



## Chapter 2

# Existing Conditions

### 2.1 Natural Resources

#### 2.1.1 Climate and Air Quality

Cold winters and hot, dry summers characterize the semiarid climate in the RMP study area. The average high temperature of 91°F occurs in July and dips to an average low temperature of 19°F in January. The average precipitation is approximately 13 inches per year. Average monthly precipitation ranges from a high of 1.8 inches in November to a low of 0.2 inches in July. More than 75 percent of the precipitation falls between October and May. Irrigation is required in the Montour area because of the low precipitation rate during the growing season. The frost-free growing season averages 127 days. Table 2.1-1 summarizes the mean annual and seasonal precipitation records from 1948 to 2000.

Air quality is monitored by the Idaho Department of Environmental Quality (IDEQ) and the results are stored in a U.S. Environmental Protection Agency (EPA) database. Areas

with persistent air quality problems are noted in the database as nonattainment areas. No nonattainment areas are recorded by EPA in Gem County. Blowing dust is a concern in the RMP study area throughout the year during windy conditions, and especially during dry years.

#### 2.1.2 Topography and Geology

The topography of the Montour area is generally flat, with elevations ranging from a low point of 2,499 feet above mean sea level (amsl) to a high point of 2,550 feet amsl (see Photo 2-1). Most slopes within the valley are less than 5 percent. In Black Canyon, the gradient continues to be shallow, ranging from 2,520 feet amsl at the downstream edge of Montour Valley to 2,440 feet amsl at the base of the dam. The topographic feature of Regan Butte, located at the downstream end of the Montour Valley where Black Canyon and the reservoir begin, reaches a height of 3,340 feet amsl. Steeper slopes formed of dark-colored lava flows rise on the north and south sides of the Payette River through Black Canyon.

**Table 2.1-1. Precipitation summary (inches).**

	Mean Precipitation	Mean Snowfall
Annual	13.5	9.5
Winter (Dec – Feb)	5.0	8.3
Spring (Mar – May)	3.8	0.3
Summer (Jun – Aug)	1.5	0
Fall (Sep – Nov)	3.2	0.9

NOTE: Precipitation data are from Station 102942 near Emmett, ID. Seasons are climatological, not calendar seasons.



Photo 2-1. View of the reservoir, Triangle Park, and surrounding hills looking west as seen from the south side of the reservoir.

Slope and hydrography in the RMP study area are illustrated in Figure 2.1-1.

The Payette River flows generally westward in an arc along the northern side of Montour Valley, an intermontane basin. The flat floor of Montour Valley is underlain with recent age river-deposited alluvium to depths of several hundred feet. In most places on the valley floor, silty and sandy soils from about 5 to 10 feet deep cover the sand and gravelly alluvial materials (see Photo 2-2).

Closely bordering the northern and southern sides of the valley are low terraces composed of older alluvial deposits of silt, sand, and gravel. The gray to brown colored hills and ridges to the east and in some scattered places to the south and southwest of the valley are composed of granite from the Idaho batholith, which was formed during the late Cretaceous period approximately 65 to 85 million years ago. High mountain peaks and ridges to the

northeast and southwest of the valley rise more than 1,500 feet above the valley floor. These high ridges and peaks consist of basalt flows that overlay the granitic rocks. The basalt flows dip gently westward and are part of the Columbia River basalt flows, which erupted across most of eastern Washington and Oregon and parts of western Idaho between 14 and 17 million years ago.

At the downstream end of Montour Valley, the river enters Black Canyon, a deep, narrow gorge composed of dark basalt flows. These basalt flows are the Black Canyon member of the Weiser lobe of the Columbia River Basalt flows. Black Canyon is apparently made up of a single large volcanic flow, up to 330 feet thick.

The rocks throughout the RMP study area have been folded and faulted parallel to a northwesterly line by the Paddock Valley Fault System. This belt of activity is approximately 30 to 50 miles wide, and the Black Canyon fault zone is a southeasterly extension of this system. The faulting occurred at about the same time as the Columbia River Basalts were emplaced, and some faults occurred after the volcanic activity. The faults in the Black Canyon zone are not active.

### 2.1.3 Soils

The predominant soil series in the RMP study area are Bakeoven and Lickskillet extremely rocky soils, Gem stony clay loam, and Haw loam in the steep slope uplands, with Black Canyon silty clay loam and Moulton fine sandy loam on the flatter slopes adjacent to the River (NRCS 1965). Soils in the RMP



Photo 2-2. Panorama of Montour WMA with Regan Butte seen on the far left side of the photo.

Insert Figure 2.1-1. Slope and Hydrography.

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Back of Figure 2.1-1.

study area have formed under either shrub-steppe and grassland vegetation types or under hydrophytic vegetation types. Hydrophytic vegetation dominated soil types are found mostly along the Payette River. Underlying parent materials consist of alluvial deposits or of residuum derived from basalt. Residuum is unconsolidated, weathered, or partly weathered mineral material that has accumulated in place through disintegration of bedrock (basalt in this instance). Alluvial deposits are gradual additions to land along a river through deposition of sedimentary material, sand, or gravel.

Sediment is accumulating in the upper third of Black Canyon Reservoir from upstream sources along the Payette River (see Photo 2-3). Erosion and mass wasting following extensive fires in the drainage have contributed to sediment in the reservoir.



Photo 2-3. Confluence of Squaw Creek and the reservoir with rising sediment loads seen in the reservoir.

Soil depth varies across the RMP study area, but most soils are shallow above bedrock or sand/gravel horizons. Depth to loose or stratified sand and gravel ranges from 36 to 55 inches, mostly in those soils arising from alluvium along the river. For those shallow soils underlain by basaltic bedrock, the depth of soil ranges from as shallow as 4 inches to as deep as 36 inches. A few soil series have a hardpan at 35 to 50 inches composed of weakly cemented lime and silica. Soils in the

RMP study area vary from deep, fine sandy loams (low landscape positions) to extremely rocky, shallow soils (steeper upland positions). Subsurface materials range from loose sand and gravel to clay loam. Sand is the predominant subsurface material.

Scattered areas of high water table and salinity-affected soils can be found along the Payette River. Most soil shows negligible erosion; however, a few soil series have a slight to moderate risk of water erosion, although this problem is not widespread. Shrink-swell potential is low for the majority of soils in the RMP study area but moderate in some soils.

Erosion is most prevalent along the Black Canyon Reservoir shoreline from boat wake generated-wave action. The only location with an ongoing erosion problem is the shoreline at Black Canyon Park. Reclamation has attempted to protect the shoreline from additional erosion using rock riprap (see Photo 2-4). However, erosion continues on the north and south ends of the riprap area. If the erosion continues, trees growing above the eroding area may fall into the reservoir because of bank failure in the future.

## 2.1.4 Hydrology, Water Resources, Water Quality, and Contaminants

### 2.1.4.1 Hydrology and Water Resources

The study area is located on the Payette River, a major tributary to the Snake River in southwestern Idaho. Upstream of Black Canyon Reservoir, the Payette River meanders through a moderately wide valley bottom. This stretch of river supports numerous islands, some of which are the result of sediment deposition in the slackwater of Black Canyon Reservoir (Jankovsky-Jones 2001). Through the Montour WMA, old dikes, berms, and bars mostly inhibit water from entering the floodplains (Jankovsky-Jones 2001). Occasionally, low-lying old hay fields, wetlands, backwater



Photo 2-4. Riprap along the south side of Black Canyon Park.

sloughs and ditches, and wetland forest behind the dikes, berms, and bars are flooded during peak runoff events (Jankovsky-Jones 2001).

