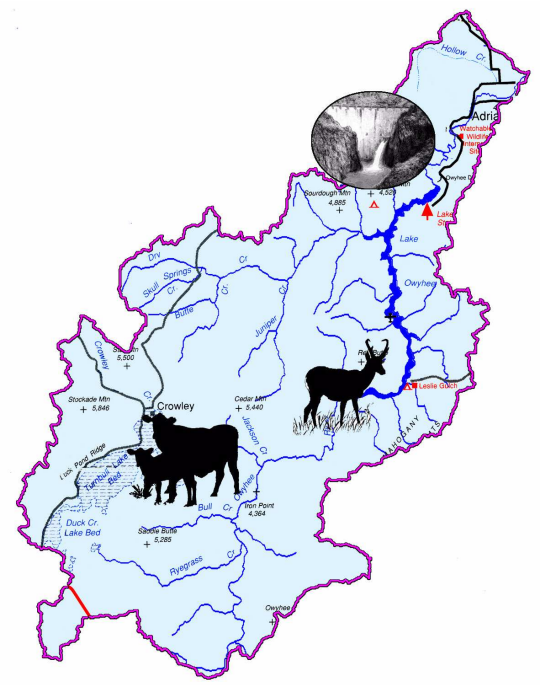

Lower Owyhee Watershed Assessment

XI. Riparian/wetlands and channel habitat type

Contents

XI. Riparian/wetlands and channel habitat type

A. Riparian

1. What is a riparian zone?

A riparian zone is an area that supports vegetation requiring more moisture than the adjacent uplands. In arid and semiarid regions, riparian areas exist in the narrow strip of land along the borders of creeks, rivers, or other bodies of water where surface water influences the surrounding vegetation.[3,8,10,16]

Riparian ecosystems exist between the uplands where there is seldom standing water and the stream, river, or lake where free flowing or standing water is common. Riparian zones have nearly unlimited variations in hydrology, soil, and vegetation types. There are different interactions between the topography, soil, geology, elevation,

hydrology, vegetative cover, evapotranspiration, animal use, and alterations by people. Consequently riparian zones vary considerably and may be difficult to delineate.[3,8,11,15,16]

Because of the proximity of riparian zones to water, the plant species are considerably different from those of the drier surrounding areas (Figure 11.1). Riparian zones are generally more productive in terms of plant biomass and are a critical source of diversity in rangelands. They create well-defined habitat zones but make up a minor proportion of the overall area in arid-land watersheds. Riparian plant communities are disproportionately important in southeastern Oregon and the lower Owyhee subbasin, but there is "probably less known about them"[3] than other plant communities. They represent an extremely significant component of the overall landscape although less than 0.5% of eastern Oregon rangelands are occupied by riparian areas (Figure 11.2).[3,8,10,11,12]

Figure 11.1. Photo along the Owyhee River in the lower Owyhee subbasin showing how riparian vegetation is very different from the surrounding upland vegetation.

2. Why are riparian areas important?

The vegetation in riparian areas affects the hydrology of the ecosystem. During high stream flows, water can be stored in the adjacent soil and in ponds, lessening the destructive effects of downstream flooding. The stored water can be a source of groundwater recharge, helping maintain stream flows later into the season.[8,15]

Stream banks with well developed riparian vegetation are less prone to erosion. The roots of riparian vegetation stabilize the soil. Water slowed by riparian vegetation has less power to erode the stream bank. Also, slower water will carry less sediment and sediments from floodwaters may be deposited in riparian vegetation.[8]

Riparian vegetation filters water both before and after it reaches a stream, removing sediments and nutrients, providing clean water and building up the soil.[8,11]

Abundant forage, water, and wildlife habitat attract a greater amount of use of riparian zones than proportional for their small land area. In addition to providing habitat for fish and wildlife, riparian areas in eastern Oregon provide scenic beauty. They are disproportionately important for many other uses (Figure 11.3). They provide opportunities for hunters, fishermen, and birdwatchers. Recreationists concentrate their use in and along such areas. Riparian zones tend to have relatively gentle topography which makes them attractive locations for roads. Frequently, stream margins are highly productive forage sites. Cattle concentrate in riparian areas not only to drink, but because of the shade, relatively gentle topography and vegetation that remains green after upland forage dries.[8,11,12,16,17]

Figure 11.2. Riparian vegetation at Hole in the Ground restricted by annual scouring and limited soil.

