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Chapter 2

# Existing Conditions





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## 2.1 Natural Resources

### 2.1.1 Climate

The climate of the area is typical of the high desert. However, due to the topographic and elevation differences between areas on the western part of the study area (Ririe Outlet Channel) and those on the eastern part (Tex Creek WMA), there is some variability across the study area. Generally, the higher elevation areas of Tex Creek are cooler and wetter than the lower elevation areas of Cartier Slough and the Ririe Outlet Channel.

Overall, the climate of the area is continental in character, with little marine influence, resulting in a wide variability between winter and summer temperatures. Occasional dry arctic air masses from Canada descend over the area resulting in winter minimum temperatures that can be well below zero. In general, summer and fall are sunny and marked by occasional thundershowers, while winter and spring are the wettest months and have more limited amounts of sunshine.

Average annual precipitation in the area ranges from around 10 inches near the Ririe Outlet Channel to as high as 18 inches in the higher elevations of the Tex Creek WMA. August is typically the driest month, while May is the wettest. Temperatures in the area vary widely by

season as well as by elevation. The average daily maximum temperature in July is 80°F, while the average maximum temperature in January is 31°F. Temperatures rarely exceed 90°F but can dip well below 0°F during occasional arctic outbreaks in the winter months. Winter snow depths average around 8 to 10 inches with higher amounts in the higher elevations of the Tex Creek WMA. There are an average of 105 frost-free days along the Snake River plain near Cartier Slough and the Ririe Outlet Channel and fewer than 90 frost-free days near Ririe Reservoir and Tex Creek WMA. The prevailing winds in the area are from the southwest.

### 2.1.2 Topography

Although the topography of the area varies widely from east to west, the entire region is located on the western edge of the Middle Rocky Mountains near the Snake River Plain. The terrain ranges from the steeply sloped foothills and canyons of the Caribou Range on the east to the relatively flat terrain of the Snake River Plain on the west. Elevations at the Ririe Outlet Channel average 4,724 feet.

The Tex Creek WMA/Ririe Reservoir area is characterized by a broad, rolling plateau marked by several steep valleys and canyons, the largest of which is the canyon carved by Willow Creek. These canyons are cut into the southeast to

northwest trending overthrust of the Caribou Range.



Photo 2-1. Rolling topography of the Tex Creek WMA.

Topography in this area varies from gently undulating benchlands to steep hillsides and canyon walls. Ririe Reservoir is located within Willow Creek Canyon, which is approximately 250 feet below the surrounding plateau at Ririe Dam. Some areas of the reservoir are bordered by steep cliffs that rise to the plateau above. Elevations range from 5,112 feet at Ririe Reservoir to 7,287 feet in adjacent areas of Tex Creek WMA.

The Cartier Slough - a channel of the Henry's Fork River - and Ririe Outlet Channel area are located in the Snake River Plain, a broad, flat to gently sloping valley formed by the Snake River. Cartier Slough is a channel of the Henry's Fork River. The topography in this area is predominantly flat to gently sloping and features many sloughs, channels, and potholes within the floodplain. The Ririe Outlet Channel is situated in the floodplains of both Willow Creek and the Snake River. The topography surrounding the channel is predominantly flat. Elevations range from 4,724 feet at the Ririe Outlet Channel to 4,820 feet at Cartier Slough WMA.

### 2.1.3 Hydrology

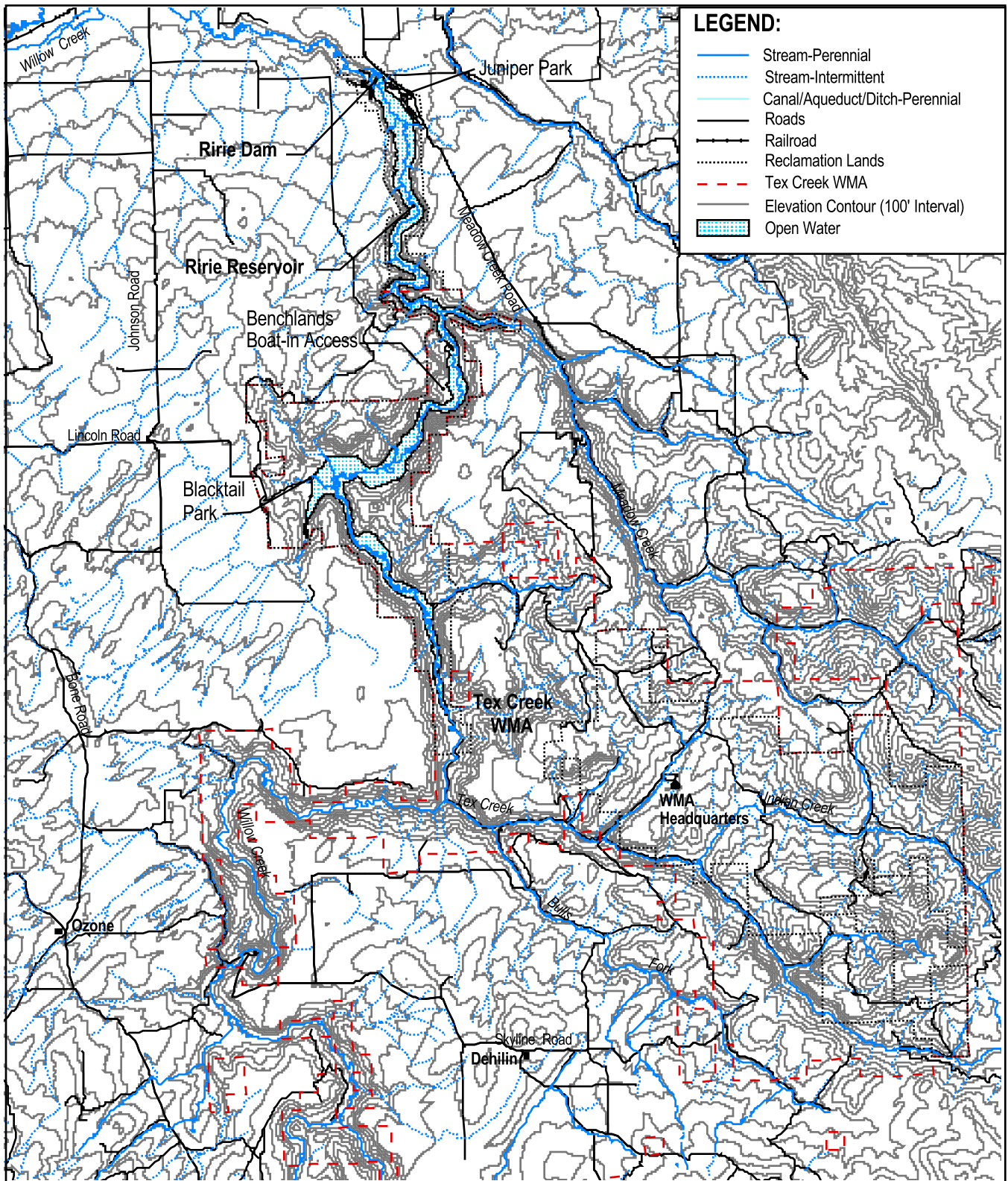
Ririe Reservoir is a high desert water body fed by approximately 95 miles of streams in the Willow Creek drainage area (see Figure 2.1-1). The area receives approximately 10 to 18 inches of annual precipitation, mainly as snow or early spring rain. The reservoir was completed in 1977 and is managed primarily for flood control and irrigation.



Photo 2-2. Relatively flat topography along the Ririe Outlet Channel.

It has a total storage capacity of 100,541 acre-feet. Eighty percent of the total storage capacity is for irrigation and flood control management; 10 percent is dead storage that can serve for conservation; and 10 percent is for emergency flood control. The reservoir is approximately 10.5 miles long, with a surface area of approximately 1,560 acres and mean depth of 64 feet. The U.S. Geological Survey reports the reservoir drainage area, "excluding the area above Grays Lake outlet," as 487 square miles (Brennan et al. 1996). Table 2.1-1 provides reservoir discharge and storage information.

A 7.8-mile long floodway by-pass channel (the Ririe Outlet Channel) extends west to the Snake River upstream of Idaho Falls from a point about 6 miles downstream of Ririe Dam on Willow Creek.



**Figure 2.1-1**  
**Hydrology - Ririe Reservoir**  
**and Tex Creek WMA**



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The information displayed here is based on the best available data at the time of publication. Neither the authors, Reclamation, or any other party here warrant or represent that the information is in every respect complete and accurate, and are not held responsible for errors or omissions.

Source: USBR, 2001; EDAW, 2001

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**Table 2.1-1. Ririe Dam and Reservoir Discharge Capacity and Reservoir Storage.**

<b>Discharge Capacity</b>			
<b>Item</b>	<b>Water Surface Elevation (feet)</b>	<b>Flow (cfs)</b>	
Outlet	5,119.0	4,250 <sup>1</sup>	
Spillway (crest elevation is 5093.0 feet)	5,118.6	40,000	
<b>Reservoir Storage<sup>2</sup></b>			
<b>Item</b>	<b>Water Surface Elevation<sup>3</sup> (feet)</b>	<b>Volume (acre-feet)</b>	<b>Surface Area (acres)</b>
Flood surcharge	—	(0)	—
Active	5,119.0	90,541	1,560
(Exclusive flood control)		(10,000)	
(Joint use)	5,112.8	(80,541)	1,472
Inactive	5,023.0	6,000	364
Dead pool	4,997.0	4,000	—
<b>Total</b>		<b>100,541</b>	

Source: Reclamation 1997

<sup>1</sup> Channel capacity is considerably less than the outlet capacity.

<sup>2</sup> Data from Reservoir Capacity Allocation sheet in the SOP.

<sup>3</sup> At top of capacity allocation.

The Outlet Channel is intended to reduce flooding on lower Willow Creek in Idaho Falls.

The USGS maintains three surface-water gauges in the vicinity of Ririe Reservoir:

1. Station number 13057940—Willow Creek below Tex Creek
2. Station number 13057950—Ririe Lake near Ririe
3. Station 13058000—Willow Creek near Ririe

The annual runoff in Willow Creek below Tex Creek is 70,820 acre-feet—approximately 70 percent of the total storage capacity in Ririe Reservoir (Brennan et al. 1996). This runoff calculation is based on the period of record August 1977 to September 1979, and October 1985 through water year 1995. About 0.25 mile downstream of Ririe Dam, the annual runoff in Willow Creek is 75,880 acre-feet based on water years 1975 through 1995 at USGS station

number 13058000 (Brennan et al. 1996). Flow from Willow Creek into the reservoir typically peaks in April and May and is at a minimum during the winter. After spring runoff, the reservoir is held as high as possible for recreation while meeting downstream natural flow rights and irrigation demands on the mainstem Snake River (Reclamation 1997). During the winter, a 20-mile reach of Willow Creek downstream of Ririe Dam is annually dewatered to prevent floods caused by ice buildup near Idaho Falls (IDFG 1996). Some seepage may pass the gate but sinks into the creek bed (Brennan et al. 1996). During irrigation season, reservoir releases are held to 400 cfs or less whenever possible to prevent erosion of the stream channel and damage to farmer pump stations (Reclamation 1997).