Black Canyon Reservoir is formed by an irrigation diversion dam near Emmett, Idaho. Black Canyon Reservoir also provides head for power generation. The reservoir has 1,100 surface acres and is about 6 miles long. The original capacity was 44,700 acre-feet. Sediment deposition has reduced the storage capacity of Black Canyon Reservoir and contributes to a generally high water table in the Montour Valley. At full pool, the reservoir storage capacity was 29,620 acre-feet in 1997 (Reclamation 1997).

The water table depth was calculated from measurements taken at 8 groundwater wells throughout the Montour WMA. Analysis of collected data revealed an average water table depth that currently varies from 11.7 feet at the northeast corner of the site to 3.2 feet at the western edge. Since the May 1984 Montour Wildlife/Recreation Management Plan was completed, the average depth to groundwater has decreased. Water table depths and associated observation wells are listed in Table 2.1-2 and shown in Figure 2.1-2.

#### 2.1.4.2 Water Quality/Contaminants

The Montour WMA, which is located above Black Canyon Reservoir, is a complex of wetlands and ponds adjacent to the Payette River that cover 1.7 square miles (1,105 acres). The

primary intent of the riparian areas and wetlands in the Montour WMA is to provide for food, cover, nesting, and resting habitat values for game and non-game species. The wetlands are not intended to improve water quality, although the benefits are inevitable. No wetland monitoring program to identify water quality improvements is in place. The Montour WMA will continue to be managed in compliance with its established intent, with management priorities focused on wildlife and habitat values as they relate to both game and non-game species.

Waterbodies are designated in Idaho to protect water quality for existing or designated uses. The Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 58.01.02) identifies Black Canyon Reservoir and the Payette River (from the confluence of the North Fork and South Fork Payette Rivers to Black Canyon Reservoir) as special resource waters and protects them for the following beneficial use classifications: cold water biota, salmonid spawning, primary contact recreation, and domestic water supply.

Black Canyon Reservoir is water quality limited for nutrients, oil or gas, and sediments, and is therefore on Idaho's 303(d) list (IDEQ 1998). Reclamation analyzed water quality samples on the north side of the spillway on Black Canyon Reservoir and below Squaw Creek in June 1997 and June 2000.

The Idaho Department of Environmental Quality (IDEQ) is in the preliminary stages of developing load assessments for sections of the Payette River above Black Canyon Reservoir. The establishment of Total Maximum Daily Loads (TMDLs) for this section of the Payette River is scheduled for December 2004. In addition to the reservoir, from the Black Canyon Dam to the Snake River, the Payette River is 303(d) listed for nutrients, bacteria, and temperature. This is primarily

**Table 2.1-2. Observation wells and water depth (feet).**

Observation Well	May 1984 Plan	Reclamation Monitoring Data (1998-2002)
BAC1 (water is pumped to campground)	4.2	10.0
BAB1	1.2	4.8
CCC1	0.5	3.2
DCB1	no data	5.3
DAA2	1.7	4.9
BDB1	5.1	11.7
ADB1	0.9	5.2
BCC1	no data	5.2

Source: Reclamation 1984 and Reclamation monitoring data.

because of irrigation return flows below the dam. TMDLs for sediment and bacteria on the Lower Payette River were approved by EPA in 2000 (IDEQ 2001).

Existing impacts to water quality include increased sedimentation of the reservoir and suspended sediments from shoreline erosion; oil and gasoline spills and bypassed unburned fuel from motorized boating and personal watercraft (PWC); suspended sediments, nutrients, and pesticides from agricultural wastewater; and suspended sediment runoff from lands located higher in the watershed.

### 2.1.5 Vegetation

Vegetation and plant communities within the RMP study area have been modified from the original native composition by farming, construction of irrigation projects, recreation, livestock grazing, and other human uses, as well as the shallow groundwater resulting from the reservoir. Native plant communities occurring in the area include the following:

- Riparian and wetland habitat along the Payette River and its tributaries.
- Small areas of upland vegetation that have not been converted into agriculture.
- Natural and created wetland areas that are maintained or supported by irrigation and drainage systems and shallow groundwater levels.

Vegetation species in the RMP study area are listed in Table 2.1-3, and vegetation associations are mapped in Figure 2.1-2. Details about these species and their role and occurrence in the RMP study area are provided in Section 2.1.5.1, *Cover Type*. Potential vegetation management issues for sensitive species are provided in Section 2.1.5.2, *Vegetation Management and Invasive Species*.

#### 2.1.5.1 Cover Types

The water level of Black Canyon Reservoir is typically maintained within 0.1 feet of full pool (2,497.5 feet) during the irrigation season to ensure full diversion capability. The irrigation season coincides with the growing season for riparian vegetation, and the constant full pool has resulted in a fairly consistent band of riparian vegetation along much of the reservoir shoreline. Many species that occur for the Payette River also occur along the reservoir.

The dominant riparian species growing along the reservoir shoreline is the exotic false indigo. This species is quite aggressive and in many areas has completely displaced native willows and other native species along the reservoir shoreline. Riparian habitat along the Payette River and its tributaries and islands is dominated by black cottonwood and the non-native black locust and silver maple (see

**Table 2.1-3. Occurrence of vegetation species in the RMP study area.**

Cover Type and Location	Common Name	Scientific Name	Native	Non-Native	Noxious Weed
<b>Riparian Vegetation—Payette River, Tributaries, and Black Canyon Reservoir Shoreline</b>					
	black cottonwood	<i>Populus trichocarpa</i>	X		
	black locust	<i>Robinia pseudoacacia</i>		X	
	false indigo	<i>Amorpha fruticosa</i>		X	
	Douglas hawthorn	<i>Crataegus douglasii</i>	X		
	netleaf hackberry	<i>Celtis reticulata</i>	X		
	peachleaf willow	<i>Salix amygdaloides</i>	X		
	sandbar willow	<i>Salix exigua</i>	X		
	silver maple	<i>Acer saccharinum</i>		X	
	red-osier dogwood	<i>Cornus stolonifera</i>	X		
	rose	<i>Rosa sp.</i>	X		
<b>Upland Vegetation</b>					
Campgrounds					
	blackberry	<i>Rubus leucodermis</i>		X	
	black locust	<i>Robinia pseudoacacia</i>		X	
	catalpa	<i>Capalpa speciosa</i>		X	
	silver maple	<i>Acer saccharinum</i>		X	
	lawn species	Various		X	
	shade trees	Various		X	
Montour WMA					
	balsamroot	<i>Balsamorhiza sagittata</i>	X		
	big sagebrush	<i>Artemisia tridentata</i>	X		
	bitterbrush	<i>Purshia tridentata</i>	X		
	bluebunch wheatgrass	<i>Agropyron spicatum/Pseudoregneria spicata</i>	X		
	common camas	<i>Camassia quamash</i>	X		
	downy brome	<i>Bromus tectorum</i>		X	
	rabbitbrush	<i>Chrysothamnus spp.</i>	X		
	rush skeletonweed	<i>Chondrilla juncea</i>			X
	squirreltail	<i>Sitanion hystrix</i>	X		
<b>Wetland Species—Montour WMA</b>					
Ponds and natural and constructed wetlands					
	blackberry	<i>Rubus leucodermis</i>		X	
	black cottonwood	<i>Populus trichocarpa</i>	X		
	blue mustard	<i>Chorispora tenella</i>		X	
	bristly foxtail	<i>Setaria verticillata</i>		X	
	bulrushes	<i>Scirpus spp.</i>	X		
	Canada thistle	<i>Circium arvense</i>			X
	cattail	<i>Typha latifolia</i>	X		
	chicory	<i>Chichorium intybus</i>		X	
	cloaked bulrush	<i>Scirpus pallidus</i>	X		
	dogfennel	<i>Anthemis cotula</i>		X	