3. Importance to wildlife

The riparian zone is the most important wildlife habitat type in managed rangelands and is used more than any other type of habitat. Of course aquatic species such as fish and amphibians use the water in these zones, but many other semi-aquatic animals, such as waterfowl and muskrats, are found only in riparian zones. Riparian areas are critical to the life cycles of many other wildlife species.[8,12]

Stream side vegetation is also extremely important in the food chain. The organic detritus is a food source for aquatic organisms. The vegetation is an important habitat for terrestrial insects that form part of the diet of many bird and fish species.[8]

In southeastern Oregon 80% of non-bird wildlife species are directly dependent on riparian zones or use these areas more than other habitats.[11] Wildlife

Figure 11.3. There are many different uses for riparian zones. Owyhee Watershed Council 5th grade field day, 2005.

habitat consists of food, cover, and water. Riparian areas offer water. Many riparian zones also provide an unusually large part of forage for big game as well as livestock.[12]

Because riparian zones are a transitional zone, there are often several changes in vegetation between the wetland and the land with no subsurface water. This provides a number of different microhabitats so that there is a large diversity of breeding and forage sites. Some of these microhabitats tend to be more humid with more shade. Some wildlife species including deer and elk are attracted by the microclimate produced by the vegetation.[8,12,15]

Every riparian zone has different site attributes, but riparian zones are important to wildlife for many reasons.

4. Vegetation

Riparian plant communities are complex and highly variable in structure, number of species, species composition, productivity, and size. Plant species adapted to the upland may be unable to grow near river channels because they can't tolerate continuously wet soil and similarly species adapted to the river environment usually will not tolerate drier, less frequently flooded sites. Many riparian species must tolerate complete inundation some years or soil that may dry out completely other years, and sometimes both within the same year. [3,6,11,16]

Streams vary considerably over the course of a year and from year to year. Vegetation in riparian zones is even more variable than streams. There is not only a greater availability of water to plants, but frequently there are deeper soils. This leads to a great diversity of plant species. Riparian communities include many combinations of grasses, forbs, shrubs, and even trees. The density of the vegetation varies considerably. In similar environmental settings in southwestern Idaho at least 34 different riparian plant communities have been identified.[2,3,5,6,11,12]

Willows are the common woody riparian species in the lower Owyhee subbasin. The coyote willow (Figures 4.3 and 11.4) is an upright, deciduous shrub which is generally about 12 feet tall and about 15 feet wide. It grows along creek bottoms, both on the shoreline and sometimes in the water. Coyote willow forms dense thickets of pure, even-aged shrubs. Short-lived, they are threatened by both fire and drought. They can not survive long if the water table becomes too low.[21,22] Sedges and rushes are common herbaceous riparian species.

These species are well adapted to riparian areas. Numerous growing points and stems allow water to flow through a plant. A high density of roots or underground stems (rhizomes) which form a dense mat protect the stream bank from erosion and contribute to steam bank stability during high water.[2,11,15]

The dramatic contrasts between the plant communities of the riparian zone and the general surrounding upland range vegetation adds to the visual appeal.

Figure 11.4. Willows growing in Three Fingers Gulch in the lower Owyhee subbasin.