Cartier Slough is located in the floodplain of the Henry's Fork of the Snake River (see Figure 2.1-2). The river drains an area of approximately 2,920 square miles above the

WMA. The average annual precipitation in the area is about 12 inches. The dominant hydrological features of the area are the many small channels and potholes that are present in the floodplain. These features contain water for varying lengths of time during the spring and summer. The main channel and larger sloughs remain ice-free until mid-December, with some areas open most of the winter. Ice-out occurs in late-March or early-April and is followed by flooding which may cover up to 90 percent of the area through May and June. USGS station number 13045500 is located on the Henry's Fork of the Snake River just upstream of the WMA. The mean annual flow at this gauge is 2,630 cfs. Flows peak during May and June and are lowest in August and September.

#### 2.1.4 Water Quality

The erosion potential of the fine soils in the Ririe Reservoir watershed is high; as a result, sediment is the primary pollutant of concern in the reservoir and throughout much of the Willow Creek drainage. Upstream of Ririe Dam, turbidity is high during the late winter and spring runoff and generally remains so until midsummer (IDFG 1996). Ririe Reservoir and many of the creeks within the boundaries of Tex Creek have been determined to be water quality limited because of high sediment loads.

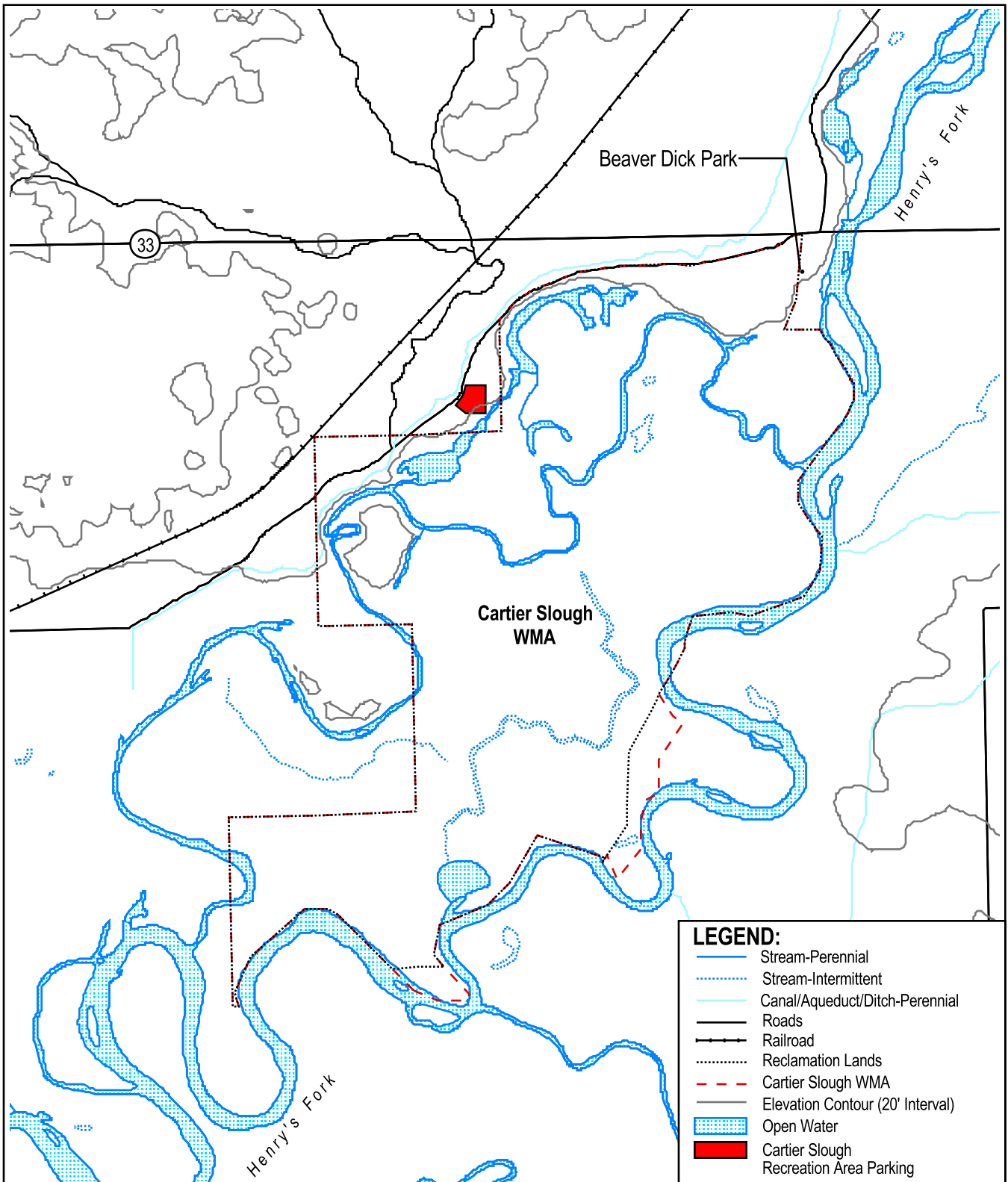
This means that they exceed water quality standards or do not support their designated beneficial uses (Idaho Department of Environmental Quality [IDEQ] 1998). As a result, these water bodies have been listed in the Draft 1998 303(d) List (IDEQ 1998 submitted to EPA January 7, 1999), and are required to have a Total Maximum Daily Load (TMDL) submitted to the U.S. Environmental Protection Agency (EPA) in 2002. Table 2.1-2 lists the water bodies in the vicinity of Ririe Reservoir that are included in the Draft 1998 303(d) List.

According to Idaho Department of Health and Welfare rules, these waters "are to be protected for beneficial uses, which includes all recreational use in and on the water and the protection and propagation of fish, shellfish, and wildlife, wherever attainable." In August 1997, as part of the IDEQ Beneficial Use Reconnaissance Project, Ririe Reservoir water quality was measured at two stations. One station was located at the mouth of Willow Creek and the other in the Ririe Reservoir forebay (the pool just above the dam). Data from that particular sampling effort indicated intermediate nutrient availability and biological productivity (borderline mesotrophic/meso-eutrophic) and a stratified reservoir consistent with the trophic status determination reported in the Classification of Idaho's Freshwater Lakes (Milligan et al. 1983).

**Table 2.1-2. Draft 1998 303(d) Listed Water Body Segments in the Vicinity of Ririe Reservoir**

Water Body	Boundary	Miles of Listed Stream
Willow Creek	Ririe Dam to the Hydrologic Unit Code (HUC) boundary	5.38
Ririe Reservoir	N/A	N/A
Willow Creek	Grays Lake Outlet to Ririe Reservoir	16.79
Willow Creek	Headwaters to Sellars Creek	19.09
Meadow Creek	Headwaters to Ririe Reservoir	10.58
Tex Creek	Headwaters to Indian Fork	8.34

Source: IDEQ 1998



**Figure 2.1-2**  
**Hydrology of Cartier Slough**

1000   0   1000   2000   3000 Feet

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Shallow chlorophyll-a and total phosphorus concentrations measured during this particular event were higher in the Willow Creek mouth than in the forebay. A fecal coliform sample collected in the forebay resulted in less than 10 colonies per 100 mL. This level is considered low and is far below the Idaho water quality criteria for primary and secondary contact recreation.

Cartier Slough gets its water from surface and groundwater flows associated with the Henry's Fork of the Snake River. No specific water quality data are available for Cartier Slough; however, the water would be expected to be of similar quality as that in the Henry's Fork. The Henry's Fork in this reach is not listed in the Draft 1998 303(d) List of impaired water bodies.

The Ririe Reservoir Outlet Channel is dry for most of the year and does not support aquatic life.

### **2.1.5 Geology**

Ririe Reservoir and the Tex Creek WMA are located near the transition between the eastern Snake River Plain and the Idaho-Wyoming Thrust Belt. The eastern Snake River Plain consists primarily of relatively flat-lying, extrusive volcanic rocks, including basalt, rhyolite, and tuff. The volcanic rocks are generally of Quaternary and Tertiary age (between a few thousand to 65 million years old). The Idaho-Wyoming Thrust Belt consists of folded and thrust-faulted sedimentary rocks, including limestone, sandstone, and shale. Near the study area, these rocks range in age from Jurassic to Cretaceous (between 208 and 66 million years ago). Near the study area, the folded sedimentary rocks are overlain by relatively flat-lying volcanic rocks. Willow Creek and Tex Creek have eroded canyons

through the volcanic rocks and exposed the older folded rocks in the valley walls.

Along the southern half of Ririe Reservoir, south of Meadow Creek, the valley walls are comprised of folded sedimentary rocks of the Cretaceous-age Wayan Formation (between 66 and 144 million years old). The Wayan Formation consists of interbedded sandstone, dark shale, limestone, conglomerate, and occasional layers of impure coal. A fault stretching northwest-southeast has been mapped along Meadow Creek where it enters the reservoir. From Meadow Creek north to the dam site, the bedrock in the canyon walls is composed of volcanic rocks including basalt and rhyolite, as well as the Salt Lake Formation, which consists of light-colored rhyolitic tuffs, calcareous clays, sandstones, and conglomerates.

Along much of the reservoir, the surrounding steep valley walls are covered by Quaternary-age (less than 5-million-year-old) alluvial fan and landslide deposits. These soil-like deposits were formed after erosion of the canyon by Willow Creek. These types of deposits, which are typically composed of mixed gravel, sand, silt, and clay, are easily eroded by streams and wave action. The valley bottom is covered by stream alluvium, which likely consists of gravel, sand, silt, and minor amounts of clay.

Various volcanic rocks, including basalt, rhyolite, welded tuff, and volcanic breccias, underlie the surrounding plateau. A layer of silty windblown loess covers these deposits in areas of low relief on the plateau.

Mineral resources in the region include the following: gravel, sand, pumice, shale, basalt, sandstone, limestone, tuff, silver, copper, clay, and gold. Two coal prospects were developed near Ririe Reservoir. The Brinson Coal Mine, located just north of the confluence of Tex



Creek and Willow Creek, consisted of a 115-foot tunnel and 40-foot shaft.



Photo 2-3. Basalt cliffs on Ririe Reservoir.

The miners attempted to extract coal from coal seams less than 1-foot thick. The Cloward Coal Mine was located southwest of Ririe Reservoir on Willow Creek near Cloward's Crossing. This mine consisted of a 100-foot long tunnel, where miners attempted to extract coal from a 1.5-foot thick coal seam. The coal was "not even good for local use" (Savage 1961).

### 2.1.6 Soils

The Torriorthents-Rock Outcrop complex dominates soil in the vicinity of Ririe Reservoir (USDA Natural Resources Conservation Service [NRCS] 1981a; formerly the U.S. Soil Conservation Service). The complex is approximately 60 percent Torriorthents and 30 percent rock outcrop and is highly erosive. Certain areas of the Aquic Cryoborolls-Typic Cryaquolls complex are found on level to gently sloping areas under and immediately adjacent to the reservoir. These soils are described in Table 2.1-3.

