

Upper Owyhee Watershed Assessment

XI. Watershed Condition Evaluation

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Contents

- A. Evaluation of watershed condition
- B. Discussion
 - 1. Invasive species
 - 2. Rangeland
 - 3. Riparian
 - 4. Hydrology
 - 5. Mercury and other legacy mining minerals
 - 6. Federal ownership of the land
 - 7. Recreation
- 8. Private ownership
- C. Large gaps in data
 - 1. Hydrology
 - 2. Rangeland
 - 3. Riparian
 - 4. Fish
 - 5. Water quality
 - 6. Wildlife
 - 7. Wilderness areas
- D. Conclusion

The Oregon governor's strategic initiative for ensuring sustainable water resources for Oregon's future, Headwaters 2 Ocean, considers all water resources from the hilltops to the Pacific Ocean. The completion of the assessment of the upper Owyhee subbasin is consistent with the governor's initiative. The upper Owyhee subbasin contains the headwaters of the Owyhee River and two of its principal tributaries, the South Fork Owyhee River and the Little Owyhee River.

XI. Watershed condition evaluation

To evaluate the condition of the upper Owyhee subbasin, it is necessary to look at all of the interacting factors within the ecosystem. The subbasin has changed since the first Native Americans took up residence here at least 13,000 years ago. There have been changes in climate, changes in population densities, and changes in the effects of humans on the ecosystem.

Native American inhabitants of the region modified the environment. The pre-European land use practices affected the abundance of game and promoted the propagation of economically important plant species. With the arrival of Euro-Americans and with advances in technology, the types of modifications to the environment have changed and are continuing to change. These more recent modifications can be considered both beneficial and harmful.

Ecosystems are dynamic. The ecosystems of the upper Owyhee subbasin have changed from what they were before the Spanish introduced horses and European diseases to the western hemisphere. They have changed from what they were at the time of Euro-American contact, and they have changed from what they were at the turn of the last century.

Some things have remained relatively constant over the last two hundred years. The upper Owyhee subbasin is still an arid to semi-arid desert with little water and less runoff. The land is geologically very young so soils are not well developed. The combination of poor or nonexistent soils with a lack of water has meant that the human population of the area has remained low.

The tremendous geological and erosive forces which shaped the landscape in the more distant past have been relatively inactive in the recent past. Unchanged by bulldozers and subdivisions, the natural beauty of the landscape has not been spoiled.

A. Evaluation of watershed condition

The upper Owyhee subbasin occupies a large, sparsely populated area. There is a paucity of data about many aspects of the region, both as it may have existed before Euro-American entry into the region and as it exists now. Many of the unknowns, or data gaps, have been enumerated in the other sections of this assessment.

There are some conclusions which can be made from the data which is available.

The upper Owyhee subbasin has complex geography. It varies in elevation from 4,800 feet to over 10,000 feet. The parent materials are from widely different geological origins. There is a resulting diversity across the subbasin in local hydrology, native vegetation, land use, and other characteristics.

A landscape that was devoid of trees except in the Bull Run and Independence Mountains at the time of Euro-American contact now has trees growing along parts of many of the streams and rivers.

Large game, extremely scarce at the time of Euro-American contact, now roam the Owyhee uplands.

Over grazing in the late 1800s and early 1900s left broad expanses of rangeland largely denuded and unprotected from erosive events. Grazing management has led to renewed vegetative cover on most of these rangelands.

Hundreds of species of native plants still grow in the upper Owyhee subbasin. Native animal species can be observed in all areas.

Water developments throughout the subbasin have increased the availability of water to both livestock and wildlife.

The potential expansion of tamarisk poses one of the greatest threats to the continued availability of water originating within the upper Owyhee subbasin. This would affect wildlife, riparian areas, and downstream uses. Additional weed species and juniper are poised to expand within the watershed.

Further off-stream water developments are needed to remove livestock from some riparian areas during times when the riparian vegetation would be sensitive to grazing pressure.

The expansion of agriculture on the western side of the Bull Run and Independence Mountains in Nevada has led to the channelization of streams in the area, including long reaches of Bull Run Creek.

