plants generate a combined total of 15,000 kilowatts of electricity used by power customers in Idaho and Oregon.^{3,17, 16}

The certificate for use of the water for power generation explicitly states that the "right granted herein is expressly made inferior in right and subsequent in time to any appropriation of water from this source which may hereafter be made for domestic, municipal, irrigation or any other beneficial consumptive use, or for storage for such purposes."¹⁰

v. Flood control

Flood damage has occurred below the Owyhee Reservoir along the Owyhee River. A flood similar to that of 1894 or 1910 before construction of the dam would inundate about 2,000 acres that is cultivated today.¹ The 1952 flood caused damages to 1,800 acres of agricultural land¹⁵ and the 1984 flood caused damages to a similar number of acres.

Although all of Owyhee Reservoir's active storage capacity of 715,000 acre-feet is contracted for irrigation, the Bureau of Reclamation has developed informal flood control guidelines for the reservoir.¹⁶ Water released for flood control passes through the lower Owyhee subbasin without being intercepted for any other purpose.

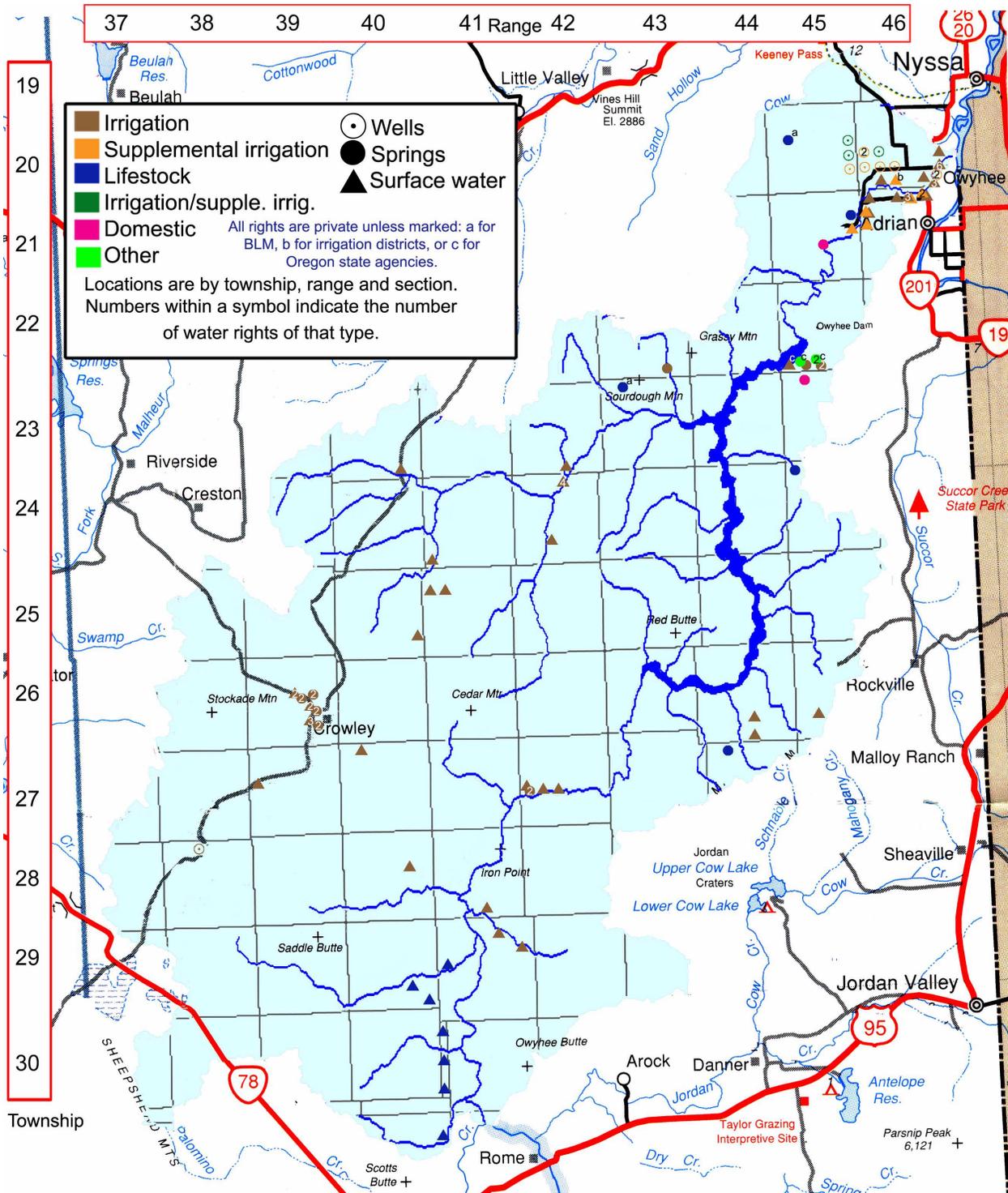


Figure 6.6. Surface water, spring, and well water rights in the lower Owyhee subbasin .

vi. *Water export*

A large portion of the water in the Owyhee River is intercepted by Owyhee Dam and diverted to irrigation. About 85% of this water is not utilized within the lower

Owyhee subbasin but is exported for the irrigation of crops outside the subbasin in Malheur County or in Idaho.^{3,17}

3 Surface water

The majority of the surface water rights in the lower Owyhee subbasin, both from streams and springs, are for irrigation or supplemental irrigation. In addition to the rights below the dam, mostly from the Owyhee River, there is a concentration of water rights for irrigation around the Crowley area, some opposite the modern "Hole in the Ground" on the Owyhee River, three along Bogus Creek, several in the Dry Creek drainage, and the others scattered around the subbasin (Figure 6.6).