Soils at Cartier Slough are primarily channeled Haplaquolls, Mathon-Rock outcrop-Modkin complex, and Grassy Butte loamy sand (NRCS 1981b). The soils are inundated by flooding every spring (IDFG 1998a) but generally have low water erosion potential (Table 2.1-3).

Soil erosion is a serious problem on Tex Creek and surrounding private lands in the Willow Creek watershed. Removal of bank-stabilizing riparian vegetation, especially in agricultural areas, has left the highly erosive soils vulnerable to serious erosion. IDFG has implemented numerous localized measures primarily associated with improving riparian vegetation conditions to reduce erosion problems on Tex Creek, and the NRCS has programs to reduce erosion from agricultural lands. Section 2.1.4, Water Quality, discusses soil erosion, control measures on Tex Creek, and associated water quality problems in greater detail. Soil erosion is generally not a problem at Cartier Slough because of the flat topography of the site. Some minor erosion does occur along the banks of the Henry's Fork during high runoff events. However, this erosion is related to natural fluvial processes associated with seasonal high flows in the unchanneled river.

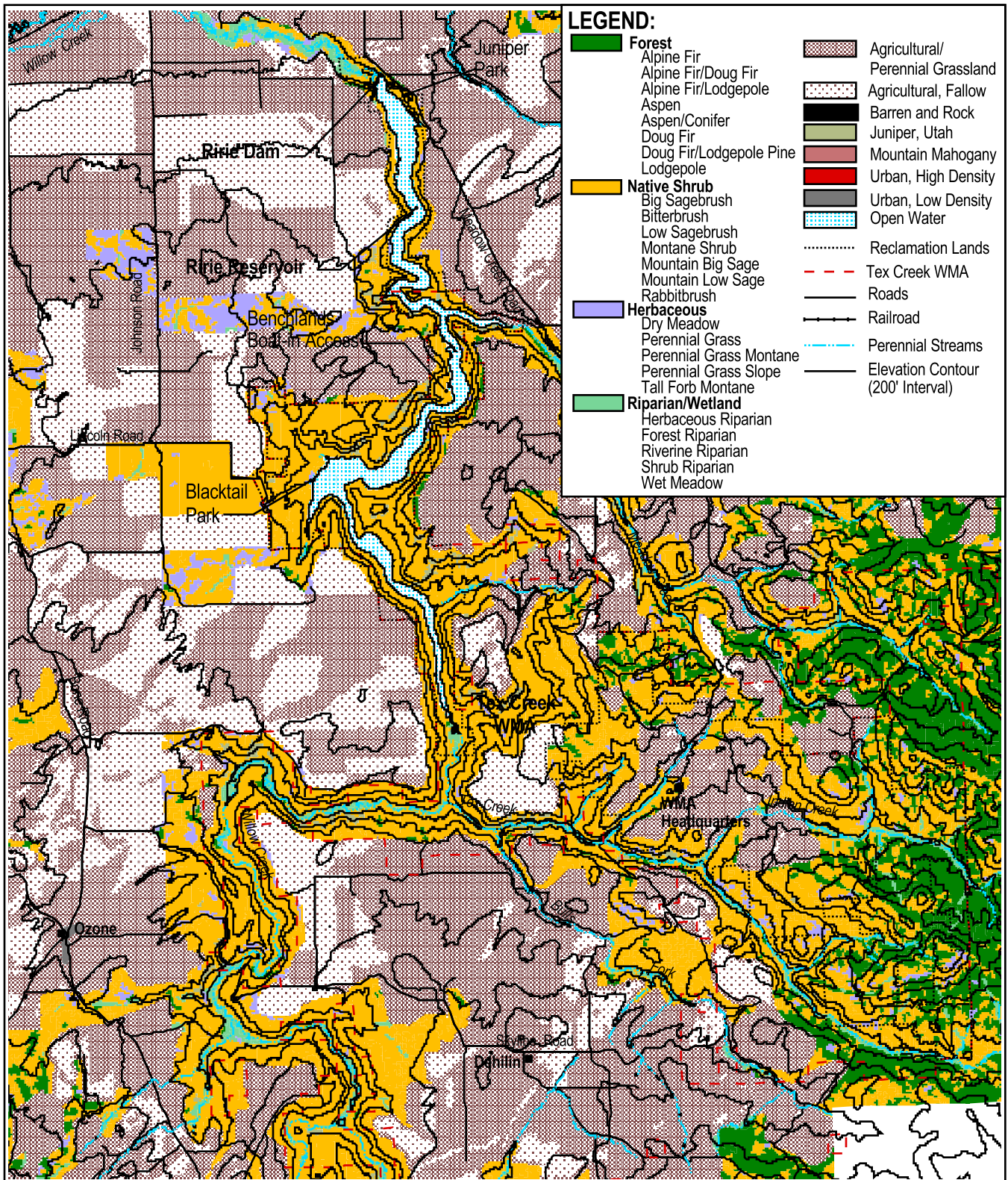
### 2.1.7 Vegetation

#### 2.1.7.1 Ririe Reservoir and Tex Creek WMA

##### *Upland Cover Types*

Ririe Project lands and Tex Creek share several common vegetation communities (see Figure 2.1-3). Project lands are at lower elevations than much of the rest of Tex Creek, and elevation influences the types of plant communities present. Big sagebrush (*Artemisia tridentata*) is the dominant cover type on project lands. Juniper (*Juniperus*) occurs in fair abundance on some steep, southeast-facing slopes above the reservoir.

A bitterbrush shrub steppe community, consisting mainly of antelope bitterbrush (*Purshia tridentata*) and native bunch grasses and forbs, occurs in a few areas. A montane shrub community dominated by western



**Figure 2.1-3**  
**Vegetation - Ririe Reservoir**  
**and Tex Creek WMA**



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**Table 2.1-3. Affected Soils at Ririe Reservoir, Tex Creek, and Cartier Slough**

Name	Characteristics	Location	Erosion Hazard	Permeability	Rooting Depth (inches)
<b>Ririe/Tex Creek</b>					
Torriorthents	Formed in colluvium derived from shale, volcanic rock, or sandstone. Slopes of 35 to 65 percent. Rock fragment content from 0 to 80 percent. Mildly to strongly alkaline. Shallow to very deep and well drained.	60% of soil near Ririe Reservoir	High; rapid runoff	Slow to rapid with low to high water holding capacity	20 to 60
Ririe Silt Loams	Moderately alkaline. Very deep and well drained, with moderate permeability.	South- and west-facing slopes of foothills near reservoir	Moderate; slow runoff. Steeper slopes increase runoff; hazard becomes very high	Moderate	Greater than 60
Aquic Cryoborolls-Typic Cryaquolls complex	Very deep and somewhat poorly drained adjacent to the reservoir or river. Composed of silt loam to silty clay. Wetland and riparian communities are typically found on these soils.	Near Ririe Reservoir	Slight; slow runoff	—	—
Rin Silt Loam	Neutral, very deep, and well drained.	North-facing slopes in Tex Creek	Moderate; rapid runoff	—	—
<b>Cartier Slough</b>					
Channeled Haplaquolls	Deep, very poorly or poorly drained. Ponds and channels measuring up to 2 feet deep and 15 feet wide are present on the surface.	Floodplains near the Teton and Snake Rivers	Slight	—	20 to 60
Mathon-Rock outcrop-Modkin complex	Formed in sandy eolian deposits. Shallow with bedrock at 20 to 40 inches.	Laid over basalt plains in Cartier Slough	Moderate; slow runoff	Moderately rapid	—
Grassy Butte	Loamy sand formed in sandy eolian deposits. Deep and somewhat excessively drained.	Laid over basalt plains in Cartier Slough	Water erosion hazard is slight to moderate; wind erosion is high	Rapid; low water holding capacity	—

Source: NRCS 1981a and 1981b



Photo 2-4. Juniper-sagebrush vegetation common at Tex Creek.

serviceberry (*Amelanchier alnifolia*) is also a minor component within project lands.

The Tex Creek Management Plan (IDFG 1998a) defines 12 upland cover types on the WMA. Vegetation in the area is diverse with good interspersions of different cover types. Bitterbrush shrub-steppe is the largest single natural cover type (about 3,500 acres). Big sagebrush, low sagebrush (*Artemisia arbuscula*), juniper, and serviceberry (*Amelanchier alnifolia*) shrub fields are common. Aspen (*Populus tremuloides*) is the most predominant forest cover type. Douglas-fir (*Pseudotsuga menziesii*) occupies about 250 acres. Of the nearly 5,500 acres of historical cropland, about 4,700 acres have been converted back to permanent herbaceous cover, which is dominated by smooth brome (*Bromus inermis*) with lesser amounts of perennial forbs such as alfalfa, Lewis blue flax (*Linum lewisii*), small burnet (*Sanguisorba minor*), and bunch grasses such as Sherman bluebunch wheatgrass (*Agropyron spicatum*). About 800 acres remain in winter wheat rotation to serve as an attractant and high quality winter and spring forage for mule deer (*Odocoileus hemionus*). Reclamation lands within the WMA extend from the lowest

to the highest elevations and include all of the cover types present in the area. Active

vegetation management actions have included planting over 170,000 shrubs.

Vegetation along the Ririe Outlet Channel consists largely of weeds.

### **Wetlands and Riparian Cover Types**

Wetlands and riparian communities perform many important ecological functions, including improving water quality, providing flood control, stabilizing the shoreline, contributing to groundwater recharge and stream flows, providing primary production in the food chain, and offering wildlife and fish habitat. In addition, they also provide social benefits as natural areas for aesthetic, recreational, and educational opportunities.

A variety of Federal and State regulations require consideration of wetlands during construction and other activities. The most significant of these regulations are the National Environmental Policy Act (NEPA), the Clean Water Act (especially Section 404, which requires a permit for wetland disposal of fill and dredge material), the Idaho Lake Protection Act, and the Stream Channel Protection Act.

Fluctuating water levels during the growing season and the steep sides of Willow Creek canyon through the reservoir area eliminate virtually all potential wetland and riparian cover types from the reservoir shoreline. Wetlands and riparian cover types occur along all of the major perennial and intermittent drainages and springs on Tex Creek.

Riparian communities include about 280 acres of willow (*Salix*)-dominated lands and about 300 acres of other riparian cover types. Common overstory and understory species are listed on Table 2.1-4.

**Table 2.1-4. Wetland and Riparian Cover Type Species in Tex Creek**

Common Name	Scientific Name
<b>Overstory Species</b>	
Booth willow	<i>Salix boothii</i>
Drummond willow	<i>Salix drummondiana</i>
Sandbar willow	<i>Salix exigua</i>
Bog birch	<i>Betula glandulosa</i>
Red-osier dogwood	<i>Cornus stolonifera</i>
Bearberry honeysuckle	<i>Lonicera involucrata</i>
<b>Understory Species</b>	
Several sedges	<i>Carex</i> spp.
Baltic rush	<i>Juncus balticus</i>
Western meadowrue	<i>Thalictrum occidentale</i>
Starry Solomon-plume	<i>Smilacina stellata</i>
Goldenrod	<i>Solidago canadensis</i>
Kentucky bluegrass	<i>Poa pratensis</i>

Source: Youngblood et al. 1985



Photo 2-5. Wetland vegetation at Tex Creek.