B. Discussion

We cannot know what the condition of the watershed would be in the absence of humans. The geology and climate affecting the area would be little different, although even the climate may be changing due to the activities of people elsewhere in the world.

1. Invasive species

In comparison with other areas of the Owyhee watershed, the upper Owyhee subbasin has a lower incidence of invasive species.

Evolution occurs slowly over time. The native plant stands of the rangelands and riparian areas in the upper Owyhee subbasin evolved with grazing pressure,¹ without nonnative invasive species, and with periodic fires. Now there are invasive species, a low fire frequency, and in some areas the absence of grazing. Native plants are not adapted to compete well under the changed conditions.

Major efforts are needed to halt and reverse the spread of invasive species. Many of the invasive species are just obtaining a toehold and need to be stopped while treating them is still relatively easy. Newer, less dangerous herbicides with shorter half lives are being successfully used by ranchers cooperating with the Jordan Valley Cooperative Weed Management Area. The continued spread of invasive weed species will result in a degraded, non native environment without the vegetative community which was (and in many places still is) an important component of the ecosystem. The whole web of native insect and higher animal life depends on the continued vigor of native plant species both on the rangeland and in riparian areas.

Tamarisk is known to be present along both the South Fork Owyhee River and the east fork Owyhee River (Figure 7.3). It is still relatively infrequent. These isolated occurrences pose a serious threat by providing a source of seed which can both spread and expand the population around the existing plants and disseminate seed downstream where it can establish new colonies along the banks of the river. A program now to eliminate the existing plants could significantly avert undesirable effects resulting from decreased water production. The use of biological controls of tamarisk has been severely limited by court cases.

Although halogeton occupies large stretches of the center of the road in the southwest corner of Owyhee county, it has obviously been in the area for quite some time since the area to the east of the Little



Photo 11.1. Tamarisk in bloom.



Photo 11.2. Halogeton on the left hand side of the road. Little Owyhee River Canyon in the background.



Photo 11.3. A well established halogeton plant.

Owyhee River is named Halogeton Flats. And yes, the flats are contaminated with halogeton.

Management of invasive species may be the most time sensitive issue for maintaining healthy watershed conditions.

2. Rangeland

The rangeland of the upper Owyhee is extensive. Some of the range is in great shape with a mix of perennial forbs, grasses, and shrubs. There are large areas that have sparse vegetation but have about as much vegetation as the climate and soil will support.

There is an area of the upper Owyhee subbasin in southeast Malheur County and southwest Owyhee County along the border with Nevada which is overstocked with woody vegetation. There are very few forbs or grasses, either native or introduced, in the understory. In July 2010, there were no signs of grazing. The excessive growth of sagebrush may be the result of a long period with systematic fire suppression or with no fires.



Photo 11.4. Rangeland overstocked with woody vegetation in southwest Owyhee County

3. Riparian

The riparian areas in the steep-sided, deeply incised

canyons of the Owyhee River and the South Fork Owyhee River are in close to pristine condition. There is limited access to these areas for large wildlife, cattle, or most humans.

The elimination of most of the beaver by trappers in the early 1800s changed the hydrology of the upper reaches of streams. We do not know the extent of changes in the associated riparian vegetation. The early trappers noted that much of the riparian system in the upper Owyhee subbasin was useless for trapping beaver. The confined nature of the streams and their routine scouring rendered them inappropriate for support of beaver.

4. Hydrology

The river flows in the upper Owyhee subbasin vary significantly from year to year. Occasionally there may be a larger volume of flow in one day than the total volume for the driest years. The upstream water impoundments have had a slight mitigating effect on the “flashy” nature of the flows.

Exceptionally large flows, especially when accompanied by ice, are responsible for removing riverside vegetation, transporting sediment, and causing stream bank erosion.

5. Mercury and other legacy mining minerals

Much of the mining activity in the upper Owyhee subbasin ended at the end of the nineteenth century or early in the twentieth century. The individuals or companies responsible for any lingering pollutants are no longer around and can not be held accountable for cleanup. Private individuals and local governments do not have the economic resources to contain the sources of any legacy pollutants which continue to flow into the streams of the upper Owyhee subbasin. Federal and state agencies need to be actively involved in preventing the ongoing and future contamination and eliminating this threat to the water quality.