**Table 2.1-3. Occurrence of vegetation species in the RMP study area.**

Cover Type and Location	Common Name	Scientific Name	Native	Non-Native	Noxious Weed
	blue elderberry	<i>Sambucus cerulea</i>	X		
	false indigo	<i>Amorpha fruticosa</i>		X	
	golden currant	<i>Ribes aureum</i>	X		
	hound's tongue	<i>Cynoglossum officinale</i>			X
	orchard grass	<i>Dactylis glomerata</i>		X	
	peachleaf willow	<i>Salix amygdaloides</i>	X		
	poison hemlock	<i>Conium maculatum</i>			X
	purple loosestrife	<i>Lythrum salicaria</i>			X
	reed canarygrass	<i>Phalaris arundinacea</i>		X	
	rush skeletonweed	<i>Chondrilla juncea</i>			X
	rushes (many species)	<i>Juncus</i> spp.	X		
	Russian olive	<i>Elaeagnus angustifolia</i>		X	
	sandbar willow	<i>Salix exigua</i>	X		
	sedges (many species)	<i>Carex</i> spp.	X		
	smooth brome	<i>Bromus inermis</i>		X	
	smooth scouringrush	<i>Equisetum laevigatum</i>	X		
	sowthistle	<i>Sonchus arvensis</i>		X	
	spotted knapweed	<i>Centaurea maculosa</i>			X
	teasel	<i>Dipsacus fullonum</i>		X	
Irrigation and drainage systems					
	watercress	<i>Rorippa nasturtium aquaticum</i>	X		
	speedwell	<i>Veronica americana</i>	X		
	duck weed	<i>Lemna</i> spp.	X		

Source: Compilation of available data by CH2M HILL, 2003.

Photo 2-5). False indigo also occurs as an understory species at many locations with black locust. Some areas still have healthy stands of native species. Nettleleaf hackberry, peachleaf willow and sandbar willow, Douglas hawthorn, red-osier dogwood, and rose are the common native shrubs along the river. Vegetation in recreation areas is composed of non-native lawn species and shade trees (see Photo 2-6). Tree species, such as silver maple, black locust, and catalpa, are typical. These trees are often very large and offer some structural habitat for bird species within the campgrounds. Non-native blackberries are the dominant shrub along the margins of several campgrounds. Vegetation on the Montour



Photo 2-5. Dense areas of riparian vegetation can be seen adjacent to the Payette River as it meanders through the WMA. Upland shrub-steppe vegetation appears in the foreground and on Regan Butte in the distance.



Photo 2-6. Maintained grass and shade trees at Wild Rose Park.

WMA is highly variable depending on past and present land uses, depth to groundwater, and the development of wetlands for waterfowl and other wildlife. The WMA is located on the floodplain of the Payette River and has always been subject to flooding during years of high spring runoff. The Montour WMA was settled and farmed prior to construction of Black Canyon Dam. Construction of the dam resulted in a gradual rise in elevation of yearly and major floods and exacerbated the flooding problem and raised the ground water level under the area.

Some areas of the Montour WMA are farmed. Reclamation enters into cooperative agreements with local farmers whereby they agree to leave a portion of their crop either unharvested or standing to provide food and/or cover for wildlife, especially pheasants and quail. The rest of the area is managed to provide breeding habitat and permanent winter cover for a variety of wildlife species. The shallow groundwater supports wetland species in many areas (see Photo 2-7). These include native species, such as black cottonwood, sandbar willow, peachleaf willow, smooth scouring rush, and cloaked bulrush, but large areas have been invaded by reed canarygrass (see Photo 2-8). IDFG, in cooperation with Reclamation, has constructed approximately 47.7 acres of ponds. These wetlands and other wet areas, such as ditches, have cattails, bul-

rushes and sedges. Noxious weeds, especially purple loosestrife are a problem in these areas because of the presence of surface water.

Montour WMA has some areas where native species (such as elderberry, golden currant, black cottonwood, Douglas hawthorn, dogwood, and willows) are thriving, but much of this area is dominated by exotics. Some of these non-native species (such as apple trees, black locust, Russian olive, orchard grass, and smooth brome) were probably originally planted and have spread. Others (such as Canada thistle, spotted knapweed, hound’s tongue, poison hemlock, rush skeletonweed, teasel, blue mustard, chicory, purple loosestrife, and sowthistle) are invaders that are able to spread rapidly. Other invaders that have already become established are reed canarygrass, false indigo, bristly foxtail, downy brome, and dogfennel.

Several species of plants are found mainly along the irrigation and drainage systems, including watercress, speedwell, and duck weed.

Upland native vegetation is dominated by big sagebrush, bitterbrush, and rabbitbrush. Upland understory species include bluebunch wheatgrass, squirreltail, and balsamroot. In many areas, especially along roadways, upland areas have been invaded by downy brome and rush skeletonweed.



Photo 2-7. Cattails and other wetland species in one of the WMA ponds.

Insert Figure 2.1-2. Vegetation Associations.

Back of Figure 2.1-2.

### 2.1.5.2 Vegetation Management and Invasive Weeds

Vegetation management issues of concern include the spread of invasive and noxious weeds, the maintenance and enhancement of plant species diversity and quality wildlife habitats, and the protection of sensitive plant species of concern. The most crucial vegetation management issue is weed suppression. Noxious and other invasive weeds can reduce species diversity both in the plant communities where they invade and in the wildlife species using those communities. Weed treatment issues are particularly challenging on the WMA because of the abundance of water in the area. Herbicide use near water, or in areas where the water table is high and groundwater could be contaminated, is severely restricted and prohibited for some herbicides. However, herbicides have been the primary method of weed control. Other options, such as mechanical or biological controls, must be used to enhance water-approved herbicides.

Noxious weeds that have been found at Montour and Black Canyon are shown in Table 2.1-4. The highest priority for weed control is to prevent the establishment of new species. Small infestations of weeds such as leafy spurge, spotted knapweed, and whitetop have been successfully controlled or eradicated. Canada thistle and poison hemlock, which thrive in the moist soil conditions at Montour, are the most widespread species. Long-term efforts to control these species are beginning to show moderate success, although complete eradication will be a major long-term effort if even feasible.

Recently, Eurasian watermilfoil has been found in the three constructed ponds at Montour and is spreading rapidly. This highly invasive aquatic weed has the potential to completely dominate open water areas if left unchecked, and there is much concern of it spreading to the downstream watershed. Chemical control of this weed began in the summer of 2003 and will continue in 2004.



Photo 2-8. Constructed wetland on previously farmed land in the WMA surrounded mainly by reed canarygrass.