About 16 acres of ponds have been developed by IDFG to increase waterfowl production and habitat diversity, control erosion, improve water quality, hasten the recovery of eroded areas, and attempt to raise the water table and sub-irrigation of developed fields. Vegetation around the ponds includes hardstem bulrush (*Scirpus acutus*).

**Noxious Weeds**

Noxious weeds have been under active control on Reclamation mitigation lands at Tex Creek and Cartier Slough since management agreements between Reclamation and IDFG were completed in the late 1970s.

Control efforts are more intensive on Teton mitigation lands at Tex Creek than on Ririe

mitigation lands because of access limitations and steep terrain. Control measures include proper land management practices such as mechanical control, chemical control, and biological control. The four main weed species being controlled are musk thistle (*Carduus nutans*), Canada thistle (*Cirsium arvense*), houndstongue (*Cynoglossum officinale*), and hoary cress or white top (*Cardaria draba*). Leafy spurge (*Euphorbia esula*) has not been identified on the area but is found on adjacent lands. Common burdock (*Arctium minus*) is not classified as a noxious weed but is controlled on Tex Creek because it is considered a problem for wildlife habitat. A plan was developed in 1990 to establish guidelines, goals, and objectives for the control of noxious weeds on Tex Creek.

The most common methods of weed movement onto and within Tex Creek are vehicles, animal movements (wildlife, permitted and trespass cattle), hay brought in to Tex Creek as horse feed by hunters and riders, and wind- or water-borne seed. Weed monitoring plots have been established throughout the area for permanent monitoring of infestations.

Stem counts are conducted annually to determine effectiveness of control measures.

The long-term objective is to eliminate chemical control and rely on biological weed control within the area. Biological control was started in the early 1980s by Reclamation and IDFG with the release of the musk thistle seed head weevil around Ririe Reservoir. Starting in the early 1990s, releases of Canada thistle seed head weevils began on Tex Creek. Releases now include Canada thistle stem mining weevils and defoliating beetles. Chemical control is still used on infestations found along roadways, heavily used areas, and new infestations. Rapid revegetation of disturbed soil prior to noxious weed infestation is the preferred management option. Establishment of desirable plants minimizes new weed control infestations.

### Rare, Threatened, and Endangered Plant Species

Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is endemic to moist soils in mesic or wet meadows near springs, lakes or perennial streams within an elevation range of 4,300 and 7,000 feet. The plant appears to be adapted to regular disturbances caused by flooding on floodplains. The plant seems to occur in areas with shallow water tables where water is near the ground surface (18 inches) throughout the growing season and where the vegetation is relatively open and not overly dense. Mature riparian communities do not provide suitable habitat conditions. The orchid thrives in full sun or partial shade.

Ute ladies'-tresses are typically found in two types of plant communities in the RMP area. These communities consist of the spike-rush and the Silverberry/Willow communities. While site specific vegetation surveys have not been conducted, these communities may exist on Willow Creek upstream of the reservoir high water elevation and at the outlet of the dam into Willow Creek. The similar habitats may also occur at Cartier Slough. Ute ladies'-tresses

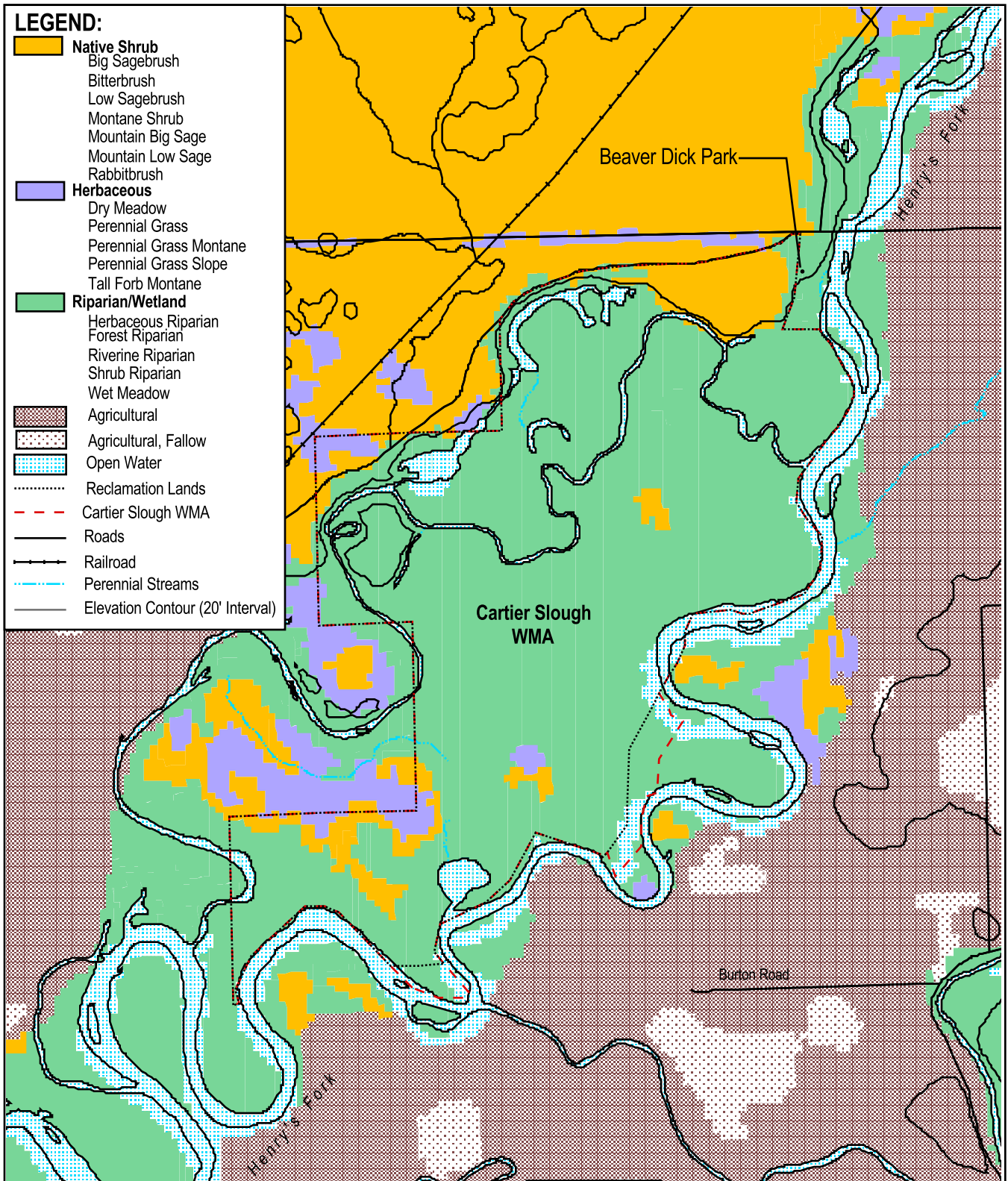
have been located on the South Fork of the Snake River upstream of Idaho Falls.

### 2.1.7.2 Cartier Slough WMA

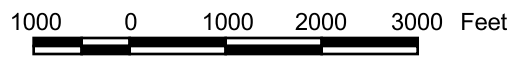
Cartier Slough is located on the floodplain of the Henry's Fork. There are approximately 2.8 miles of riverbank and approximately 4 miles of slough channels (former river meanders). This is an uncontrolled and unchanneled section of the Henry's Fork where seasonal flooding and natural fluvial processes play a critical role in maintaining valuable long-term wildlife habitat. As much as 90 percent of the area is flooded during May and June of high runoff years. This regular flooding exerts a strong influence on the vegetation. The IDFG Cartier Slough Management Plan (IDFG 1998b) indicates that the primary plant communities include about 380 acres of floodplain grassland, 295 acres of willow-dominated communities, and about 155 acres of black cottonwood (*Populus trichocarpa*) and aspen. There are smaller areas of sagebrush/grassland, wet meadow, irrigated perennial grasses and shrubs, and about 35 acres of open water ponds and sloughs. Common species are listed on Table 2.1-5 (see Figure 2.1-4).

### Noxious Weeds

Noxious weed infestations identified in Cartier Slough include leafy spurge, Canada thistle, musk thistle, spotted knapweed (*Centaurea maculosa*) and purple loosestrife (*Lythium salicaria*). These species have come to be present on the area through a variety of means such as deposition of seed material during high flows, spread from motor vehicles, and past cattle grazing. Control measures include both chemical and biological controls and reseeding disturbed areas to increase competition by desirable plant species. High spring flows often hamper control efforts.



**Figure 2.1-4**  
**Vegetation Cover of Cartier Slough & Surrounding Area**



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Source: USBR, 2001; EDAW, 2001

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**Table 2.1-5. Common Plant Species in Cartier Slough**

Common Name	Scientific Name
Black cottonwood	<i>Populus trichocarpa</i>
Aspen	<i>Populus tremuloides</i>
Black hawthorn	<i>Crataegus douglasii</i>
Red-osier dogwood	<i>Cornus stolonifera</i>
Snowberry	<i>Symphocarpus alba</i>
Sagebrush	Artemisia spp.
Rabbitbrush	Chrysothamnus nauseosus
Several willows	Salix spp.
Common cattail	<i>Typha latifolia</i>
Hardstem bulrush	<i>Scirpus acutus</i>
Baltic rush	<i>Juncus balticus</i>
Creeping spike-rush	<i>Eleocharis palustris</i>
Short-beaked sedge	<i>Carex simulata</i>
Reed canary grass	<i>Phalaris asendinaceal</i>
Kentucky bluegrass	<i>Poa pratensis</i>

Source: Youngblood et al. 1985

### **Rare, Threatened, and Endangered Plant Species**

The Ute ladies'-tresses orchid is the only Federally protected plant species that may also occur in Cartier Slough. The most likely locations for suitable habitat would be along the Henry's Fork, where high flows scour vegetation and deposit fine-grained alluvium. Ute ladies'-tresses orchids have been found along the South Fork of the Snake River within 50 miles of Cartier Slough and may occur in suitable habitats in other southeast Idaho locations. No searches for this species have been conducted on Reclamation lands. Field surveys will be conducted prior to any future land-disturbing activities at sites within wetlands or riparian communities on Reclamation lands where this species may occur.

### **2.1.8 Fish and Wildlife**

#### **2.1.8.1 Wildlife**

Tex Creek is managed by IDFG primarily as big game winter range and resident wildlife under agreement with Reclamation and the other landowners. Vegetation management is directed toward providing forage for mule deer (*Odocoileus hemionus*) and elk (*Cervus elaphus*) and habitat for other wildlife. Riparian habitat

improvement along streams within Tex Creek is also a management priority. Cartier Slough is managed by IDFG primarily as habitat for waterfowl and associated wildlife. The most complete and current information regarding wildlife communities at Tex Creek and Cartier Slough is contained in the respective WMA Management Plans (IDFG 1998a and 1998b). Much of the information summarized here is derived from those documents and is not specifically cited again in the text.