5. Proper functioning

A properly functioning riparian area will have adequate vegetation to filter sediment, to stabilize the stream bank, to protect the stream bank from erosion, to store and release water, and to recharge the aquifer. A properly functioning riparian area along a perennial stream would result in some of the following characteristics: late summer stream flows, high forage production, good water quality, and vegetation and roots that protect and stabilize the banks. It would provide shade, cooler water, good fish habitat, and a high diversity of wildlife habitats.[1,7,10]

6. Fragility

Since riparian zones occupy relatively small areas, they should be considered vulnerable to severe alteration. The distinctive vegetative community is important to the ecology of the whole region. There are many activities that can impact riparian areas.[1,12,16]

Indiscriminate recreational use can seriously disturb or destroy habitat in riparian zones. In riparian zones, recreational use per unit area is many times that for other vegetative communities.[1,12] The authors of this assessment has seen all terrain vehicle (ATV) damage in the riparian area along the Owyhee River in an area closed to ATVs. Campgrounds in riparian zones increase the opportunity for viewing wildlife but decrease the effectiveness of the riparian zone as wildlife habitat due to the "disturbance by humans, trampling, soil erosion, compaction, and loss of vegetation."[12]

Figure 11.5. Cattle in a riparian area in the lower Owyhee subbasin.

Figure 11.6. Bank erosion along a riparian area in the lower Owyhee subbasin.

The increased presence of vehicles and people on existing roads along riparian zones affects how wildlife use the area. New road construction in riparian zones will alter the size of the zone and of the vegetative community. It may impact water quality and alter the microclimate, destroying wildlife habitat. Road maintenance can disturb riparian areas.[1,12]

The U.S. Forest Service has identified the major factors affecting riparian areas in the Owyhee River basin as livestock grazing, floods, and dams.[16] There are some areas of the lower Owyhee subbasin where livestock grazing continues to affect riparian areas (Figure 11.5). Continuous or intensive grazing of riparian zones may alter vegetation with a reduction in plant productivity, a change in the plant community, or the encroachment of dry land vegetation. The change may result in a lack of adequate vegetation for bank protection and sediment filtering. The resulting erosion may lower the streambed and change the adjacent water table. Cattle in an eroded streambed may create further bank erosion with "hoof shear" (Figure 11.6).[1,3,12,15]

Management actions such as fire suppression may also alter riparian areas.[15]

7. Riparian areas in the lower Owyhee subbasin

Figure 11.7 shows riparian areas in the lower Owyhee subbasin identified by the Bureau of Land Management (BLM) in the Southeastern Oregon Regional Management Plan [1] and a few other known riparian areas. No study has identified the riparian areas on private lands.

There are probably other small riparian areas in the lower Owyhee subbasin which are not mapped. However, since riparian areas only exist where there is some connection to the water table, these will primarily be along perennial streams (see figure 5.7 in the hydrology component of this assessment). Some intermittent streams, such as Dry Creek, may also have riparian areas. However, the majority of the non-perennial stream reaches in the lower Owyhee subbasin have not been evaluated as to whether they are ephemeral or intermittent.

Sagebrush dies when flooded. Sagebrush does not tolerate saturated soil, and if the soil stays saturated for two weeks, sagebrush dies. Spreading water across sagebrush land for two weeks is a well known method of sagebrush control, since the root systems die from lack of aeration.[9] Stream channels that have sagebrush well