**Table 2.1-4. Noxious weeds found within the RMP study area.**

Common Name	Scientific Name
Canada thistle	<i>Cirsium arvense</i>
poison hemlock	<i>Conium maculatum</i>
purple loosestrife	<i>Lythrum salicaria</i>
spotted knapweed	<i>Centaurea maculosa</i>
rush skeletonweed	<i>Chondrilla juncea</i>
leafy spurge	<i>Euphorbia esula</i>
hoary cress (whitetop)	<i>Cardaria draba</i>
Scotch thistle	<i>Onopordum acanthium</i>
perennial pepperweed	<i>Lepidium latifolium</i>
puncturevine	<i>Tribulus terrestris</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
purple loosestrife	<i>Lythrum salicaria</i>

Source: Gem County Weed Control  
 Judy Ferguson, CH2M HILL, observation in field.

Reclamation has funded Gem County Weed Control through financial assistance agreements to control noxious weeds at Montour and Black Canyon Reservoir for several years. Annual funding has ranged from approximately \$3,000 to \$10,000 and has increased in recent years. The RMP study area is also within the Upper Payette Cooperative Weed Management Area (CWMA). This organization consists of three county weed control agencies, several State and Federal agencies, and private landowners who are working cooperatively to control noxious weeds throughout the upper Payette River watershed (see Photo 2-9). These participating agencies and individuals have provided financial and in-kind assistance for weed control at Montour through donated labor and equipment.

2.1.5.3 Species and Habitats of Concern

**Rare Species**

Idaho lists five plant species of concern that potentially occur in Gem County (see Table 2.1-5). These are discussed in the following text along with habitat requirements. Federally designated species are addressed in Section 2.1.8.

**Aase’s Onion**

Aase’s onion is endemic to southwestern Idaho, where it is restricted to the lower foothills between Boise and Emmett, plus two disjunct populations near Weiser (Mancuso 1995). Aase’s onion is restricted to a narrow set of habitat conditions consisting of open, relatively barren, xeric, sandy slopes that range from gentle to very steep. Aspects are usually southerly. This onion is primarily associated with sparsely vegetated bitterbrush or bitterbrush/sagebrush communities.



Photo 2-9. Educational sign on weeds located at one of the highway boat ramps.

**Table 2.1-5. Gem County species of concern.**

Common Name	Scientific Name	Global Rank	State Rank
Aase's onion	<i>Allium aaseae</i>	G3	S3
Tolmie's onion	<i>Allium tolmiei</i> var. <i>persimile</i>	G4	S3
Cusick's camas	<i>Camassia cusickii</i>	G4	S2
Shining flatsedge	<i>Cyperus rivulairs</i>	G5	S2
Slickspot peppergrass	<i>Lepidium papilliferum</i>	G2	S2

G = Global rank indicator; denotes rank based on range-wide status

S = State rank indicator; denotes rank based on status within Idaho.

1 = Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences)

2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences)

3 = Rare or uncommon but not imperiled (typically 21 to 100 occurrences)

4 = Not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences)

5 = Demonstrably widespread, abundant, and secure

Source: Idaho CDC, <http://www2.state.id.us/fishgame/info/cdc/cdc.htm>

Q = Indicates uncertainty about taxonomic status

U = Unrankable

Two main factors contribute to the serious conservation concern for this onion. One factor is that it has a very limited distribution and restricted habitat. The other is that it is located adjacent to a major population center. Both of these cause concern and subject this species to numerous threats (Moseley and Caicco 1989). Potential habitat for this onion within the RMP study area would be in bitterbrush or sagebrush-bitterbrush upland habitat with sandy soils.

### Tolmie's Onion

Tolmie's Onion is found on dry, open ground. It usually occurs on rocky, gravelly, or clay soils. It arises from oval bulbs, which are often clustered. Tolmie's onion is found from southeastern Washington and western Idaho to northeastern California. This variety of Tolmie's onion is a narrow endemic which is found mainly in Adams County, Idaho, in the southern Seven Devils Mountains. There are a few disjunct populations in Gem and Washington counties on U.S. Forest Service (USFS) land (Moseley and Mancuso 1990). Potential habitat for Tolmie's onion would be in upland habitat.

### Cusick's Camas

This lily occurs on steep, moist slopes and terraces that are spring fed or have slow moving water. It is larger and more robust than common camas and generally has lighter blue flowers. Its distribution includes the Snake River canyon area and tributaries in Adams, Gem, and Washington counties. It also occurs in Baker County, Oregon, and close to the southern rim of Hell's Canyon near McGraw Lookout. This camas is most likely to occur in moist to wet meadow habitat on steep slopes or terraces and in lowland sites along water (Atwood and DeBolt 2001).

### Shining Flatsedge

This annual member of the sedge family is a rare obligate wetland plant in the Northwest. It occurs most often in wetlands across the eastern United States. When it does occur, it is often in wet areas at lower elevations. Jankovsky-Jones (2001) identified this flatsedge on the Montour WMA.

### Slickspot Peppergrass

Habitat for slickspot peppergrass consists of openings in sagebrush stands that are protected from wind, but not from sun. The surrounding sagebrush-shrub communities are

generally on well-drained soil, but the microsites (openings) in which slickspot peppergrass occur are much higher in clay than the surrounding sites. This species is restricted to “slickspots” with a clay layer that is able to hold water. These small-scale habitat microsites range in size from less than 1 square meter to approximately 10 square meters (Mancuso and Moseley 1998).

The main distribution range of slickspot peppergrass is the western Snake River Plain and adjacent northern foothills in Payette, Gem, Canyon, Ada, and Elmore counties in Idaho. It occurs in semiarid, sagebrush-steppe ecosystems in this region of southern Idaho on the volcanic plains of both the Snake River Plain and Owyhee Plateau and in adjacent foothills. All occurrences of slickspot peppergrass are on or adjacent to volcanic plateaus underlain by basalt or rhyolite (Moseley 1994).

Reclamation-administered land surrounding Black Canyon Reservoir and Montour WMA contains a relatively narrow fringe of sagebrush-steppe habitat, and most of these areas are on relatively steep slopes that are generally poorly suited for slickspot peppergrass. While no specific surveys have been conducted, it is unlikely that slickspot peppergrass occurs within the RMP study area.

### **Designated Critical Habitat**

No designated critical habitats for rare and sensitive plant species occur within the RMP study area. One such species, shining flatsedge, is known to occur on the Montour WMA (Jankovsky-Jones 2001). Cusick’s camas populations occur on steep moist slopes in this area of Gem County. Such areas are unlikely to occur within the RMP study area. No other rare plant species are known to occur within the study area, and none were noted during limited-scope field visits. However, most of the plant species of concern are

known to inhabit similar settings to native upland, riparian, and wet meadow habitats within the RMP study area.

### **Rare Plant Communities**

The Idaho Conservation Data Center (CDC) conducted a study in 2001 to identify rare wetland plant associations with the western Snake River and its major tributaries, including the Payette River (Jankovsky-Jones 2001). Plant associations represent repeating assemblages of plant species that occur in response to complex environmental factors. Table 2.1-6 presents the rare plant community occurrences identified at the Montour WMA.

### **2.1.6 Wildlife Resources**

Portions of this existing conditions discussion are taken from the 1984 Montour Wildlife/Recreation Area Management Plan (Reclamation 1984), when that information still represented current conditions. This information was supplemented by site visits and personal observations by biologists and discussions with Reclamation and IDFG biologists.