Wildlife use of weedy areas along the Ririe Outlet Channel is likely limited to a few pheasants (*Phasianus colchicus*) and some seed-eating songbirds.

### **Non-Mitigation Lands and Ririe and Teton Mitigation Lands at the Tex Creek WMA**

Wildlife habitat and use are similar on Non-Mitigation Lands and Ririe and Teton Mitigation Lands at Tex Creek. The IDFG mission statement for Tex Creek is stated as follows:

Protect and manage the wildlife resources of the Tex Creek Wildlife Management Area, as mitigation for habitat losses elsewhere in the region, to ensure sufficient quantities of



high quality and secure habitat for wintering big game and for a wide variety of other game and nongame species. Provide high quality wildlife-based recreational opportunities and nature viewing compatible with this primary mission for the benefit of the public.

The first five of the seven management priorities listed in the Tex Creek Management Plan relate directly or indirectly to wildlife and wildlife habitat (see Appendix D). In order of priority, these include the following:

1. Big game winter range for elk and deer;
2. Upland game habitat for Columbian sharp-tailed grouse (*Tympanuchus phasianellus*);
3. Public hunting;
4. Other game and nongame habitat; and
5. Wildlife-based recreation, nature viewing, and education.

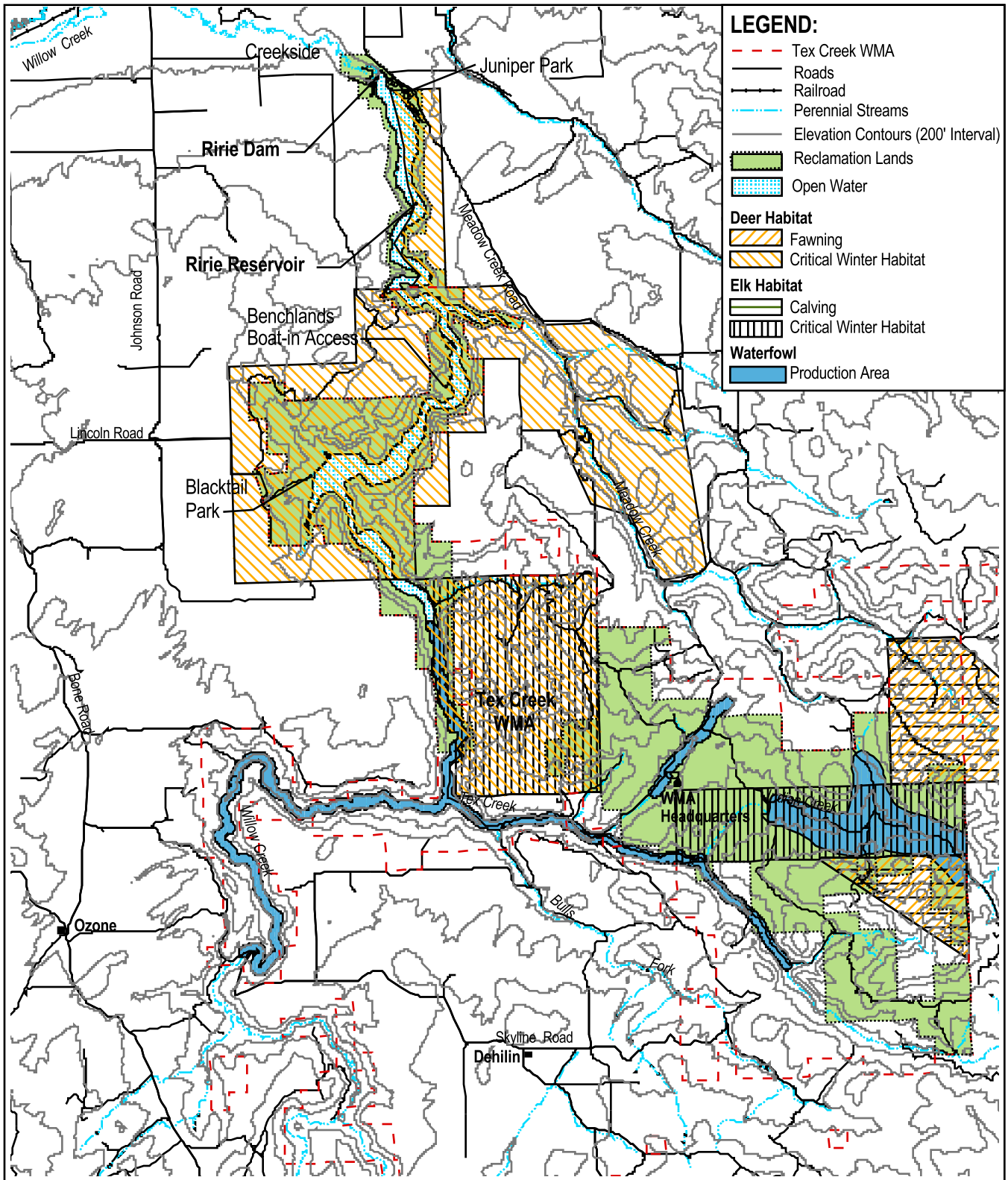
## Mammals

Summer resident big game include about 80 to 100 elk, 200 mule deer, 30 moose (*Alces alces*), and a small number of white-tailed deer (*Odocoileus virginianus*). During the fall rut, an estimated 80 to 100 moose may be present on Tex Creek. Resident elk produce 20 to 30 calves and deer produce 80 to 100 fawns each year.

Reclamation has supported IDFG's habitat improvement programs at Tex Creek during the last 25 years. Primary management activities have focused on improving the condition and expanding the extent of big game winter range. Numbers of elk and mule deer wintering on Tex Creek have increased dramatically during this period from a few hundred of each species when the WMA was formed. Tex Creek currently provides critical winter range for an

estimated 3,200 elk, 4,000 to 5,000 mule deer, and 20 moose. The south and west-facing slopes, as well as the prevailing southwest wind, tend to minimize snow depths and keep travel routes and foraging areas available most of the winter. Typical critical elk and deer winter ranges are shown on Figure 2.1-5. However, it should be noted that critical winter use areas for elk vary from year to year depending on weather conditions, and include essentially all portions of Tex Creek at one time or another. Occupied winter range also varies throughout the season as snow accumulation forces elk to use lower elevation areas. The abundant high quality winter range on Tex Creek minimizes elk depredation on adjacent private lands. IDFG also coordinates uses with a local private landowner to further reduce depredation on private lands. The secure winter range available on Tex Creek is essential to the survival of these large big game herds. This security is directly related to management activities that minimize human conflicts with big game wintering on Tex Creek.

Elk generally migrate to the southeast from Tex Creek for the summer. The timing of migration from their summer range back to the Tex Creek winter range is affected by snow depth and the timing of fall snowstorms. Migration may begin from mid-November to mid-December, with most elk arriving on the Tex Creek winter range by early January (Brown 1981). Movements along traditional migration corridors as far as 70 miles between summer and winter range have been recorded. Critical deer winter range includes all Reclamation non-mitigation lands and adjacent areas, as well as parts of the Meadow Creek drainage to the east of Ririe Reservoir (Figure 2.1-5). The Tex Creek Management Plan (IDFG 1998a) indicates that winter wheat grown on fields adjacent to Tex Creek is heavily used by wintering deer.



**Figure 2.1-5**  
**Major Wildlife Areas of Ririe Reservoir and Tex Creek WMA**



1:125000



The information displayed here is based on the best available data at the time of publication. Neither the authors, Reclamation, or any other party here warrant or represent that the information is in every respect complete and accurate, and are not held responsible for errors or omissions.



Photo 2-6. Elk are common at Tex Creek where important winter range is provided.

IDFG suspects that this use permits more deer to winter in the Tex Creek area than would be possible on available native range alone. Thomas (1987) found that deer that winter at Tex Creek tend to summer in the same areas as do the elk that winter at Tex Creek. Deer also follow the same general migration corridors as the elk. The Tex Creek Management Plan indicates that at least 24 other mammal species occur on the area.

Some of the abundant or common small mammal species are listed on Table 2.1-6. Predators include a few mountain lion (*Felis concolor*), bobcat (*Lynx rufus*), and numerous coyotes (*Canas latrans*). A few black bears (*Ursus americanus*) are also present.

## Birds

Tex Creek provides habitat for four native grouse species. Habitat management for the Columbian sharp-tailed grouse is the second highest priority for IDFG at Tex Creek. Columbian sharp-tailed grouse currently occupy less than 10 percent of their original range (IDFG 1990). Columbian sharp-tailed grouse are considered to be a species of concern by the U.S. Fish and Wildlife Service (FWS), and a sensitive species by both the U.S. Forest Service (FS) and BLM. Columbian sharp-tailed grouse occur in a variety of foothill and low mountain shrub communities including antelope bitterbrush, three-tip sagebrush (*Artemisia tripartita*), and near shrub riparian areas.

At Tex Creek, nests associated with higher shrub densities and taller grass had a substantially higher success rate. Lek or dancing ground counts at Tex Creek have been relatively low in recent years, and most of the leks active in the past 10 years have been abandoned, at least temporarily. However, fall sharp-tailed grouse numbers have been relatively good, suggesting that grouse may not be limited by habitat but rather by spring weather. Cold, wet spring conditions during nesting and for a few weeks after broods hatch

**Table 2.1-6. Small Mammals Present in Tex Creek**

Common Name	Scientific Name
Richardson's and golden-mantled ground squirrels	<i>Spermophilus richardsoni</i> and <i>S. lateralis</i>
Red squirrel	<i>Tamiasciurus hudsonicus</i>
Yellow-bellied marmot	<i>Marmota flaviventris</i>
Northern pocket gopher	<i>Thomomys talpoides</i>
Beaver	<i>Castor canadensis</i>
Bushy-tailed wood rat	<i>Neotoma cinerea</i>
Badger	<i>Taxidea taxus</i>
Porcupine	<i>Erethizon dorsatum</i>
Several rodents	

Source: IDFG 1998b, Groves et al. 1997

is detrimental to brood survival. Sage grouse (*Centrocercus urophasianus*) numbers have declined throughout their range, including the upper Snake River area and Tex Creek (Connelly et al. 2000). Sage grouse are also a priority species for IDFG and the BLM. Sage grouse are dependent on sagebrush habitats during both the winter and nesting seasons. A few leks are known to occur on Tex Creek, but no specific surveys or management actions have been undertaken by IDFG. It is not known whether sage grouse using leks on Tex Creek are migratory or non-migratory, which affects general nesting distances from the lek (Connelly et al. 2000). However, it is very likely that most, if not all, sage grouse that use leks on Tex Creek also nest within Tex Creek because most surrounding former sagebrush habitats have been converted to agriculture.

The Tex Creek Management Plan speculates that some sage grouse may also move into Tex Creek to winter, making this especially important habitat.