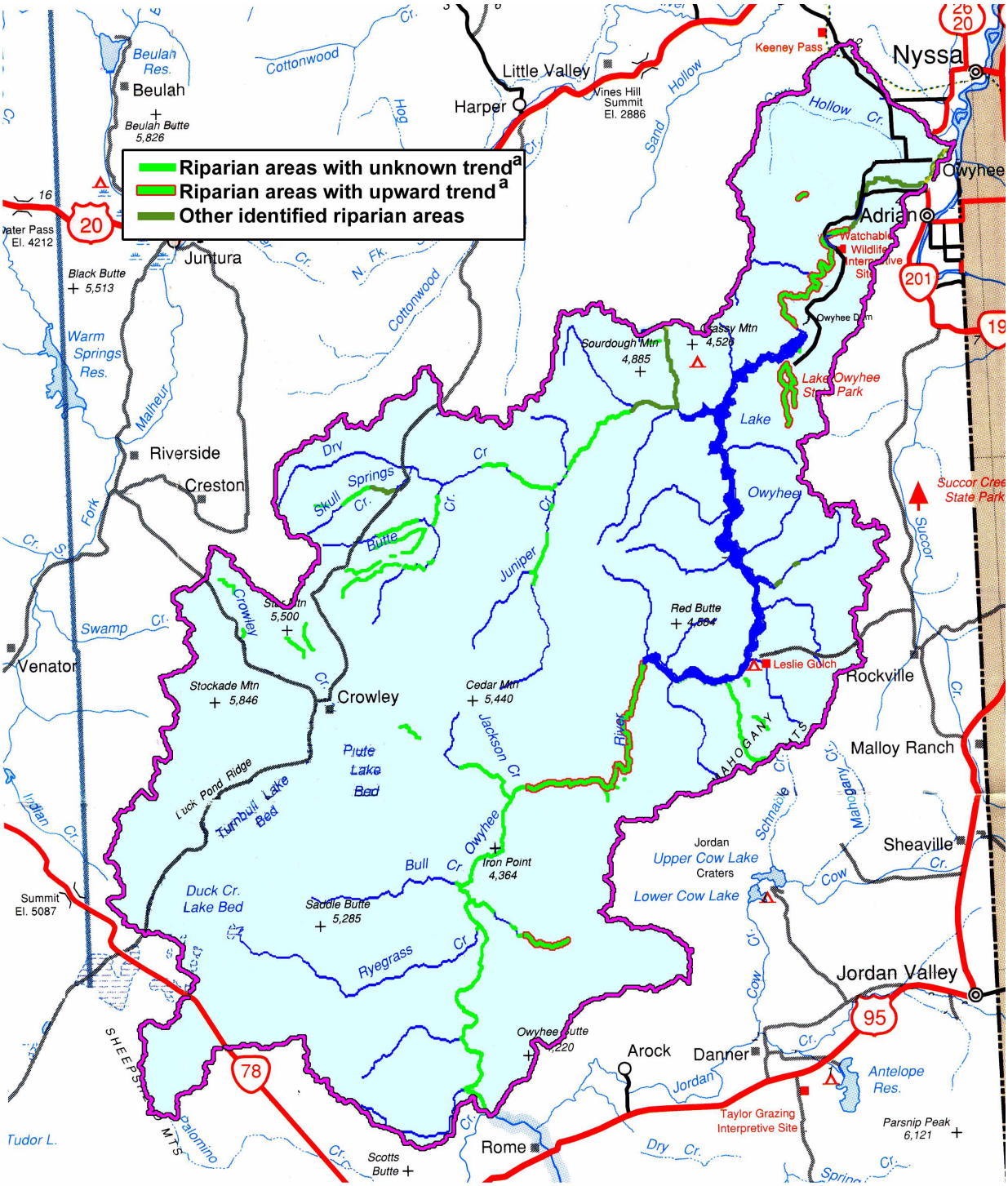

Figure 11.7. Known riparian areas in the lower Owyhee subbasin.
[a] noted in the Southeastern Oregon Resource Management Plan.[1]

developed growing directly in the bottom of the wash are not connected to the water table and are ephemeral and will not support riparian vegetation (Figure 11.8). However, sagebrush seedlings can germinate and begin growing where they can't survive subsequent flooding.

8. Wild and scenic rivers

Figure11.8. An ephemeral stream that will not support riparian vegetation. Note mature sagebrush growing in the water course.

The Owyhee River from the southern border of the lower Owyhee subbasin to the Owyhee Reservoir is designated as a wild and scenic river by the federal government. The Owyhee River from Crooked Creek to Birch Creek is designated as an Oregon State Scenic Waterway. The Vale BLM has recommended that portions of Dry Creek be designated as a wild and scenic river.[1] The section of the Owyhee River below the Owyhee Dam has also been recommended by the Vale BLM for wild and scenic river designation for its recreational value (Figure 11.9).[1]

Some sections of a wild and scenic river may contain riparian areas, other sections will not have riparian areas.

9. Invasive species.

Tamarisk (or salt cedar) is rapidly expanding in the lower Owyhee subbasin. The Bureau of Reclamation and the Owyhee Irrigation District cooperated to spray herbicide around Owyhee Reservoir for a number of years. They quit spraying about 20 years ago. Tamarisk is now advancing up a huge number of the draws from the reservoir.

