

Upper Owyhee Watershed Assessment

I. Overview

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I. Overview *

The upper Owyhee subbasin is located in parts of three states: the southeastern corner of Oregon, the southwestern corner of Idaho, and north central Nevada (Figure 1.1). It covers 3,175,153 acres (4,961 square miles). Parts of the subbasin lie in four different counties: Malheur County in Oregon, Owyhee County in Idaho, and Elko and Humboldt Counties in Nevada.

The headwaters of three forks of the Owyhee River are in the subbasin: Little Owyhee River, South Fork Owyhee River, and Owyhee River. The water collected by these rivers and their tributaries flows into the Owyhee River, down that river to the Snake River, and eventually into the Columbia River system.

Recognizing that the Duck Valley Tribal Council operates as a sovereign entity, this assessment does not include the reservation lands that are within the upper Owyhee subbasin.



Photo 1.1 The Owyhee River southwest of the confluence with Battle Creek in Idaho

* Consult the other sections of this Upper Owyhee Watershed Assessment for a more complete discussion of the information summarized in this overview.

A. Geography

The upper Owyhee subbasin has complex geography. It includes the Bull Run Mountains and the west side of the Independence Mountains. McAfee Peak and Jacks Peak tower over 10,000 feet. To the west, the more level Owyhee uplands gradually slope down to 4,800 feet elevation.

1. Owyhee Uplands

The majority of the upper Owyhee subbasin lies within the Owyhee uplands. The Owyhee uplands were formed by volcanic activity, some faulting, and sediment deposited by large lakes, leading to fairly flat topography.

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 majority of the rocks have an igneous or sedimentary origin in fairly recent geological history. Covering these rocks, the soils of the mesas are generally shallow and in some areas were stripped away by wind and water to expose bare rock. The mesa lands are actively, but very slowly, eroding. 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.



2. Bull Run and Independence Mountains

The Bull Run and Independence Mountains are an extension of the basin and range geological province. The basin and range was named for the north-south orientation of multiple valleys and mountain ranges. The region has grown as the Earth's crust has been stretched to the west. The extension thinned and cracked the crust as it was pulled apart, creating large faults. Along these roughly north-south trending faults valleys down-dropped and mountains were uplifted, producing the distinctive pattern of linear mountain ranges and alternating valleys of the Basin and Range province.

Photo 1.2. The canyon cliffs of the Owyhee River snake into the distance.

Geologically the rocks of the Basin and Range province are very old, Many of these rocks have been transformed by metamorphism, the process where rock under great temperature and pressures is altered from its original state. For the upper Owyhee subbasin this means that a greater variety of rocks are found within Bull Run

and Independence Mountains than in the Owyhee uplands. Additionally many soils on the mountain slopes are older and more highly developed than those on the mesa lands.

B. Climate

As the topography of the upper Owyhee subbasin varies, so does the climate. The measured rainfall at the few weather stations within the subbasin varies from an average annual rainfall of 12.6 inches at the Tuscarora weather station to 15.8 inches at the North Fork 7NW station. However, at some higher locations greater rainfall is expected. The scarcity of precipitation is a major determining factor in the functioning of the subbasin. The least rainfall occurs in the months of July and August.

The months of July and August are also the hottest. The average maximum temperature at the weather stations varied from 80.8 to 88.1 in July and from 75.5 to 87.4 in August. The lowest average July and August temperatures were at North Fork 7NW, the station at the highest altitude, 6,600 ft; whereas the highest temperatures were at the station at the lowest altitude, I-L Ranch at 5,200 ft..

C. Hydrology

The South Fork of the Owyhee River is fed by runoff from the west side of the Bull Run and Independence Mountains. The Owyhee River (also identified as the east fork) captures water from the east side of the Bull Run Mountains. Wildhorse Reservoir on the Owyhee River holds runoff from the northern portion of the east side of the Independence Mountains. The southern portion of the east side of the Independence Mountains drains into the Humboldt Basin. Much of the water which flows east from the mountains into the Owyhee River is utilized before it reaches the Idaho portion of the subbasin beyond the Duck Valley Reservation.