The peregrine falcon (*Falco peregrinus*), which occurs in the area, was de-listed as an endangered species in July 1999. Twelve peregrine territories are known to occur in southeast Idaho (Levine et al. 1998), although none nest in the immediate Tex Creek area. There are several nests within 25 miles of Tex Creek, and peregrines certainly pass through the area during migration and juvenile dispersal.

The Tex Creek Management Plan lists 92 species of birds that use Tex Creek. A few of the more common species include those listed in Table 2.1-7 as well as many neotropical migrants. Numbers of nesting waterfowl are low, with mallards (*Anas platyrhynchos*) the most common species. Mallards nest along perennial streams in Tex Creek.

### Amphibians and Reptiles

Some of the more common amphibians and reptiles that occur in Tex Creek include the western rattlesnake (*Crotalus viridis lutosus*), yellow-bellied racer (*Coluber constrictor mormon*), western terrestrial garter snake (*Thamnophis elegans*), common garter snake (*T. sirtalis*), gopher snake (*Pituophis melanoleucus deserticola*), and sagebrush lizard (*Sceloporus graciosus*). Rubber boas (*Charina bottae*) and northern leopard frogs (*Rana pipiens*) are occasionally seen. Populations of many frog species have apparently suffered declines on a global scale in recent years, making all suitable habitat especially important.

### Rare, Threatened, and Endangered Species

The FWS provided a list of species protected under the Endangered Species Act (ESA). Such protected species include the lynx (*Lynx canadensis*), gray wolf (*Canis lupus*), and

**Table 2.1-7. Common Bird Species in Tex Creek**

Common Name	Scientific Name
Golden eagle	<i>Aquila chrsaetos</i>
Northern harrier	<i>Circus cyaneus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
American kestrel	<i>Falco sparverius</i>
Killdeer	<i>Charadrius vociferus</i>
Blue grouse	<i>Dendragapus obscurus</i>
Ruffed grouse	<i>Bonasa umbellus</i>
Mourning dove	<i>Zenaida macroura</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Black-billed magpie	<i>Pica pica</i>

Source: IDFG 1998b, Groves et al. 1997

whooping crane (*Grus americana*). Idaho is near the southern limits of the ranges for the lynx, which was recently listed as a threatened species. Mountainous regions supporting stands of spruce (*Picea* sp.) and fir (*Abies* sp.), Douglas-fir, and lodgepole pine (*Pinus contorta*) are generally considered to be suitable lynx habitat (Ruggiero et al. 1999).

Snowshoe hares (*Lepus americanus*) represent the primary prey for lynx (Hall 1981), and red squirrels (*Tamiasciurus hudsonicus*) are an important alternate prey when hares are scarce (Ruggiero et al. 1999). Higher elevation lands in the southeast corner of Tex Creek and on adjacent FS lands to the east of Tex Creek may provide suitable lynx habitat based on the tree species present and the relatively undisturbed nature of those areas. Snowshoe hares and red squirrels are probably present in both areas. Gray wolves were re-introduced into Yellowstone National Park and central Idaho in the mid-1990s. Wolves in the Yellowstone Management Area (an FWS designation that includes the Ririe Reservoir and Tex Creek areas) are classified as a nonessential experimental population. They now occur widely throughout much of Idaho in forested and shrub communities. In the winter, wolves are closely associated with wintering big game. Because of the large numbers of deer and elk that winter in the Tex Creek area, wolves could occupy Tex Creek during the winter. Whooping cranes now occur in portions of southeast Idaho as part of an effort to re-introduce the species at Gray's Lake National Wildlife Refuge, which is located about 20 miles south of Tex Creek. This population is also designated as nonessential experimental. These cranes migrate between southeast Idaho and New Mexico. They use fresh water marshes and wet meadows during the summer and also feed in grain fields (Groves et al. 1997). Recorded occurrences in Idaho include the Gray's Lake area and the Teton River

valley 25 miles east of Tex Creek. Both of these areas include large fresh water marshes. No whooping cranes have been reported in the immediate Tex Creek area. Grain fields in the vicinity of Tex Creek probably do not provide very suitable habitat because of the lack of large nearby marshes.

The bald eagle (*Haliaeetus leucocephalus*) is listed as threatened in Idaho. One bald eagle nest is located just upstream of one of the tributaries to Ririe Reservoir near the north end of Tex Creek. The nest is about 1200 feet from the reservoir. The pair produced eggs but did not fledge any young in 1998 (Beals and Melquist 1998). Nest productivity data for 1999 are not available. The nest was occupied but not productive in 2000 and 2001.

Bald eagle territories usually include a nest site, perch trees, and foraging areas. Eagles typically nest in isolated, mixed-aged timber in codominant or dominant trees with a clear flight path to feeding areas which, in this case, would be the reservoir. Fish in the reservoir provide the primary prey for the bald eagle. Management for nest protection typically requires a 1/4-mile no disturbance radius around the nest throughout the breeding season (April through July), but foraging areas may extend throughout the reservoir. Human presence interferes with normal nesting and foraging behavior, although the degree to which their behavior is affected varies for individual eagles.

### **Cartier Slough WMA**

Cartier Slough provides important habitat (forage, shelter, and reproduction sites) for a large number of wildlife species. Among the most crucial, abundant, and sensitive of these habitats are riparian areas and wetlands. The riparian communities and various wetland habitats are critical as nesting feeding and

loafing habitat for waterfowl, shorebirds, and wading birds. The Cartier Slough Management Plan indicates that there are 197 species of birds, 25 species of medium and large mammals plus many small mammal species, and at least 5 amphibian and reptile species found in Cartier Slough.

**Mammals**

Common mammals include the coyote, red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), and porcupine (*Erithizon dorsatum*). Mule and white-tailed deer numbers are estimated at 25 each throughout the year, plus an additional 25 mule deer during the winter. A few moose are also present and beavers (*Castor canadensis*) and muskrats (*Ondatra zibethicus*) use aquatic habitats along the river and sloughs. River otters (*Lutra canadensis*) are also present in and along the Henry’s Fork.

**Birds**

The diverse mix of wetland and riparian cover types and Cartier Slough’s location adjacent to the Henry’s Fork result in a diverse and abundant avifauna. Avian use of Cartier Slough is dominated by waterfowl, shorebirds, and other water-related species; 22 species of raptors; and a large number of neotropical

migrants. A few of the most abundant species include those listed in Table 2.1-8.

Although peregrine falcons, which were recently de-listed as an endangered species in 1999, are not known to nest in the Cartier Slough, there are nests within several miles. Peregrines are probably present throughout most of the year because of the large numbers of waterfowl that use the area.

**Amphibians and Reptiles**

Three amphibians and two reptiles are known to occur in Cartier Slough. These include the northern leopard frog, striped chorus frog (*Pseudacris triseriata*), painted turtle (*Chrysemys picta*), western terrestrial garter snake, and gopher snake.

**Rare, Threatened, and Endangered Species**

One bald eagle nest is located near the south end of Cartier Slough, and bald eagles are common in the area all year. The Cartier Slough pair fledged one young in 1998 (Beals and Melquist 1998). The abundant fish in the Henry’s Fork as well as waterfowl sustain the eagles that use the area. Bald eagle habitat needs were discussed above.

**Table 2.1-8. Abundant Bird Species in Tex Creek**

Common Name	Scientific Name
Pied-billed grebe	<i>Podilymbus podiceps</i>
Great blue heron	<i>Ardea herodias</i>
Black-crowned night heron	<i>Nycticorax nycticorax</i>
Snowy egret	<i>Egretta thula</i>
White-faced ibis	<i>Plegadis chici</i>
Canada goose	<i>Branta canadensis</i>
Mallard and several other dabbling and diving ducks	<i>Anas platyrhynchos and other duck species</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Northern harrier	<i>Circus cyaneus</i>
Osprey	<i>Pandion haliaetus</i>
Sandhill crane	<i>Grus canadensis</i>
Six species of swallows	<i>Hirundinidae spp.</i>
Several shorebirds	

Source: IDFG 1998b, Groves et al. 1997

2.1.8.2 Fish

Since its creation, Ririe Reservoir has developed into a popular fishery and supports one of the most intensively used salmonid fisheries in the state (IDFG 1996). One of the main reasons for this popularity is the proximity to Idaho Falls.

In addition to the reservoir, several of the larger tributaries upstream of the reservoir, as well as in Willow Creek downstream of the dam, provide recreational fishing opportunities.

**Reservoir Fishery**

Ririe Reservoir provides a mixed fishery of both cold water and warm water game species. The reservoir also includes many non-game species that compose the majority of the fish biomass in the reservoir. All species are listed on Table 2.1-9.

The game fish species were mostly established through stocking by IDFG. The only exception is yellow perch (*Perca flavescens*), which were illegally introduced in the 1980s but have established a self-sustaining population.

Currently, only rainbow trout (*Oncorhynchus mykiss*) and kokanee (*Oncorhynchus nerka*) are maintained by stocking programs, as the other gamefish naturally reproduce within the reservoir or tributaries. Yellowstone cutthroats (*Oncorhynchus clarki bouvier*) are largely confined to streams but a few do occur in the reservoir (pers. comm., J. Dillon, IDFG, Idaho Falls, ID, April 28, 1999). The non-game fish are not stocked and are considered to be overabundant, particularly the chubs (*Gila atraria*) (pers. comm., J. Dillon, Biologist, IDFG, Idaho Falls, ID, April 28, 1999). Bass (*Micropterus dolomieu*) were introduced to the reservoir to help control chub populations (IDFG 1996). To date, this effort has not proved successful as chubs and suckers (*Catostomus ardens*) are still abundant (pers. comm., J. Dillon, Biologist, IDFG, Idaho Falls, ID, April 28, 1999). Bass growth rates are very slow because of low water temperatures and the short growing season.

The reservoir fishery is open during the summer season only, except for an area within one mile of the dam which is open during the winter for ice-fishing. Sport fishing is mainly focused on hatchery rainbow trout, as they

**Table 2.1-9. Game and Non-Game Fish Species Found in Ririe Reservoir**

Common Name	Scientific Name
<b>Cold Water Game Species</b>	
Rainbow trout	<i>Oncorhynchus mykiss</i>
Brook trout	<i>Salvelinus fontinalis</i>
Brown trout	<i>Salmo trutta</i>
Kokanee salmon	<i>Oncorhynchus nerka</i>
Cutthroat trout	<i>Oncorhynchus clarkii</i>
<b>Warm Water Game Species</b>	
Smallmouth bass	<i>Micropterus dolomieu</i>
Yellow perch	<i>Perca flavescens</i>
<b>Non-Game Species</b>	
Utah chub	<i>Gila atraria</i>
Utah suckers	<i>Catostomus ardens</i>
Mountain suckers	<i>Catostomus platyrhynchus</i>
Redside shiner	<i>Notropis lutrensis</i>
Speckled dace	<i>Rhinichthys osculus</i>
Longnose dace	<i>Rhinichthys cataractae</i>
Mottled sculpin	<i>Cottus bairdi</i>

Source: Simpson and Wallace 1978

make up about 70 percent of the fish caught based on recent creel surveys (pers. comm., J. Dillon, Biologist, IDFG, Idaho Falls, ID, April 28, 1999). Yellow perch are the next most sought fish, making up about 20 percent of the sport catch. All the other gamefish account for the remaining 10 percent of the catch. Most of the sport fishing takes place in late spring through early fall. There is little opportunity for ice fishing on the reservoir, as the ice-over period is usually short (1 to 2 months) if at all in some years. When ice fishing is available, yellow perch are the primary species caught.