A single tamarisk plant can use up to 200 gallons per day of water in the summer time. This prolific use of water can dry out riparian areas. It mines salts from the soil profile and redeposits them on the surrounding soil, rendering those areas unable to support plant species that cannot tolerate saline conditions. Tamarisk can out compete native riparian trees and shrubs. Tamarisk has very prolific seed production, grows very rapidly, and sends roots down deep. It provides very poor stream bank stabilization and erosion control.[18,19,20]

There are two to three hundred acres of tamarisk at the old Watson town site. It has become established along the Owyhee River, Dry Creek, and BLM's Areas of Critical Environmental Concern at Leslie Gulch, the Honeycombs, and in other associated wash bottoms. Large tamarisk plants in the drainages from Leslie Gulch and Three Fingers Gulch into the reservoir are surrounded with hundred of smaller plants and a green carpet of germinating seedlings. The Owyhee River below the dam is bordered by numerous spots with tamarisk plants (Figures 11.10, 11.11, and 11.12). It has begun to show up at some remote (from the river corridor) springs and intermittent streams.[18,19]

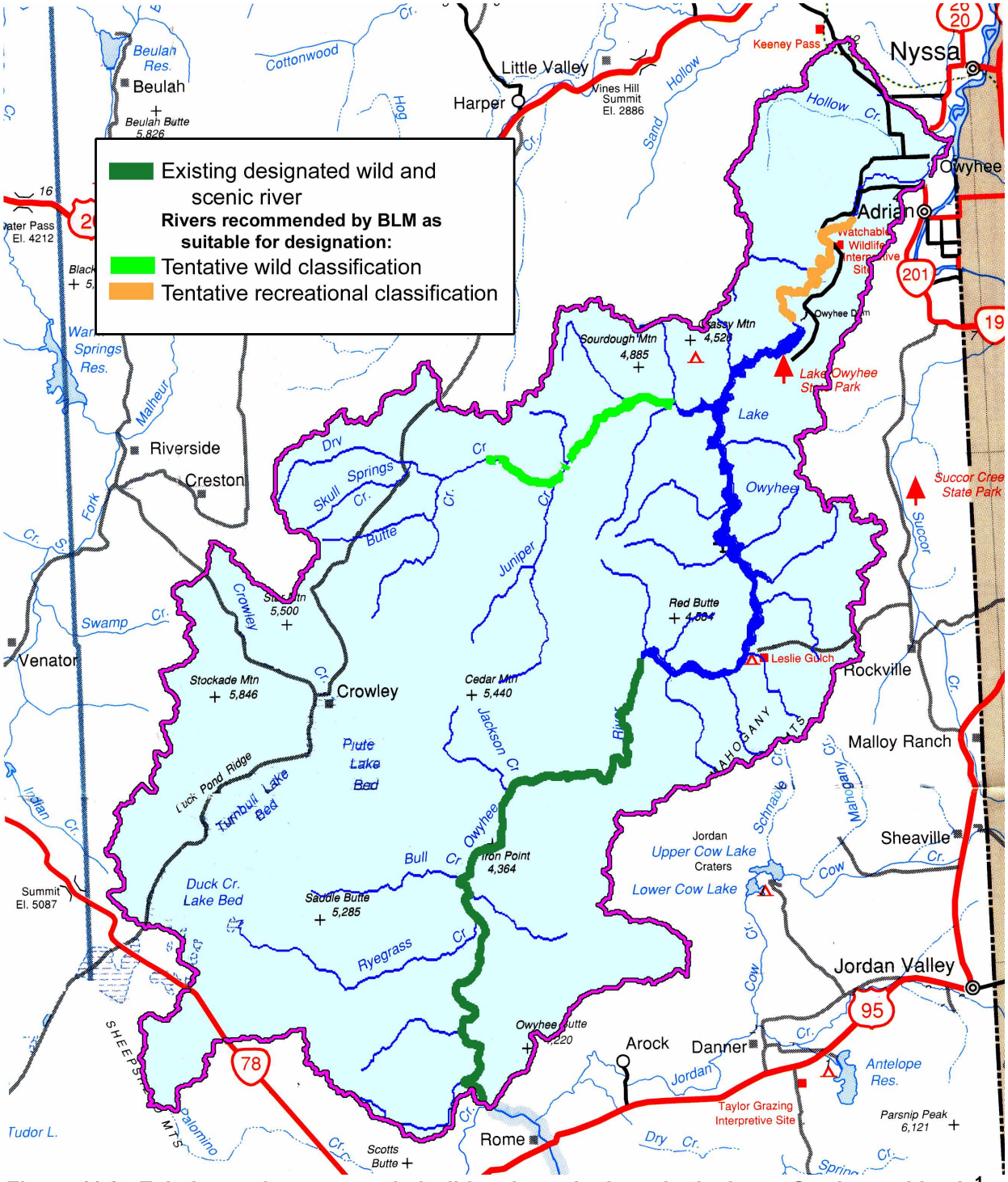

Figure 11.9. Existing and recommended wild and scenic rivers in the lower Owyhee subbasin.[1]

Tamarisk could be controlled today, but it is poised to replace native riparian vegetation. There is a the high probability that expanded salt cedar will limit the ground flow of water which will obviously affect water for wildlife and push some species toward extinctions.[18,20] Insects which rely on vegetation which has been replaced by tamarisk will disappear and species which feed off the insects will lose a food source. Larger

Figure 11.10. Tamarisk in Leslie Gulch, May 2006.

Figure 11.11. Tamarisk along the lower Owyhee River below the dam, May 2007.

Figure 11.12. Tamarisk invading Three Fingers Gulch, August 2007.

wildlife which frequent the wetter spots of intermittent streams to obtain water may be pushed out of the habitat due to lack of water availability.

Other invasive species in the lower Owyhee subbasin which adversely affect riparian areas include perennial pepperweed, white top, poison hemlock, houndstongue,

and purple loosestrife (see invasive species discussion in the rangeland component of this assessment).

10. Discussion