Snow which accumulates on Mud Flat in the upper Owyhee subbasin melts in the spring and flows down Deep and Pole Creeks. Although years vary considerably, on average it provides 35 to 40 percent of the water which eventually flows into the Owyhee Reservoir.

Since the Owyhee uplands are a semiarid desert with very few sources of perennial water, many canyons in the landscape have been formed by intermittent drainages and ephemeral streams which flow only following rainstorms or snow melt. The erosion which continues to create the landscape is episodic; most erosion occurs during major storm or storm on snow events. Runoff events have a greater impact when the soil is frozen because little of the water is absorbed by the soil. The availability of surface water to 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 a few springs. Surface water availability has been enhanced by stock ponds, pipelines, and reservoirs.

D. Vegetation

Across the rolling lands of the Owyhee uplands, vegetative communities are shaped by aridity, the low quantities of water and the infrequent nature of its availability.

The 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.

In the deeper valleys and on the north slopes of the Bull Run and Independence Mountains, vegetative communities transition to pinyon/juniper around 6,000 feet. Within the pinyon/juniper, primary vegetation other than juniper consists of curl-leaf mountain mahogany, snowberry, and ceanothus. At higher elevations there are western hardwood and mixed deciduous/coniferous forests. Aspen and mountain mahogany may be mixed with whitebark pine, Douglas-fir, limber pine, Engelmann spruce, subalpine fir, or bristlecone pine.

Along the western border of the watershed, the south slope of Juniper Mountain above 5,000 feet elevation also has pinyon/juniper forest. The mountains west of Tuscarora have patches of pinyon/juniper above 6,000 feet on the western slopes and at higher elevations western hardwoods.

E. Animals

The 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 upper Owyhee subbasin today include pronghorn, mule deer, white-tailed deer, elk, and cougar. Bighorn sheep have been reintroduced to the rugged canyons. Wild horses, introduced to America by the Spanish in the 1500s, roam the uplands.

F. Native Americans

At the time of Euro-American contact, the upper Owyhee subbasin contained parts of the territories of the traditional Northern Paiute, Western Shoshone, and Northern Shoshone groups. Prior to these tribes occupying the area, other groups had inhabited the Owyhees since at least 12,000 BP (years before the present).

G. Population

In the 2000 census of population, 447 people were shown as living in the area of the upper Owyhee subbasin outside Duck Valley Indian Reservation. Another 1,265 people were living on the reservation.

H. Access

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. A paved highway, Idaho 55 - Nevada 225, traverses the subbasin to the east of the Bull Run and Independence Mountains. Two improved roads cross the mountains to Nevada Highway 226 which runs to the west of the mountains.

I. Use of the subbasin

Small patches of the upper Owyhee subbasin are privately owned or state lands. The remainder is federal land administered by the Bureau of Land Management or the National Forest Service.

The majority of the subbasin is rangeland and is grazed by cattle. For winter feed, hay is grown on irrigated land to the west of the Bull Run and Independence Ranges, utilizing water captured during spring runoff. Ranching in the subbasin is conducted both by ranchers living on the land and by ranchers whose primary home is outside the watershed.

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



Photo 1.3. Clockwise from upper left hand corner: a mountain meadow in the Bull Run Mountains, grasslands on the plateau below Juniper Mountain, in the Independence Mountains, spring flowers near Wildhorse Reservoir, looking west across the Owyhee uplands from the foothills of the Independence Mountains, near the upper end of Deep Creek in Idaho, wild horses leaving a watering hole in the Oregon section of the upper Owyhee subbasin.

J. Conclusion

During the summer months in the upper Owyhee subbasin, the temperatures are high and the rainfall very low. Most of the upper Owyhee subbasin is uninhabited rangeland. Creeks and the Owyhee River run in deep canyons with little water access on the mesas. The water which leaves the subbasin continues downstream through the rest of the Owyhee basin, eventually joining the Columbia River. The upper Owyhee has areas with great beauty, geological complexity, and diverse uses.