6. Federal ownership of the land

The major portion of land in the upper Owyhee subbasin is federal land. With a small tax base, it is a hardship on the counties and other local agencies to provide services to this vast area.

The BLM has served as the steward of much of the land in the upper Owyhee subbasin. Much of the past recuperation of degraded areas of rangeland was accomplished with BLM support and oversight. However, the public land is managed by bureaucracy and bureaucracies are frequently slow in responding or unresponsive to local needs.



Photo 11.5. Looking down from steep canyon walls on riparian vegetation along the Owyhee River.

7. Recreation

Growing population in SW Idaho and elsewhere is increasing the use of the area for recreation. This use today tends to be concentrated in the more easily reached areas. Recreationists do not necessarily have conservation ethics and may leave behind trash, human waste, and scars upon the landscape. New roads appear where recreationists don't respect the fragility of the landscape. Some individuals lack respect for private property and fences, especially during hunting season.

Some recreationists may not be prepared for the conditions in the high desert. A lack of experience may result in catastrophic ends to a trip. Inexperience may lead to not realizing how unmaintained roads may have become impassable or to being unprepared for unexpected delays in a remote area with no cell phone access and carrying inadequate provisions such as water, jackets, and spare tires. Counties or other public agencies can be forced to expend huge resources looking for lost individuals who have failed to leave clear indications of where they are going.

Despite the increased use of some areas, a large portion of the beautiful places within the subbasin are seldom visited.

8. Private ownership

Although only 6.5% of the land in the Idaho section of the upper Owyhee subbasin is private, 18% of the total stream miles are on private property. These private lands "are usually the most productive areas".² The private land water rights are essential to being able to productively use the federally owned rangeland.

The land in the upper Owyhee subbasin in Idaho is not particularly attractive to investors to hold speculatively. However, the purchase of these holdings by entities intending to acquire the associated grazing rights can have detrimental consequences if the purpose is to leave the BLM land ungrazed. Land removed from use will have less management and day-to-day oversight with a greater potential for the spread of invasive weeds and juniper.

Speculative investments in land can raise the price of property and greatly restrict attempts by young people to maintain the traditions of family farming and ranching.

C. Large gaps in data

Much basic information about the conditions within the upper Owyhee subbasin is lacking and there is a very poor understanding of the ecological interactions in the subbasin. These data gaps and unknowns have been enumerated in the other sections of this assessment. A few of these are highlighted here.

1. Hydrology

There is a popular misconception that published maps showing flow lines are showing streams.

There has been no ground verification of which streams in the upper Owyhee subbasin are ephemeral, intermittent, or perennial. Since the USGS maps do not

distinguish between intermittent and ephemeral streams, ground surveys are necessary to make these determinations. In the upper Owyhee subbasin this information is not available for most drainages. The three stream types can not be evaluated in the same fashion and have dissimilar responses to restoration efforts. Intermittent streams are those which flow for only certain times of the year, when they receive water from springs or runoff. During dry years they may cease to flow entirely or they may be reduced to a series of separate pools. Ephemeral streams only carry water during and immediately after runoff events.

2. Rangeland

We do not understand the impact of juniper expansion on watershed function and water resources. Likewise, we don't know how watershed function and water resources are affected by the conversion of rangeland vegetation to invasive annuals.

What effect will rangeland overstocked with woody shrubs have on watershed function?

Studies are needed on ways to restore native perennial vegetation to rangelands. Is there an acceptable ratio of cheatgrass to native plants where the ecological processes of rangeland still function? We have little information on the response of different vegetative communities to livestock grazing, timing of the grazing, or removal of grazing. Can the removal of livestock accelerate conversion of rangeland to cheatgrass or other invasive species?

Has a lack of fire resulted in overstocking of some areas with sagebrush and a concomitant decrease in grass and forbs essential to wildlife and grazing? Does a predominant sagebrush cover change runoff and erosion processes?

