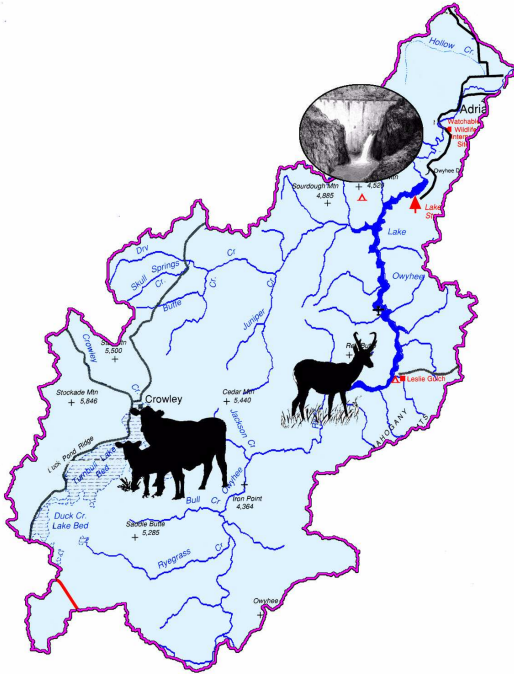


# Lower Owyhee Watershed Assessment

## I. Overview

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Ecological Services



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### I. Overview

The lower Owyhee subbasin is located in the southeastern-most corner of Oregon in Malheur county (Figure 1.1). It covers 1,268,900 acres (1,983 square miles), larger than the state of Delaware.

#### A. Climate

The identification of natural variables is an important facet in describing a watershed. The lower Owyhee subbasin is a semiarid desert. At the Rome weather station slightly south of the subbasin, the thirty year average annual rainfall is 8.28

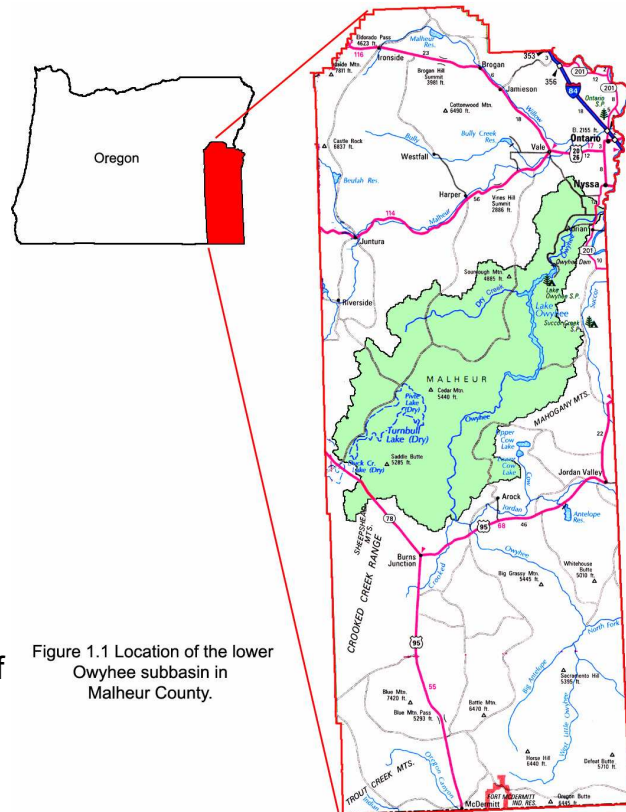


Figure 1.1 Location of the lower Owyhee subbasin in Malheur County.

inches. At the Malheur Experiment Station slightly north of the subbasin, the sixty year average annual rainfall is 10.19 inches. This scarcity of precipitation is a major determining factor in the functioning of the subbasin. The least rainfall falls in the months of July and August. The greatest precipitation is during the winter and early spring months.

The months of July and August are also the hottest. Over sixty years, the average maximum temperature at the Malheur Experiment Station in July was 92 degrees and in August 91 degrees. Rome is at a slightly higher elevation, so the average maximum temperatures there were slightly lower, 90 degrees in July, 89 degrees in August.

## **B. Geography**

The construction of the Owyhee Dam has led to two distinct parts to the lower Owyhee subbasin. Below the dam the use of the land has been transformed to irrigated agriculture. Most of the unirrigated portion of the Lower Owyhee subbasin is part of the Owyhee uplands.

### **1 Snake River plain**

The northern end of the lower Owyhee subbasin lies within the Snake River plain. This broad, relatively flat plain is thought to have originally formed by subsidence after the Yellowstone hot spot passed by the area to the south. Subsequent flooding events of the Snake, Owyhee, and other rivers have resulted in depositing layers of gravel and soil. The lower Owyhee river valley has now been substantially converted into irrigated agriculture (Figure 1.2) although previously the vegetation was largely sagebrush steppe. Much of the soil is alkaline and overlies a caliche hardpan. Most of the caliche hardpans in cultivated soils have been intentionally shattered by deep cultivation.



Figure 1.2 Irrigated agriculture in NE Malheur County, 2005.

### **2 Owyhee Uplands**

Most of the lower Owyhee subbasin lies within the Owyhee uplands. The Owyhee uplands geography is distinct from the geography of the Great Basin or the geography of the Snake River plains, sharing characteristics of both. Although the vegetation and animals of the Owyhee uplands are similar to those found in the Great Basin, the area has fewer mountains running north and south which characterize the Basin and Range topography and the Owyhee uplands has had more volcanic activity.