The Payette River Wildlife Management Plan (IDFG undated) provides a list of wildlife species known to occur on the Payette River WMA during one or more seasons of the year. Given its proximity to Black Canyon Reservoir and the Montour area, and the similarity of habitats present at the two areas, these same species would be expected to occur in the RMP study area. The list includes 198 species of birds, 60 mammals, 16 reptiles, and 7 amphibians.

Specific elements of the RMP related to habitat development and management at Montour will serve as the WMA management plan for Reclamation and IDFG. Specific goals are expected to be similar to those of the Payette River Wildlife Management Plan that covers lands and islands along the Payette River

**Table 2.1-6. Montour Wildlife Management Area rare plant communities.**

Community Type and Scientific Name	Common Name and Description	Global Rank*	State Rank*
<i>Salix exigua/barren</i>	coyote willow/barren	G5	S4
<i>Distichlis stricta</i>	interior saltgrass (at least 25% cover of this species)	G5	S4
<i>Carex lanuginosa</i>	woolly sedge (this is the dominant species with > 25% cover)	G3	S2
<i>Carex nebrascensis</i>	Nebraska sedge (this is the dominant species with > 25% cover)	G4	S3
<i>Carex praegracilis</i>	clustered field sedge (this species alone or with other graminoids > 25% cover)	G2, G3, Q	S2
<i>Eleocharis palustris</i>	creeping spikerush (this is the dominant species with > 25% cover)	G5	S3
<i>Juncus balticus</i>	baltic rush (this is the dominant species with > 25% cover)	G5	S5
<i>Typha latifolia</i>	common cattail (this species alone or with <i>T. angustifolia</i> with > 50% cover)	G5	S4
<i>Scirpus validus</i>	softstem bulrush (this is the dominant species with > 25% cover)	G4	S2
<i>Populus trichocarpa/rosa woodsii</i>	black cottonwood/wood's rose (> 25% cover of rose)	G4	S3
<i>Salix lasiandra/mesic forb</i>	whiplash willow/mesic forb (mesic forbs include <i>Euthamia occidentalis</i> , <i>Urtica dioica</i> , <i>Verbena hastata</i> , <i>Lycopus asper</i> , <i>Smilacina stellata</i> , and others)	G?	S2
<i>Eleocharis rostellata</i>	wandering spikerush (this is the dominant species with > 25% cover)	G2	S2
<i>Juncus effusus</i>	common rush (this is the dominant species with > 25% cover)	GU	SU

Source: Jankovsky-Jones 2001

\*See Table 2.1-5 for explanation of global and state rank

below Emmett, Idaho. The overall mission statement reads as follows: “The mission of the Payette River WMA is to provide sustained and enhanced wildlife populations and habitat, especially for waterfowl and upland game birds, and to provide the public with a variety of wildlife-oriented outdoor recreational opportunities.”

Wildlife use forested and scrub-shrub riparian communities disproportionately more than any other habitat (Thomas 1979). Thomas reported that 285 of 378 terrestrial species known to occur in the Blue Mountains of northeastern Oregon are either directly dependent on riparian zones or use them more than other habitats. Riparian habitats within the Black Can-

yon/Montour RMP area are also extremely valuable for wildlife, including neo-tropical migrant birds, raptors, upland game birds, waterfowl, furbearers, mule and whitetail deer, small mammals, and amphibians.

Wildlife present in the RMP study area include 13 mammalian predators and fur bearers including river otters in the Payette River. The Payette River WMA management plan indicates that 10 species of bats occur in that area. All would be expected to occur in the RMP study area. Several of these are considered to be sensitive species by the BLM, and are noted later in this section. The Payette River WMA management plan lists 17 species of eagles and hawks and 8 species of owls in the

area (see Photo 2-10). Thirty-five species of waterfowl, wading birds, shorebirds, and other water-related species have been reported, along with 8 woodpecker species. More than 100 species of migratory songbirds are listed as being present in the Payette River WMA area (IDFG undated). Of particular concern is the presence of introduced bullfrogs (*Rana catesbeiana*) because of their ability to eliminate native amphibians, which are suffering population declines on a global scale (Kiesecker et al. 2001). IDFG has indicated that bullfrogs are present in the wetlands at Montour.



Photo 2-10. Hawk perched on a power pole in Montour WMA.

Executive Order 13186 defines the responsibilities of Federal agencies to protect migratory birds under the four Migratory Bird Treaties (MBT Conventions) to which the United States is a signatory. Most birds in North America are considered migratory under one or more of the MBT Conventions. The Executive Order mandates that all Federal agencies cooperate with the U.S. Fish and Wildlife Service (FWS) to increase awareness and protection of the nation’s migratory bird resources. Each agency is supposed to have developed a Memorandum of Understanding (MOU) with FWS stating how it intends to cooperate. Reclamation is in the process of finalizing an

MOU with FWS, which includes provisions for analyzing Reclamation’s effect on migratory birds.

Natural and man-made wetlands in the Montour WMA provide important habitat for many species of wildlife, including shorebirds, waterfowl, songbirds, and furbearers such as weasels and mink. The wetlands on the west end of the valley are of particular importance to waterfowl. Approximately 170 acres of open ponds and natural wetlands extend in a north-south direction between the Payette River on the west and the agricultural lands on the east. Human use in the immediate vicinity of wetlands has historically been restricted from February 1 to July 1 to protect breeding wildlife and duck broods.

The highest number of waterfowl typically use the agricultural croplands of Montour during spring migration. Numbers vary from year to year, but 4,000 to 5,000 ducks and geese in the Montour area at this time are not uncommon. Canada geese nest and graze on portions of the higher sites surrounding this wetland and along the Payette River (see Photos 2-11 and 2-12). The Montour area and the nearby Payette River are major producers of Canada geese (pers. comm., Tim Shelton, June 4, 2002). Huntatable populations of ring-necked pheasants and California quail occur in the Montour area (see Photo 2-13). Recently,



Photo 2-11. Canada geese and other waterfowl in the WMA wetlands/ponds.

1,300 to 1,400 pen-raised pheasants have been released annually from the end of October through the end of the year to meet the ever-increasing demand from hunters. Few of these pen-raised pheasants survive the winter. Food plots that are planted to support pheasants also provide food for deer and several species of small mammals and birds.

Past cattle grazing reduced much of the woody and herbaceous vegetation needed for food and residual cover by wildlife at Montour. However, most of the grazing was discontinued in 2000, allowing more residual herbaceous cover and permanent woody cover to remain, which improves nesting habitat for all non-game species as well as for upland game birds and waterfowl. The grazing that does remain is limited to 35 cow/calf pairs that are on the site from May until mid-September.

The sagebrush-grass community that borders the south side of the valley adds to the vegetation diversity of the area. Many species of wildlife, including mule deer and a variety of birds and mammals, inhabit this area. Mule deer winter on the southern portion of Squaw Butte and most stay north of Black Canyon Reservoir. A small number of migrants from big game units 32 and 32A move across the Black Canyon Reservoir toward lands to the south each winter. A few deer fall through the ice and drown in the reservoir each year, but this has not been a serious problem (pers. comm., Tim Shelton, June 4, 2002). Several mule deer are killed by vehicles each winter as



Photo 2-13. Ring-necked pheasant.

they attempt to cross Highway 52, which follows the north side of the reservoir. A small resident herd of about 25 whitetail deer are also in the area. A few mountain lions would be expected in the area during the winter when deer are concentrated. The sagebrush-grass community also provides escape cover for pheasants during the fall and winter months. Habitat quality on most of the uplands has been substantially reduced by livestock grazing.