The management of riparian areas is a vital environmental and economic issue. Although riparian zones in the lower Owyhee watershed are extremely limited, there are many different groups who are interested in their use and pose the potential for conflicts over how these areas should be managed. Riparian resources are utilized by livestock, wildlife, fish, vegetation, invertebrate animals, river rafters, hunters, fishermen, hikers, campers, boaters, birdwatchers, homesteaders and others. As a result, riparian zones are critical zones for multiple-use planning.

All ecosystems are dynamic and change over time. Riparian systems are probably more dynamic than the surrounding uplands.[11] Planning for riparian zones needs to consider their dynamic nature and attempt to maintain them as fully functioning ecosystems.[8] These ecosystems will vary from what they were during other climatic periods, from what they were before the Spanish introduced horses to the new world, and from what they were at the turn of the 19th century or the turn of the 20th century. There is no going back to some "pristine condition." Invasive species have affected riparian zones. Recreational use of riparian areas in the lower Owyhee subbasin is increasing as the population in the greater Boise area grows.

It is extremely important to consider all uses of riparian zones. No one use is inherently detrimental or beneficial.

Cattle grazing is sometimes cited as a primary negative factor in riparian areas. Although many riparian areas in the United States were mismanaged and degraded by improper livestock grazing, the negative effects of grazing can be minimized or eliminated with proper management.[8,12,17]

Management decisions about livestock grazing need to be made on a case by case basis since there are site factors that change from one riparian community to another. Techniques that attract livestock away from riparian areas, that promote avoidance of riparian areas, or that exclude livestock from riparian areas can all diminish the impact of grazing in one location. Grazing systems may also limit the duration or time of year when livestock graze in or near a riparian area.[3,7,12,17]

Water developments for livestock away from riparian areas may also benefit wildlife. Proper placement and design of water impoundments can create new wildlife habitat as well as providing water for cattle. "Small, wet meadows can also be created by piping overflow water from livestock troughs into fenced areas thereby creating and maintaining such meadows."[12] A pipeline to the west of the Owyhee River in the southern end of the lower Owyhee subbasin was built with the cooperation of the Owyhee Watershed Council, removing livestock grazing along the Owyhee River. It supplies water to numerous stock water troughs well away from riparian areas.