Spawning conditions for warm water game and non-game fish in the reservoir are generally good. Shoreline gravels, rocks, and vegetation usually remain inundated long enough for spawning, egg development, and fry emergence to occur. The cold water species primarily use the tributaries for spawning.

Rearing habitat conditions within the reservoir are generally good, even with reservoir drawdown operations, and adverse effects on the fishery are not known to occur. The reservoir has not yet become heavily eutrophic (high nutrient levels), and has relatively deep water refuge habitat available near the dam during periods of low pool levels. This, coupled with short or absent ice-over periods, has prevented low dissolved oxygen levels common to many western flood control and irrigation reservoirs. During summer, the pool level is maintained at relatively full levels, allowing stratification of the water column (a warm layer of water on top of a cool layer). This provides refuge habitat for cold water species during the warm summer months. In addition, no significant algae blooms occur during the summer that would contribute to poor water quality conditions.

During recent survey work, IDFG found that Utah chubs and suckers comprised almost 90 percent of their sampling catch (IDFG 1996). The problem with this overabundance is

that most of the available food supply for young fish, such as zooplankton, is probably being consumed by these non-game species. Therefore, this may be limiting the recruitment or growth of some of the game fish species (pers. comm., J. Dillon, Biologist, IDFG, Idaho Falls, ID, April 28, 1999). In addition, most of the game fish do not appear to be using the chubs and suckers as forage as indicated by recent diet samples (pers. comm., J. Dillon, Biologist, IDFG, Idaho Falls, ID, April 28, 1999). This means that little of the biomass in the reservoir is being translated into the sport fishery.

### ***Reservoir Tributary Fishery***

About 95 miles of streams are located in the Willow Creek drainage above Ririe Reservoir. All but a few of the major streams in the drainage eventually drain into Ririe Reservoir. Most of the streams are located in narrow canyons, with their flows varying from extremes of several thousand cubic feet per second (cfs) during runoff to becoming intermittent during the late summer and winter (IDFG 1996). The six major streams draining into the reservoir are as follows:

- Willow Creek
- Meadow Creek
- Tex Creek
- Grays Lake Outlet
- Brockman Creek (tributary to Grays Lake Outlet)
- Hell Creek (tributary to Grays Lake Outlet)

Tex Creek contains all or portions of these major streams, with the exception of Brockman and Hell Creeks, which are relatively far upstream in the Grays Lake Outlet system.

Most of the tributaries contain wild populations of Yellowstone cutthroat, brown trout (*Salmo trutta*), and brook trout (*Salvelinus fontinalis*). Yellowstone cutthroat trout are the species of primary focus for IDFG because they are the only native species of salmonids in the drainage.



Native cutthroat trout populations are currently depressed in the drainage, although they are believed to be viable (IDFG 1996). Overharvest and habitat degradation are believed to be contributing to the decline of this species (pers. comm., J. Dillon, Biologist, IDFG, Idaho Falls, ID, April 28, 1999).

Cutthroat and brown trout currently dominate the catch in tributaries, with hatchery catchable rainbow trout found in stocked areas near road access. No wild rainbow trout have been found in the Willow Creek drainage (IDFG 1996). The cutthroat trout harvest limit is a maximum of two per day; all fish that are between 8 and 16 inches must be released. This rule may have begun to restore cutthroat trout populations (IDFG 1996).

As noted, habitat degradation is believed to be a major contributor to the decline of Yellowstone cutthroat in the Willow Creek drainage. Dry land farming and grazing practices have denuded riparian vegetation within the upper watershed (IDFG 1996). As a result, groundwater inflow is virtually nonexistent in some areas and water temperatures vary widely, both daily and seasonally (IDFG 1996). Turbidity is high during the late winter and spring runoff and generally remains so until mid-summer.



Photo 2-7. Canyon lands as seen from Ririe Reservoir.

NRCS has identified the predominant soil series in the Willow Creek drainage area as one of the most erosive in the United States (IDFG 1996). A water quality program has been initiated to reduce loss of topsoil and improve the water quality of Willow Creek above Ririe Dam. Riparian habitat improvement through improved grazing management is a high priority on both State and private lands (IDFG 1996).

### ***Fisheries Management Considerations***

Within the reservoir, most of the fisheries management is concentrated on maintaining a viable sport fishery. The emphasis is on maintaining high game fish numbers in conjunction with high angler use and competition with non-game species. This goal is primarily addressed through stocking programs, because habitat in the reservoir is not considered a significant issue by IDFG. In the tributaries, however, habitat is the primary concern. Many of the riparian areas are heavily disturbed, and soil erosion and bank instability are severe along some streams. IDFG has identified objectives and programs to address these issues for Ririe Reservoir and the Reservoir tributaries (IDFG 1996). These programs are listed in Appendix C. Reclamation supports IDFG's objectives.

## **2.2 Visual Resources**

Ririe Reservoir is a long and narrow water body formed by an earthen dam at its north end approximately 250 feet high on Willow Creek. The reservoir is approximately 12 miles long and between approximately 500 and 2,000 feet wide. It lies within Willow Creek Canyon and is bounded on either shore by steeply sloping canyon walls. Consequently, the water body itself is generally not visible, except from locations within the canyon or at its edge. Ririe Dam and Reservoir are designed for flood control and the surface of reservoir fluctuates seasonally as much as 96 feet. At the higher

operational range, the reservoir has 32 miles of shoreline, which is reduced to 14.5 miles at low pool.

The canyon walls feature sagebrush and grasses with occasional stands of juniper. In some locations, the canyon walls display dramatic cliffs of columnar basalt that rise almost vertically from the water's surface. In others, pronounced benchlands make up the canyon walls. Side canyons at Meadow Creek and Blacktail Creek extend up to one mile from the mainstem of the reservoir. In other places, there are many shorter fingers as well. Dense, shrubby riparian vegetation is contained in numerous draws that drain into the reservoir.

Direct road access to the reservoir occurs at only two sites – Juniper Park and Blacktail Park. Juniper Park is located on a high escarpment at the north end of the reservoir on the east bank near the dam. The area is about 2 miles south of U.S. Highway 26 and is reached via a paved, two-lane road. A visitors center, day-use park, campground, and Reclamation's maintenance facilities are located in this area. In addition, a steeply sloping, paved access road and parking lot are cut into the canyon wall directly below the campground and terminate in a concrete boat ramp. The shorelines in this area are steep and rocky.

As visitors approach Juniper Park and enter the area, the maintenance facilities, including two buildings, several pieces of equipment, and a work yard enclosed by a chain-link fence, are readily visible, as is the park manager's mobile home. The visitors center consists of a low building set among many juniper trees. A parking lot is located in front of the trees. The day use park occupies the area surrounding the visitors center and, in addition to the juniper trees, features an irrigated lawn, sheltered picnic tables, barbecue grills, and pole-mounted lights. The juniper trees help separate the park into smaller use areas.

A few hundred feet to the south is Juniper Campground. The campground is arranged along two main loop roads through a loose stand of juniper trees. Individual campsites feature a parking spur, tent site, picnic table, and barbecue grill. Much like the day use area, the campground has an irrigated lawn and the juniper trees separate the campsites from one another.

Blacktail Park is located on the west side of the reservoir just north of Blacktail Creek and is reached by a paved, two-lane road. Unlike Juniper Park, the Blacktail area is situated inside a topographic bowl on a gentle slope extending directly back from the water's edge and is therefore visually isolated from other parts of the reservoir. The area consists of two large parking lots, a day use park with shaded picnic tables and barbecue grills on a large lawn area, a sandy swimming beach, a boat ramp, small marina with floating docks, boat fuel, and vault toilets. A small concession stand is located adjacent to the boat ramp. Blacktail Park offers the reservoir's only designated swimming beach, which is protected from boat traffic by a string of buoys. The only trees in the area are some young, very widely spaced shade trees planted as part of the day use area and some native riparian trees near the mouth of Blacktail Creek.

Benchlands, a third recreation area, is accessible by water only. It is located along the western shore of the reservoir between Juniper and Blacktail parks. The developed area at Benchlands consists of five shaded picnic tables with barbecue grills on a gentle slope adjacent to the shore. The picnic tables are set among an irrigated lawn. The shoreline consists of a sandy beach. The picnic shelters mimic those at Blacktail. Grades become much steeper uphill of the picnic area. As with Blacktail, the surrounding topography limits the visual exposure of this area. A floating toilet is located adjacent to the shoreline.

Other developed facilities on Ririe Reservoir include several floating day use platforms that are buoyed close to shore at various points along the full length of the reservoir. The platforms serve as tie-ups for boaters during the day as well as overnight moorage for those camping on their boats. At drawdown, most of the floats are beached along the exposed banks.

The vast majority of the lands within the canyon immediately surrounding the reservoir have a natural character that appears unaltered by human activity. In general, the only development visible within the canyon includes the access points and facilities described above, the dam itself, and an overhead powerline that spans the reservoir at a point about halfway between the Juniper and Blacktail access points.

When the reservoir is drawn down, the high water mark on the canyon walls surrounding the reservoir is clearly evident. This zone of inundation varies from the water's surface down approximately 93 feet depending on the extent of drawdown. At low pool, extensive mud flats are exposed. This is especially true adjacent to the Blacktail access area.

With the exception of one private residence on the east rim of the canyon less than one mile south of the dam, there is currently no residential use within proximity of the reservoir. Lands in the vicinity of the northern portion of the reservoir are used almost exclusively for agriculture (irrigated or dryland crops or grazing) or are managed for wildlife habitat.

The Tex Creek WMA surrounds the southern half of the reservoir and extends to the southeast approximately 10 miles. The topography within the WMA is comprised of a series of low hills and shallow valleys. From a visual standpoint, these conditions provide opportunities for impressive, long-distance

panoramas from the hilltops or ridges, and more intimate views of enclosed landscapes within the valleys. Throughout the extent of the WMA, a strong natural or rural appearance is evident. There is very little in the way of development. Human-made features that are visible to varying degrees include dirt roads and fences and an occasional farm building, elk-trap corral, or related structure. What little development there is remains visually subordinate to the area's natural-appearing characteristics.

The Cartier Slough WMA is located in the floodplain of the Henry's Fork of the Snake River. The topography within the WMA is predominantly flat, with relatively few trees, providing visitors opportunities for high quality waterfowl viewing. These same conditions also provide views of the surrounding landscape which is predominantly rural and agricultural in nature.



Photo 2-8. Low hills and shallow valleys of Tex Creek WMA.