The presence of noxious and invasive weeds has degraded wildlife habitat values in heavily infested portions of wetland and riparian areas as well as on uplands. The potential for additional severe degradation of habitat value is substantial. Noxious and invasive weeds that occur in the RMP area are discussed in Section 2.1.5, *Vegetation*.

#### 2.1.6.1 Sensitive Species

There are several wildlife species considered sensitive (but not Federally listed) that potentially occur in the RMP study area, as addressed below.

##### Yellow Billed Cuckoo

The Yellow-billed cuckoo (*Coccyzus americanus occidentalis*) is a neotropical migrant species that breeds in North America and winters primarily south of the U.S.-Mexico border.



Photo 2-12. Goose on a nest box in the WMA.

A petition to list this species for protection under the Endangered Species Act (ESA) was filed in 1998. The petitioners stated that habitat loss, overgrazing, tamarisk invasion of riparian areas, river management, logging, and pesticides have caused declines in the numbers of yellow-billed cuckoos. The yellow-billed cuckoo was given status as a Candidate species for protection under the ESA. The Idaho CDC lists the status of the yellow-billed cuckoo in Idaho as S1 or critically imperiled. It is also a BLM sensitive species.

Cuckoos favor areas with a dense understory of willow (*Salix* spp.) combined with mature cottonwoods (*Populus* spp.), generally within 100 meters of slow or standing water. They feed on insects, mostly caterpillars, but also beetles, fall webworms, cicadas, and fruit (especially berries). Potentially suitable cuckoo habitat exists on the Montour WMA and on islands in the Payette River. The predominance of false indigo in the riparian zone along the shoreline of much of Black Canyon Reservoir probably precludes yellow-billed cuckoo use of these areas. No surveys have been conducted to determine its status in the area.

### **Northern Goshawk**

Northern goshawks (*Accipiter gentilis*) are listed as sensitive species by the USFS and BLM. Hayward and Escano (1989) studied and described northern goshawk nesting habitat in western Montana and northern Idaho.

No goshawks are known to nest in the RMP area. However, they do use forested areas along the reservoir and especially along the Payette River and at Montour during migration and winter. Forested stands provide high quality foraging and roosting habitat, and the low levels of human activity during the winter would be attractive to goshawks.

### **Ferruginous Hawk**

The ferruginous hawk (*Buteo regalis*) population is declining throughout its range, and this species is listed as sensitive by both the USFS and BLM. Ferruginous hawks are especially sensitive to human disturbance early in the nesting period, when disturbance often results in nest abandonment. They are found in open habitats, such as grassland, shrub-steppe, sagebrush, deserts, saltbush-greasewood shrublands, and outer edges of pinyon-pine and other forests. Ferruginous hawks are not known to nest in the vicinity of the RMP area but might forage in the Montour area during spring or fall migration or if any pairs nest nearby.

### **Long-Billed Curlew**

Long-billed curlew (*Numenius americanus*) were heard at Montour by biologists during spring 2002. It is possible that this species is breeding in the Montour WMA, because they are known to breed on nearby BLM lands. Wet meadows present within the Montour WMA provide high quality foraging habitat for curlews, although curlews also forage in other habitats. This species is listed as sensitive by both the USFS and BLM and has an S3 ranking by the Idaho CDC.

### **Spotted Frog**

The spotted frog (*Rana luteiventris*) population south of the Snake River is considered to be part of the Great Basin population. This subpopulation of the Columbia spotted frog is a candidate for listing under the Endangered Species Act (Reclamation 1998). Columbia spotted frogs that may occur at Montour WMA are not part of the candidate Great Basin Population. However, all populations of spotted frogs are believed to be declining because of the loss and degradation of habitat, water diversion, livestock grazing, spring development for livestock, and competition with and predation by exotic species such as large-

mouth bass and bullfrogs (Reclamation 1998), both of which are present in Montour wetlands. General declines in Western amphibian populations have also been attributed to pathogen outbreaks linked to climate-induced changes in ultraviolet light exposure (Kiesecker et al. 2001).

The Payette River Wildlife Management Plan lists the spotted frog as one of the amphibians that occurs downstream of Black Canyon Dam. However, no field surveys have been conducted to verify this occurrence, nor have surveys been conducted on the Montour WMA. The Idaho CDC does not list the spotted frog as occurring in Gem County. Its status in the RMP area is uncertain.

**Bat Species**

As noted earlier, six species of bats that likely occur in the RMP study area are considered to be sensitive by the BLM. These species, and their State rank by the Idaho CDC, are shown in Table 2.1-7.

**2.1.7 Aquatic Biology**

The RMP study area fishery consists primarily of resources present in Black Canyon Reservoir. The RMP study area also includes re-

sources in the Payette River immediately upstream and downstream of the reservoir and in the lower reach of Squaw Creek, a tributary entering Black Canyon Reservoir from the north.

**2.1.7.1 Black Canyon Reservoir**

Black Canyon Reservoir is a transition zone from a cold water fishery upstream to a warm water fishery downstream. IDFG (2001) reported that Black Canyon Reservoir supports a “warm water” type fishery, but provides only marginal fish habitat because sand from upstream land disturbances has covered most habitat. IDFG manages the reservoir according to their general management program. This program is applied to water bodies (lakes, reservoirs, rivers, and streams) that are not suited for “wild trout” or “put-and-take trout” management, and has no special regulations. IDFG’s management direction for Black Canyon Reservoir from 2001 through 2006 is to monitor fish population species composition and size structure (IDFG 2001).

Game fish species present in Black Canyon Reservoir include largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macro-*

**Table 2.1-7. Species of bats considered sensitive by the BLM that likely occur in the RMP study area.**

Common Name	Scientific Name	State Rank	Sensitive Species
Long-eared myotis	( <i>Myotis evotis</i> )	S3	BLM
Yuma myotis	( <i>Myotis yumanensis</i> )	S3	BLM
Small-footed myotis	( <i>Myotis ciliolabrum</i> )	S2	BLM
Western pipistrelle	( <i>Pipistrellus hesperus</i> )	S1	BLM
Townsend’s big-eared bat	( <i>Corynorhinus townsendii</i> )	S2	BLM, USFS
Fringed Myotis	( <i>Myotis thysanodes</i> )	S3	BLM

S = State rank indicator; denotes rank based on status within Idaho.

1 = Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences)

2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences)

3 = Rare or uncommon but not imperiled (typically 21 to 100 occurrences)

Source: Idaho Conservation Data Center, <http://www2.state.id.us/fishgame/info/cdc/cdc.htm>

*chirus*), channel catfish (*Ictalurus punctatus*), and bullhead (*Ameiurus* spp.) (IDFG 2001). None of these species are native to Idaho. Research by Zaroban et al. (1999) on the attributes of 132 freshwater fish species occurring in the Pacific Northwest indicates that the game species present in Black Canyon Reservoir have a warm water temperature preference and are water pollution “tolerant.” Zaroban et al. (1999) defined pollution “tolerant” species as “fishes that tend to increase in abundance with human disturbances, particularly in relation to increased siltation, turbidity, and water temperature, and lowered concentrations of dissolved oxygen.”