#### **a. Geology**

The Owyhee uplands is a region of mesa lands of southeastern Oregon, southwestern Idaho and northern Nevada that is defined by the drainage of the Owyhee River. These mesa lands are part of a plateau which slopes gradually down from the south to the north. Complex geological forces created the land underlying the Owyhee uplands plateau. The soils of the mesas are generally shallow and in some areas are stripped to bare rock by wind and water. The large expanse of the plateau has been

deeply dissected by river canyons of the Owyhee and its tributaries. This down cutting has resulted in deep, precipitous river canyons 50 to 1300 feet below the level of the mesas.

Where the layers beneath a hard cap rock of basalt or rhyolite are softer tuffs (consolidated volcanic ash), they were easily removed by moving waters and in some cases wind erosion. These geologic processes have resulted in fantastic formations of different colors in dry canyons as can be seen in Leslie Gulch (Figure 1.3), Carlton Canyon, Three Fingers Gulch, the Honeycombs, and elsewhere. These tuffaceous outcroppings can also be riddled with shallow caves. Few improved roads cross the great expanse of the high plateau. A few rafters view the canyon lands when floating down the Owyhee River by rubber raft, but very few people explore the area. Larger numbers of recreationists view the lower part of the Owyhee River and canyon lands from Owyhee Reservoir while fishing and boating.



Figure 1.3. Volcanic tuff formations in Leslie Gulch

Although most of the lower Owyhee subbasin in the Owyhee uplands drains into the Owyhee River and hence into the Columbia River system, in the southeastern corner of the subbasin there are several small playas, lakes with no external drainage. These tend to be dry lakes except in exceptionally wet years.

### **b. Hydrology**

Since the Owyhee uplands are a semiarid desert with very few sources of perennial water, the landscape is primarily dissected by intermittent drainages and ephemeral streams which flow only following rainstorms or snow melt. The erosional processes which are forming the landscape follow major storm or storm on snow events. Runoff events are aggravated when the soil is frozen. Surface water availability for grazing animals is quite low because access to major rivers is largely constrained by cliffs. Although most of the water in the drainage comes as precipitation in the winter and spring months, there are some springs in the area. Surface water has been enhanced by stock ponds, pipelines and reservoirs.

### **c. Vegetation**

Vegetative communities are shaped by the low quantities and infrequent nature of water availability. The rolling land is predominately covered with sagebrush steppe communities consisting of sagebrush (*Artemisia* spp.), scrub, and perennial bunchgrass with a scattering of annual and perennial herbs. The semiarid environment has supported sagebrush steppe/desert scrub communities for at least the last 8000 years.

### **d. Animals**

The limited availability of water determines to some extent where and what type of wildlife will be found in the area. The species present are similar to those found in surrounding regions. Large mammals of the Owyhee uplands today include pronghorn,

mule deer, white-tailed deer, elk, and cougar. Bighorn sheep have been reintroduced to the rugged canyons. Wild horses are abundant.

#### **e. *Native Americans***

The Owyhee uplands were home to the Tagötöka band of the Northern Paiute at European contact. This group's territory largely coincided with the Owyhee watershed. They were surrounded by other Northern Paiute and Shoshone bands in Oregon, Nevada and Idaho. Prior to the Northern Paiute, other groups have inhabited the Owyhees since at least 12,000 BP (years before the present).

### **C. Owyhee Dam**

The Owyhee dam is in the lower Owyhee subbasin. The Owyhee River system drains an enormous area of land, approximately 7 million acres or 11,337 square miles. Most of the precipitation falls during the winter and spring months. The runoff from this area is captured in the Owyhee Reservoir. The reservoir covers 13,900 acres and holds 715,000 acre feet of water above the minimum pool. This water is used to irrigate 110,000 acres of land and partially supply water to another 13,000 acres. Most of the water from the lower Owyhee subbasin is utilized outside the subbasin to the north in Malheur County and to the east in Idaho. About 22,000 acres in the lower Owyhee subbasin are irrigated mostly from the Owyhee project.

### **D. Population**

In the 2002 census of population, 4,187 people were shown as living in the lower Owyhee subbasin. Most of the population was concentrated on the small area below the Owyhee Dam that receives irrigation water from the dam. There are no towns in the subbasin.

### **E. Use of the subbasin**

Ninety percent of the subbasin is publicly owned land. Eighty-three percent of all land in the subbasin is rangeland and fourteen percent is hayland and pastureland. There are small areas of wetland. Three percent of the land is irrigated; two-thirds of the irrigated land is in row crops. In 2005 the NRCS recorded about 175 operations with 103 full time farmers or ranchers and 184 part-time farmers or ranchers in the subbasin.

The subbasin is used for recreation, farming, ranching, capture and distribution of water, and preservation of wildlife and native plants. The public has special interest in the lower Owyhee subbasin due to the wide diversity of uses, importance of water resources, and natural beauty.

### **F. Conclusion**

In the lower Owyhee subbasin, during the summer months the temperatures are high and the rainfall very low. The area of the lower Owyhee subbasin is mostly uninhabited rangeland. There are creeks and the Owyhee River in deep canyons and little water access on the mesas. Crops are grown on irrigated land below the Owyhee

dam utilizing water captured during spring runoff. The lower Owyhee has areas with great natural beauty, geological complexity, and diverse uses.