3. Riparian

In the upper Owyhee subbasin, the potential of riparian areas based on physical, biological, and chemical conditions is not known. The site specific physical, biological, and chemical conditions of riparian areas have not been surveyed. The management practices that will result in maintaining, restoring, improving, or expanding riparian areas in the upper Owyhee subbasin are poorly defined.

Some areas identified as lakes with wetlands appear to only occasionally become temporary lakes. Although they may support special sage species more tolerant to water scarcity, they are not wetland bird habitat (e.g. Lookout Lake).

Seasonal observations of suspected and known riparian habitats will be necessary to learn about fluctuations in the natural water flows from floods to intermittently available water. Understanding seasonality in available water will be essential to management decisions and expectations of rehabilitation.

4. Fish

There have been no studies of the interactions between the species of fish in the upper Owyhee subbasin. Little is known about the distribution of each specie within the subbasin. There is extremely little information on the non-game fish populations, fluctuations in their populations, or reasons for the fluctuations.

There are many introduced fish species in the upper Owyhee subbasin. How do the nonnative fish compete for food and habitat with the native fish? What effects are the hatchery trout stocked into the subbasin having on the native redband trout populations?

5. Water quality

In the upper Owyhee subbasin, the relative contribution to stream heating from solar radiation, from the air, from the ground, and from cliffs have not been described.

Even though water quality criteria are in place, the basic information is lacking on site response to climate, hydrology, geology, soil, slope, plant and animal communities, and other environmental features needed to develop water quality criteria for the upper Owyhee subbasin.

There are no data or models that show that the current water quality temperature criteria are consistent with the thermal potential of the streams in the upper Owyhee subbasin. How will new water rights in Idaho and Nevada which will reduce stream flows affect probable, but unknown, increases in downstream temperatures?

No comprehensive survey has been done to precisely locate possible sources of mercury, arsenic, or other pollutants in the upper Owyhee subbasin nor to identify geologic locations in the upper Owyhee subbasin that have mercury or arsenic concentrations which might contribute to mercury or arsenic in the river system if the sites become disturbed in the future.

6. Wildlife

The interactions between different wildlife species, introduced wild horse populations, and cattle are poorly understood including forage preferences and usage over the year. Few studies are available pertinent to the upper Owyhee subbasin on the effects of specific ranching practices on forage for wildlife.

How many cougar and wolves are actually in the upper Owyhee subbasin? At what level do these predator populations significantly affect wildlife populations and ranching?

How are wildlife populations being influenced by the expansion of weeds? How would wildlife populations be affected by the elimination of any of the stock ponds?

7. Wilderness areas

We do not know how designation of wilderness areas will affect fire management, watering sites, or the control of invasive species. Have some of the invasive species already become widespread and established enough that, without management, they will continue to spread, eliminating the very diversity of native vegetation that should exist in a preserved area?

Will uncontrolled burns, typical management of wilderness areas, or controlled burning, possible in managed range, best promote native vegetation and limit erosion?

D. Conclusion

The people who made their living in the upper Owyhee subbasin through the 1930s were exceedingly poor. They utilized whatever resources they could. The stewardship of the land, both private and public, has greatly improved since the 1930s.

Valuable information developed in other regions can be applied to some extent to future decision making processes affecting the upper Owyhee subbasin. However, because of the relative isolation and low potential productivity, much of the specific information necessary to make informed decisions about future actions has not been developed. Generalizing from other areas without the locally developed information can lead to decisions guided by misinformation resulting in possibly disastrous consequences to the ecological integrity of the upper Owyhee subbasin.

Local information needs to be developed so that future choices can be based on facts and the best scientific knowledge available. Decisions need to be guided by what is best for the ecology of the subbasin and the people that it supports, not by a political agenda. Uncontrolled increased exploitation of resources or complete abandonment of use are both ecologically untenable.

The upper Owyhee subbasin contains many areas of natural beauty. The people of the area have been able to work together to solve many problems. The coming changes in climate and the world economy can not be foreseen, but the upper Owyhee subbasin contains individuals who will continue to cooperate to solve local challenges.

References

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