The fishery in Black Canyon Reservoir today generally appears similar to that described by IDFG (1986) approximately 15 years ago. In their fisheries management plan for the years 1986 to 1990, IDFG (1986) stated that Black Canyon Reservoir supports a warm water fishery of bass, crappie, and channel catfish. IDFG (1986) also noted that the reservoir provided only marginal habitat for warm water game species, the same as in the most recent assessment (IDFG 2001).

Sediment deposition in Black Canyon Reservoir since the completion of Black Canyon Dam in 1924 has probably had long-term limiting effects on fisheries habitat. Today, sediment fills approximately 35 percent of the reservoir, having reduced reservoir total active storage capacity from approximately 44,800 acre-feet originally to 29,300 acre-feet at present (Reclamation 2003). Most sediment deposition occurs at the upper end of the reservoir, has effectively filled the original river bed in the area, impedes the normal flow of water into the reservoir, and has resulted in a significant extension of the 100-year floodplain at the confluence of the Payette River and Black Canyon Reservoir (Reclamation 1984). IDFG (2001, 1986) continues to report that Black Canyon Reservoir provides only marginal habitat for warm water game species because of sediment deposition.

### 2.1.7.2 Montour WMA and Adjacent Payette River

The Montour WMA Guide (IDFG and Reclamation undated) states that long-range plans include developing a warm water fishery for bluegill and largemouth bass in ponds within the WMA. Smallmouth bass are also present in several man-made ponds on the western side of the Montour WMA. The Guide also states that rainbow trout and mountain whitefish can be caught in the Payette River adjacent to Montour.

Results of electrofishing by IDFG during 1975 in Black Canyon Reservoir and the Payette River in the Montour Valley indicated that non-game species are more abundant than game species in these two water bodies (Reid 1975, in Reclamation 1984). A total of eight game species and nine non-game species were collected in the area sampled. Non-game fish comprised approximately 93 percent of the catch (462 fish) during spring, 80 percent of the catch (389 fish) during summer, and 61 percent of the catch (89 fish) during fall. Suckers (*Catostomus* spp.) made up 75 percent or more of the non-game fish collected each season, while carp (*Cyprinus carpio*) comprised no more than 6 percent of the non-game fish collected each season. The most abundant game species collected were brown bullhead (*Ameiurus nebulosus*) during spring, smallmouth bass and bluegill during summer, and black crappie and pumpkinseed (*Lepomis gibbosus*) during fall (Reid 1975, in Reclamation 1984). Game species collected during 1975 are generally similar to game species present today, except for smallmouth bass which are listed in IDFG’s current fisheries management plan for the Payette River downstream but not upstream of Black Canyon Dam (IDFG 2001).

### 2.1.7.3 Squaw Creek

This tributary enters Black Canyon Reservoir from the north and contains rainbow trout and,

in its upper reaches, bull trout. IDFG (2001) manages Squaw Creek to maintain native resident stocks of wild rainbow trout (redband trout) and to conserve bull trout. IDFG's management directives for Squaw Creek include inventorying the status and distribution of redband trout, and monitoring the bull trout population present in the upper Squaw Creek drainage (IDFG 2001). Section 2.1.8, *Threatened and Endangered Species*, provides additional information on bull trout in Squaw Creek.

### 2.1.8 Threatened, Endangered, and Sensitive (TES) Species

There are several TES species of flora and fauna potentially occurring within the RMP study area. For this review, TES species are defined as those species with a Federal designation of threatened or endangered, as well as those species that the Idaho Conservation Data Center (CDC) lists as plant species of concern for Gem County. Species presence data from State and Federal sources, such as the FWS, Reclamation, and IDFG, have been reviewed. In total, four TES species (1 plant, 1 fish, 1 bird, and 1 mammal species) are known to potentially occur within the RMP study area. Federal protection is afforded to those species listed or proposed as Threatened or Endangered by the FWS under the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884). ESA-related correspondence is included in Appendix A.

#### 2.1.8.1 Plants

The Ute ladies'-tresses orchid (*Spiranthes diluvialis*) is the only Federally protected plant species that may occur in or near the Black Canyon Reservoir and Montour area. It typically occupies floodplains and wet meadows with little overhanging shrub or tree canopy. Wetland and riparian habitats such as springs, wet meadows, and point bars within river meanders are potential habitat. Ute ladies'-tresses orchids have been found in southeast Idaho

and eastern Washington and may occur in suitable habitats between these locations. The most suitable potential tress habitat would occur in riparian communities along the unpounded reach of the Payette River and possibly on the floodplain at Montour. Some of the wetlands within the Montour WMA would probably not be considered as potential habitat because these areas only developed after groundwater levels rose following construction of Black Canyon Dam. Wetlands that were present before construction of the reservoir and the subsequent rise in groundwater levels might provide suitable habitat for tresses. No searches for this species have been conducted on Reclamation lands.

#### 2.1.8.2 Wildlife

##### Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is listed as threatened in Idaho. Populations have expanded dramatically in Idaho and in most of the rest of the lower 48 states in the last 10 years after the use of the pesticide DDT was banned in the United States. Reclamation (1998) and the Idaho CDC indicate that an historic bald eagle nest site located in the Montour WMA has not been used for several years at least. Winter counts along the Payette River from Emmett to Payette have ranged from four to ten in recent years. Reclamation staff report observing as many as 7 bald eagles in the large trees at Black Canyon Park on some winter days. Undoubtedly, some birds also use the Payette River above Black Canyon Reservoir during the winter. The reservoir probably receives only limited winter use because of the poor fishery, general lack of good perch trees except at a few locations, and icing conditions as winter progresses. Eagles that do winter along the river would feed on fish, occasionally waterfowl, and deer killed along Highway 52.

## **Gray Wolf**

The gray wolf (*Canis lupus*) is classified as an experimental non-essential population throughout most of Idaho, including the Black Canyon and Montour area (59 *Federal Register* 60260, November 22, 1994). Wolves typically occupy higher elevation areas during the summer and follow big game animals to lower elevation winter ranges during the winter. Mule deer winter on the southern portion of Squaw Butte and most stay north of Black Canyon Reservoir. A small number of migrants from big game units 32 and 32A move across the Black Canyon Reservoir toward lands to the south each winter. Wolves could be attracted to the RMP study area during severe winters if deer become especially concentrated.

### 2.1.8.3 Fish

#### **Bull Trout**

Columbia River Basin bull trout (*Salvelinus confluentus*) were listed by the FWS as threatened in 1998 (64 *Federal Register* 111, June 10, 1998). In 1999, FWS determined threatened status for all populations of bull trout within the coterminous (lower 48) U.S. (64 *Federal Register* 210, November 1, 1999). The FWS proposed the designation of critical habitat and announced the availability of a draft recovery plan for Columbia River Basin bull trout in 2002 (67 *Federal Register* 230, November 29, 2002; FWS 2002a). Proposed critical habitat in the vicinity of the study area includes portions of the Squaw Creek watershed from the confluence of Squaw Creek with the Payette River (Black Canyon Reservoir) upstream. Squaw Creek enters Black Canyon Reservoir from the north.