Because of the greater moisture in riparian areas and generally a deeper soil, riparian zones generally have a high rate of recovery of vegetation when they are appropriately managed and protected.

11. Unknowns

How will the expansion of tamarisk into many of the riparian areas of the lower Owyhee subbasin affect the hydrology and vegetation of the area. How would the hydrology and vegetative changes affect wildlife? Will public agencies respond before drastic losses occur?

All the riparian areas in the lower Owyhee subbasin have not been identified or characterized. In the lower 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 relative impacts of different uses of riparian areas in the lower Owyhee subbasin are not known. What impacts are river rafters having on riparian areas? There are limited camping areas along the Owyhee River rafting corridor and these tend to be in riparian areas.

What are the actual impacts of livestock on riparian areas? What reaches are not affected and what reaches are affected? Information on how grazing systems may be used to accomplish such goals as maintenance of woody stream bank vegetation and the prevention of bank crumbling and soil compaction is being developed by experience and research.[12] The management that will result in maintaining, restoring, improving, or expanding riparian areas in the lower Owyhee subbasin is poorly defined.

What are the effects of increased traffic and fishing on the riparian vegetation and functioning along the Owyhee River below the dam?

B. Wetlands

No wetlands have been identified in the lower Owyhee subbasin. Areas around the Turnbull, Piute, and Duck Creek dry lakebeds temporarily act as wetlands in very wet years as do several other smaller dry lakebeds. The extent and location of the temporary wetlands vary with flooding and desiccation cycles.

C. Channel habitat type

1. Definition

A stream channel runs across a valley floor. Valley characteristics and channel morphology (form) are interrelated. They help determine how the stream fits into, and interacts with, its valley.[4]

Basic channel habitat type is defined by three primary parameters: channel gradient, channel confinement, and bedrock. The channel gradient is the slope of the channel bed. The channel confinement is defined as a ratio of the "bankfull" channel width to the width of the modern floodplain. Typically channel confinement is a description of how much a channel can move within its valley before it is stopped by a hill slope or terrace. A broad valley floor may contain a stream channel that is either constrained or unconstrained. Constraints may be adjacent land forms or human constructions such as roadbeds or dikes. A "bedrock canyon channel" is where a stream has cut a gorge through bedrock.[4,14]

Identification of channel habitat type is designed to help identify those portions of the channel that are most responsive to factors which impact channel development. The principal factors which could affect channel characteristics are large woody debris, peak flows, and whether the sediment supply being washed down a stream is fine or coarse. The more responsive areas are most likely to show changes from both land management activities and restoration efforts.[14]

2. Channel habitat types in the lower Owyhee subbasin

Channel habitat types are applicable to perennial streams and some intermittent streams. In the lower Owyhee subbasin there has been no ground survey of valleys to identify which ones contain an intermittent stream as opposed to those which contain an ephemeral stream. Ephemeral streams only run for a short period of time after a significant rainfall or snowmelt event.

This preliminary analysis of the channel habitat types in the lower Owyhee subbasin concentrated on the Owyhee River, the principal perennial stream and on Dry Creek, an intermittent stream with perennial reaches. The analysis was conducted using the United States Geologic Survey topographic maps (Appendix A). Field verification was beyond the scope of this assessment. No channel habitat studies have been conducted in the lower Owyhee subbasin.

a. Owyhee River upstream from Owyhee Reservoir

All of the Owyhee River in the lower Owyhee subbasin above Owyhee Reservoir has a gradient of less than 1%. In approximately 48 river miles the elevation of the river drops from 3341 feet to 2670 feet, or a slope of 0.3%. The majority of the Owyhee River channel meets the criteria for confined, the width of the channel is less than two times the width of the floodplain. There are a few small stretches that may be moderately confined where the floodplain width is two to four times the width of the channel. There may even be three sections where the channel is considered unconfined with the floodplain greater than four times the width of the channel (Table 1).