Although generally the 15,970 acres irrigated from the Owyhee Project use the irrigation water to grow crops or alfalfa hay, most of the water rights for irrigation in the upland areas of the lower Owyhee subbasin are used to grow hay for winter feed for livestock. This irrigation is usually in conjunction with a livestock operation.

There are seven surface water rights at the south end of the subbasin for livestock.

The Oregon Department of Fish and Game has applied for in-stream rights in parts of the Owyhee River above the dam for fish.

4 Wells

Most of the wells in the lower Owyhee subbasin do not require a certificate as they are used for livestock and all stockwater use of groundwater is exempt.¹²

Wells also do not require a permit from the Oregon Water Resources Department if they will be used to water a "lawn or noncommercial garden not exceeding 1/2 acre in area."¹² And, there is also a statutory exemption from permit requirements for domestic use of groundwater of not more than 15,000 gallons per day.¹²

The wells with a water use certificate within the lower Owyhee subbasin are primarily used for supplemental irrigation (Figure 6.6).

There is one permit for developing two wells in conjunction with an open pit mine. To obtain a certificate to use this water for mining purposes, the wells must be completed by October 1, 2008.¹⁰ The water from these two wells would be used in many sections of the subbasin around Grassy Mountain.

5 Fire fighting

"Water used for emergency fire fighting is exempt from permit and certificate requirements regardless of the source of water."¹²

Bibliography

1. Bureau of Reclamation. 1965. *Upper Owyhee Project, Idaho - Oregon*: Reconnaissance report. United States Department of the Interior, Bureau of Reclamation, Boise, Idaho.

2. Bureau of Reclamation. 1997. *Owyhee Project Storage Optimization Study Oregon*: Information Report. United States Department of the Interior, Bureau of Reclamation, Boise, Idaho.
3. Bureau of Reclamation. Owyhee project: Oregon and Idaho. *Dams, Projects & Powerplants: Bureau of Reclamation*. Accessed 11/10/2006. <http://www.usbr.gov/dataweb/html/owyhee.html>.
4. Bureau of Reclamation. 2006. Biological Assessment and Opinions for Operations and Maintenance of Reclamation Projects in the Snake River Basin above Brownlee Reservoir. Accessed 11/24/06. <http://www.usbr.gov/pn/programs/UpperSnake/>.
5. Decree modifying order of determination of state engineer. 1926. In the matter of the determination of the relative rights to the use of the waters of Owyhee River and its tributaries, a tributary of Snake River. In the Circuit Court of the State of Oregon for the County of Malheur.
6. Feibert, Erik B.G. and Clinton C. Shock. 2006. 2005 Weather Report. Malheur Experiment Station, Oregon State University. Accessed 11/23/2006. <http://www.cropinfo.net/AnnualReports/2005/Wthrrp05.html>.
7. Gregg, Jacob Ray. 1950. *Pioneer Days in Malheur County*. Lorrin L. Morrison, Los Angeles.
8. Jacobs, Ron. 2006. Personal communication with the watermaster.
9. Jones, Ilea and Eunice Guerrant eds. 1988. *Malheur County History*. Taylor Publishing Company, Dallas, Texas.
10. Oregon Water Resources Department. 2006. Water right information search. Accessed 11/7/2006. <http://www.wrd.state.or.us/OWRD/WR/wris.shtml> The Water Rights Information System is an online database of information pertaining to water rights. An effort has been made to make it accurate and complete, but it may contain errors.
11. Oregon Water Resources Department. 2006. Water rights platcard query. Accessed 11/7/2006. <http://apps.wrd.state.or.us/apps/wr/platcard/platcard.php>. Every section in every township in the lower Owyhee subbasin was examined for existing water rights.
12. Oregon Water Resources Department. 2006. Water use authorizations: Oregon administrative rules. Accessed 11/7/2006. http://arcweb.sos.state.or.us/rules/OARS_600/OAR_690/690_340.html
13. Stene, Eric A. 1996. The Owyhee Project. *Dams, Projects & Powerplants: Bureau of Reclamation*. Accessed 11/10/2006. <http://www.usbr.gov/dataweb/projects/oregon/Owyhee/history.html>.
14. Stunz, Gene. 2003. *Hydroelectric Power Production in the Owyhee Project -- A History*. Joint committee of the Owyhee Project, Nyssa, OR.
15. U.S. Army Corps of Engineers. 2004. Floods of 1952, Oregon and Idaho. Accessed 11/24/06. <http://www.nww.usace.army.mil/dpn/fldinfo%5Cff1952.htm>
16. U.S. Fish and Wildlife Service. 2005. Biological Opinion for Bureau of Reclamation Operations and Maintenance in the Snake River Basin Above Brownlee Reservoir. U.S. Fish and Wildlife Service, Snake River Fish and Wildlife Office, Boise, Idaho.
17. Vigg, Steven C., editor and project coordinator. 2004. Owyhee Subbasin Plan. Prepared for the Northwest Power and Conservation Council.
18. Oregon Water Resources Department. 2006. *Water Rights in Oregon: An introduction to Oregon's water laws*. Oregon Water Resources Department. Available online at: <http://www.oregon.gov/OWRD/PUBS/aquabook.shtml>