There are no structures within the WMA and relatively few in the surrounding areas, further enhancing the rural appearance of the landscape. In sharp contrast to the agricultural landscape to the north and east of the WMA are views of the Menan Buttes, located 2 miles southwest. North and South Menan Buttes are two of the world's largest tuff cones and rise 800 feet from the surrounding plain. These buttes are the

dominant visual features to the south and west of the WMA.

## 2.3 Noise

Noise can be defined as the intensity, duration, and character of sounds from any and all sources. In general, the rural to primitive character of the RMP study area is reflected by low ambient noise levels. Noise sources that are present are primarily from motorized recreational activities on the reservoir, visitors at the various recreation areas, vehicular noise on nearby roadways, snowmobiles, firearms during hunting season, and nearby agricultural operations. The noise levels associated with these sources vary significantly depending on location, season, and time of day.

Of all the noise sources within the RMP study area, motorized recreational activities on the reservoir during the summer months and snowmobiles during the winter may be the most prevalent. Noise from PWC and motorized boats is reflected off the water and canyon walls of the reservoir, and depending on wind and weather conditions can be heard at locations far from their source. Snowmobiles are the primary noise source during the winter months and are heard primarily from within the Tex Creek WMA. At the present time, however, none of the noise sources within the RMP study area are known to be significantly disruptive to visitors or wildlife.

## 2.4 Cultural Resources

Evidence of human occupation in southeastern Idaho dates as early as 14,500 years before the present (B.P.). Three major prehistoric cultural periods have been identified for southeastern Idaho: the Early Prehistoric Period (15,000 to 7,500 B.P.), the Middle Prehistoric Period (7,400 to 1,300 B.P.), and the Late Prehistoric Period (1,300 to 150 B.P.). Sites excavated in the Ririe Reservoir area have yielded

diagnostic tools that indicate the study area was occupied for at least portions of the Middle and Late Prehistoric Periods.

In total, 35 cultural resource sites (including isolates) within the boundaries of the Ririe/Tex Creek RMP Study Area have been previously recorded on forms filed at the Idaho State Historic Preservation Office (SHPO). The sites include 29 archaeological sites and 6 historic structures or features. Within the boundaries of Tex Creek, an archaeological site and several historic structures (the red granary, the headquarters granary, and possibly others) exist but have not been officially documented on site forms. These sites are not included in the above count of historic structures.



Photo 2-9. Historic Red Granary at Tex Creek.

Most of the archaeological sites are deposits of prehistoric artifacts, usually obsidian, ignimbrite, and cryptocrystalline silicate (chert, jasper, or chalcedony) flakes produced in tool manufacture. Sometimes these artifacts are found associated with other stone tools (for example, manos, bifaces, and hammerstones), pieces of animal bone, or ceramic potsherds. Prehistoric site types include open prehistoric sites (lithic scatters), a toolstone quarry, rock shelters, and a surface depression resembling house pit features common at prehistoric village sites. Diverse cultural activities and widespread use of the study area in prehistoric times are reflected in the range of site types, site location/environmental association, and

variability in site size. Excavations at the Blacktail Park site, which yielded deeply stratified cultural deposits, indicate intensive prehistoric utilization of the study area over time.

Explorers and fur trappers first entered southeastern Idaho in the early 19th century. The major east-west travel route of the early Euroamerican explorers passed south of the RMP Study Area at Fort Hall and later became the Oregon Trail. Settlement in southeastern Idaho began in 1860. During the 1870s, gold discoveries brought miners to southeast Idaho. Although mining was not a significant factor in the RMP Study Area, settlers in the area worked in and provided supplies to the Caribou Mountain mining district about 45 miles to the southeast. Agriculture was and is the primary industry of settlers in southeastern Idaho, and irrigation systems were of signal importance to agricultural development of the area. Federal programs, including the Minidoka Project begun in 1904 by the Reclamation Service (later renamed the Bureau of Reclamation), provided a system of reservoirs for water storage, flood control, and power. The historic resources in the study area are represented by farmsteads and farm-related equipment and structures such as silos, sheds, corrals, dumps, cabins, and barns. Some of these sites have associated archaeological deposits.

Cultural affiliations of ethnohistoric groups in the study area are Northern Shoshone and Bannock. These two groups spoke different dialects of the Numic languages but lived together in winter villages on the upper Snake River. Shoshone and Bannock territory consisted primarily of southern Idaho, including the study area, with bands congregating along the Snake and other rivers. After acquiring horses, they ranged north into southern Alberta and east to the Black Hills to hunt bison and trade. The Fort Hall Reservation was established in 1867. The

length of time the Shoshone and Bannock Tribes have occupied southern Idaho is a subject of long-standing debate among scholars.

A Class I cultural resources inventory of the RMP Study Area indicates that these lands are rich in cultural resources. Only 5,000 to 7,000 acres of the estimated 30,000 acres in the study area have been previously surveyed. Of the cultural resource sites known in the study area, six are considered eligible for the National Register:

- Willow Creek Cabin (10BV181)
- Two lithic scatter sites (10BV24/69 and 10BV179)
- Meadow Creek Rockshelter (10BV22)
- Willow Creek Rockshelter (10BV32/36)
- Blacktail Park site (10BV48)

These sites (as well as a number of other sites that remain to be identified and evaluated for the National Register) have the potential to address research questions relating to early occupation of the study area. For example, questions of chronology, prehistoric/historic settlement, natural resource use, and prehistoric affiliations could be answered by investigations here.

Locations exist in the study area that may have traditionally served as plant and other resource collection areas and, as such, could constitute places of traditional cultural importance to the Shoshone-Bannock, Shoshone-Paiute, and possibly other Tribes. Tex Creek WMA contains draws and valleys that could have served as collecting areas for aboriginal peoples; these areas harbor willow, mint, choke cherries, sagebrush, and other collectible resources.

## 2.5 Sacred Sites

Sacred sites are defined in Executive Order 13007 as “any specific, discrete, narrowly delineated location on Federal land that is

identified by an Indian Tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion....”

Although no specific sacred sites have been identified in the study area, there are various natural features and locations on the study area landscape that would have held spiritual or religious significance to aboriginal Tribes. These places include mountains, foothills, buttes, springs, lakes, rivers, and rock shelters, among others. Specific site types in the study area that might require special attention by Reclamation in the future management of the RMP Study Area include altars; vision quest sites; water sources, springs, and headwaters; burial sites; historical places, for example, battlegrounds, rendezvous sites, sites where ceremonies occurred, and routes traveled by important persons; and others.

## 2.6 Indian Trust Assets

Indian Trust Assets (ITAs) are legal interests in property held in trust by the United States for Indian Tribes or individuals. The Secretary of the Interior, acting as the trustee, holds many assets in trust for Indian Tribes or Indian individuals. Examples of trust assets include lands, minerals, hunting and fishing rights, and water rights. While most ITAs are on-reservation, they may also be found off-reservation.

The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian Tribes or Indian individuals by treaties, statutes, and executive orders. These are sometimes further interpreted through court decisions and regulations.

The Shoshone-Bannock Tribes, a Federally recognized Tribe located at the Fort Hall

Reservation in Southeastern Idaho, have trust assets both on- and off-reservation. The Fort Bridger Treaty was signed and agreed to by the Bannock and Shoshone headman on July 3, 1868. The Treaty states in Article 4 that members of the Shoshone-Bannock Tribes “shall have the right to hunt on the unoccupied lands of the United States....” The Tribes believe their right extends to the right to fish. The Fort Bridger Treaty for the Shoshone-Bannock has been interpreted in the case of *State of Idaho v. Tinno*, an off-reservation fishing case in Idaho. The Idaho Supreme Court used the canon of construction to determine the Shoshone word for “hunt” also included to fish. Under *Tinno*, the Court affirmed the Tribal Members’ right to take fish off-reservation pursuant to the Fort Bridger Treaty (Shoshone-Bannock Tribes 1994).

Other Federally recognized Tribes, the Shoshone-Paiute Tribes of the Duck Valley Reservation, do not have recognized treaty rights outside their Executive Order Reservation (pers. comm., V. Peterson, Department of the Interior [DOI] Regional Solicitors Office, 3/12/97) but may have cultural and religious interests in the area of Ririe Reservoir. Certain interests of the Tribes may be protected under historic preservation laws and the Native American Graves Protection and Repatriation Act (NAGPRA). See Sections 2.3, Cultural Resources, and 2.4, Sacred Sites, for a discussion of other Tribal interests.

## 2.7 Socioeconomics

### 2.7.1 Demographic Profile

The population of Southeast Idaho is expanding at a rapid rate. The smaller communities near Ririe Reservoir are growing at a much faster rate than Idaho Falls, but their low base populations means that the actual numbers of new residents is relatively small. The Idaho National Engineering & Environmental Laboratory (INEEL) is one of several sites being considered

for development as a new Federal government space port, which would play an important role in affecting (i.e., increasing) the region's population.

Most of the RMP Study Area is within Bonneville County, which is typically considered one of six counties that comprise the region known as eastern Idaho. These counties include Fremont, Jefferson, Madison, Teton, Clark, and Bonneville. The population of eastern Idaho has increased 18 percent from 1990-2000. Bonneville County is the largest population center in the region with 56 percent of the population, totaling approximately 82,522. The population of Bonneville County increased by 14 percent between 1990 and 2000. Idaho Falls is the largest city in both the county and the region with 50,730 residents in 2000 and has experienced a 15 percent increase in population since 1990. The population of Bonneville County is 92 percent Caucasian. Average household size is 2.82 and the median age is 27.1.

Smaller cities in the area typically have higher growth rates. Rexburg, the second largest city in the region, had a 2000 population of 17,257 and grew by 21 percent between 1990 and 2000. The 2000 estimated populations of other towns in Bonneville County are Ammon (6,187), Iona (1,201), Ucon (943), and Ririe (545).

### **2.7.2 Economic Setting**

Idaho Falls is the County Seat of Bonneville County and the largest metropolitan area in the region. It is ringed by several smaller communities as well as numerous residential subdivisions outside of unincorporated areas. Ririe Reservoir is the closest large water recreation area to the City of Idaho Falls.

The primary employers in Bonneville County include general services, retail trade,

State/County government, wholesale trade, and construction. The largest employer in Idaho Falls is Bechtel B&W Idaho, a research and management services company. Although not located in Bonneville County, INEEL is an important regional employer in eastern Idaho. The INEEL, which employed more than 8,000 people at the end of 1996, is located on 890 square miles in the desert northwest of Idaho Falls. Other INEEL research and support facilities are located in Idaho Falls. Within the laboratory complex are nine major applied engineering, interim storage, and research and development facilities (Space Port Article, R. Barker 1999 Idaho Statesman).

The average per capita income in Bonneville County is \$20,110. This value represents only 82 percent of the national average but is slightly higher than the state average. Around 10 percent of county residents have incomes that are below the poverty line. Eighty-four percent of residents have a high school diploma. Adjacent counties have per capita incomes that are considerably lower. In Madison County, the average per capita income is \$12,697 while in Teton County it is \$12,471.