Table 1. Stream reaches of the Owyhee River upstream from the Owyhee Reservoir where the channel is moderately confined (M) or unconfined (U).

Township	Range	Section	Confinement	Approximate length of stream reach
30 S	41 E	9	U	1 mi
29 S	40 E	32	Poss. M	¾ mi
29 S	41 E	29,30	Poss. M	1 mi
29 S	41 E	4	M	½ mi
28 S	41 E	29	Poss. M	½ mi
28 S	41 E	28	Poss. M	¼ mi
27 S	42 E	20, 21	U	½ mi
27 S	42 E	24	Poss. M	¼ mi
27 S	43 E	7, 18	M	1 mi
27 S	43 E	5, 6	M, some poss. U	3 mi
26 S	43 E	32	M	1 mi
26 S	43 E	21	M	½ mi

The majority of the Owyhee River upstream from Owyhee Reservoir is described as a low gradient confined channel. Typically rivers with this type of channel run across boulders, cobbles, or bedrock with pockets of sand, gravel, or cobbles. "The presence of confining terraces or hill slopes and control elements such as bedrock limit the type and magnitude of channel response to changes in input factors."[13] These channel types tend to pass most high flows without changing the channel and carry most of the introduced fine sediment downstream.[13] (See appendix H for a further description of channel types.)

b. Owyhee River below the Owyhee Dam

The Owyhee River below the outlet from the Owyhee dam is also a low gradient river. In 28 miles from the dam to the mouth with the Snake River, the elevation of the water goes from 2,345 feet to 2,180 feet, a 0.1% slope. However, the Owyhee River channel below the dam is much less confined (Table 2).

Table 2. Confinement of stream reaches of the Owyhee River downstream from the Owyhee Dam. C = confined, M = moderately confined, U = unconfined

Approximate River miles	Confinement	Approximate River miles	Confinement
28 to 25	M to U	16 to 15	M
25 to 24	C	15 to 13.8	C
24 to 22½	M to U	13.8 to 0	U, constricted at mile 10
22½ to 16	mostly U		

The majority of the Owyhee River below the Owyhee Dam is classified as either low gradient moderately confined channel or low gradient unconfined channel.

A low gradient moderately confined channel frequently has a narrow floodplain which runs alongside at least part of the channel. Low terraces which may be covered by flood flows may exist on one or both sides of the channel. The base material varies from fine gravel to bedrock. While a large portion of fine sediment is usually transported past these sections, coarser sediment is deposited. Channels of this type are particularly vulnerable to localized scour. The may also be responsive to bank stabilization efforts such as riparian planting and fencing.[13]

Low gradient unconfined channels are further classified by stream size determined by flow. Since the average annual stream flow of the Owyhee River is greater than 10 cubic feet per second, the channel is classified as low gradient large floodplain. Coarse sediment tend to be deposited by these channels. High water flows tend to spread out across the valley. There is little streambed scour, but the channel is subject to lateral movement and bank erosion occurs as new channels develop. "Due to the unstable nature of these channels, the success of many enhancement efforts is questionable."[13]

c. Dry Creek

Going upstream from Owyhee Reservoir on Dry Creek, the first 1500 feet have a gradient greater than 2%, considered a moderate gradient. From that point upstream past Freezeout Creek about ½ mile, the gradient is less than 2% or low. The next 3

miles have a moderate gradient of about 4%. Beyond this stretch the rest of the creek up to just south of Boundary Reservoir has a gradient less than 2%. The remainder of the creek up to Rock Spring Reservoir has a gradient greater than 2%.

Dry Creek is perennial in some reaches and intermittent in others. It is not possible without field verification to identify either the bankfull width of the stream or the width of the flood plain. One reach called Dry Creek Gorge has sections which probably would be classified as moderately steep narrow valley.

3. Unknowns

Thorough channel habitat studies have not been conducted in the lower Owyhee subbasin.

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