Black Canyon Reservoir and the Montour WMA are located within the proposed boundary of the Payette River Recovery Subunit for bull trout. However, they have not been proposed as critical habitat or identified as bull

trout core areas. The bull trout critical habitat subunit (CHSU, the core unit) within the Payette River Recovery Subunit that is nearest the RMP study area is the Squaw Creek watershed (FWS 2002a). Within the Squaw Creek CHSU, proposed critical habitat includes 120 miles of streams (28 percent of the total) that provide foraging, migratory, and overwintering habitat and allow for genetic exchange among bull trout local populations. Black Canyon Reservoir, the Payette River downstream of Black Canyon Reservoir, and the Payette River between Black Canyon Reservoir and the confluence of the North and South Forks of the Payette have not been proposed as bull trout critical habitat or identified as bull trout core areas (FWS 2002a).

Ideal habitat for bull trout includes clean, cold waters with large woody debris, undercut banks, boulders, and deep pools (Quigley and Arbelbide 1997). FWS (2002b) stated that bull trout require stable stream channels, clean spawning gravels, complex and diverse cover, and unblocked migration routes, and are seldom found in waters warmer than approximately 59 to 64°F. Threats to bull trout include land management practices such as logging, grazing, and road construction, where such practices have degraded habitat through increased sedimentation of spawning gravels, high stream temperatures, and poor water quality (FWS 2002b). Additional threats to bull trout include dams and other barriers (such as impassable culverts) that block adult migrations and access to spawning habitat, and introduced non-native fishes (such as brook trout) that can hybridize with, compete with, and prey on bull trout (FWS 2002b).

The FWS (1998) stated that recent limited surveys indicate bull trout are uncommon in Black Canyon Reservoir. This is not unexpected given the cold, clean, and generally complex habitat requirements of this species as opposed to the warm water, sedimentation, and marginal fish habitat associated with Black Canyon Reservoir (see discussion in

Section 2.1.7, *Aquatic Biology*). The FWS (2002a) noted that “although no major dams prevent bull trout inhabiting the upper portions of the Squaw Creek watershed from entering Black Canyon reservoir, irrigation diversions form barriers to immigrating adults and divert emigrating juveniles into areas with lethal conditions.” A map prepared by the IDFG and presented in Reclamation’s 1998 Biological Assessment addressing operation and maintenance of their facilities in the Snake River Basin (Reclamation 1998) indicates that bull trout are not present in either the Payette River below the confluence of the North and South Forks (including the Black Canyon and Montour reaches) or in lower Squaw Creek near the reservoir. In conclusion, it would appear that bull trout may occasionally occur in the RMP area but are not resident there because of the marginal habitat quality.

## 2.2 Visual Resources

Black Canyon Reservoir and Montour WMA lie west of the Rocky Mountains among the foothills of rural Gem County located in southwest Idaho. The landscape surrounding the reservoir is characterized by rolling hills covered with sagebrush and basalt outcroppings (see Photo 2-14). In contrast to these dry, brown hills is the reservoir itself and the seemingly lush riparian vegetation that grows along portions of the reservoir’s shoreline. Located in a valley upstream from the reservoir, the Montour WMA is characterized by relatively flat agricultural fields (both fallow and actively farmed or grazed) and several wetlands containing dense riparian vegetation (see Photo 2-15). In both locations, the presence of water is what sets this area apart from the dry surroundings.



Photo 2-14. View of the reservoir, Black Canyon Park, and the surrounding landscape.

In general, the visual appearance at the reservoir is quite different compared to that at the Montour WMA. The most prominent visual feature at Black Canyon Reservoir is the reservoir itself in contrast to the immediately adjacent hills that surround it. Human presence is evident within the surrounding landscape as land uses are primarily rangeland, agricultural, and limited rural residential. At the reservoir, human presence is particularly evident at the four recreation areas and several boat launches along the reservoir. Human presence is also significant on the reservoir itself as people participate in water-based recreational activities, particularly during the summer. In addition, roads and some rural industry (Highway 52 being a logging truck route) characterize human presence at and near the park. However, there is generally a low level of human presence overall and it does not generally detract from the rustic level of scenic resources available at the reservoir.



Photo 2-15. View of Montour WMA and the surrounding landscape.

The most prominent visual features at Montour WMA are the Payette River, adjacent wetlands, and more distant surrounding hills. The visual environment in Montour WMA is composed primarily of natural-appearing rural landscapes and riparian woodland. Once a flourishing farming community (early 1900s), the town of Montour no longer remains, although a few structures and gravel roads still exist. These lands have been heavily influenced by agricultural and grazing practices for the last 100 years. Human presence is thus evident within the landscape, as some of the area is still used for agricultural purposes. Cultivated crops in the area include alfalfa, barley, corn, oats, and wheat; grazing also occurs on Reclamation lands, administered by a lease program. The mix of agricultural lands and wetlands also provides excellent habitat for gamebirds and other wildlife that attract hunters, hikers, and campers. As is the case with Black Canyon Reservoir, roads, recreation facilities, limited residential development, and rural industry associated with forestry characterize human presence at and near the park. However, there is a low level of human presence overall and it does not generally detract from the rustic level of scenic resources available at Montour WMA.

The highest quality views of the reservoir exist from spring to early summer when the surrounding hills are green with newly emerging growth and the level of activity at recreation areas and on the reservoir is still minimal. Reservoir drawdown, an annual occurrence at many reservoirs in the region that often results in unsightly exposed banks and mudflats, does not occur at Black Canyon Reservoir. The reservoir has minimal fluctuations in level in order to keep the Black Canyon Canal, which the dam diverts water to, full of irrigation water for the Payette Division of the Boise Project.

The most common views of the reservoir are from Black Canyon and Triangle Parks (see Photo 2-16). Cobblestone Park and particu-

larly Wild Rose Park provide views of the face of Black Canyon dam and dam facility structures as these parks are located downstream of the dam and reservoir. Highway 52, on the north side of the reservoir, provides views of the reservoir between the dam and approximately Squaw Creek, where the highway turns north away from the reservoir. Due to the lack of large vegetation, views from the highway are often unobstructed. Additionally, there are several unofficial pull-off locations along the shoulder of Highway 52 as well as three designated boat launch pull-off areas that provide locations to view the reservoir from other than the highway. There are no public roads or recreation areas on the south side of the reservoir that provide views of the reservoir or existing recreation areas on the north side of the reservoir.



Photo 2-16. View of the reservoir and beyond from Triangle Park.

Sweeping panoramic views, such as those available at the reservoir, are limited at the Montour WMA because of its location in a flat valley. Views from Montour WMA are limited to the more distant hills surrounding the recreation area. Views within Montour WMA are often limited by dense riparian vegetation. The most easily accessible view of the Payette River is from the bridge that crosses it along the Old Montour Road. There are additional views of the river and adjacent wetlands from informal trails, created by hik-

ers, hunters, and anglers, that exist adjacent to them.

Wild Rose, Black Canyon, and Triangle parks can be seen from Highway 52 although vegetation at these sights and topographic differences between them and the road often obscure the view. Cobblestone Park and Montour WMA are not located along Highway 52. Highway 52 is not classified as a scenic byway by the State of Idaho; however, it joins with Highway 55, a scenic byway between Boise and McCall, just east of the Montour 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 character of Black Canyon Reservoir and the surrounding area is characterized by low ambient noise levels. Noise sources present are primarily from motorized recreational activities on the reservoir, visitors at the various recreation areas, and vehicular noise on State Highway 52. The noise levels associated with these sources are likely to vary significantly depending on location, season, and time of day.

There are very few sensitive noise receptors, such as private residences, directly adjacent to the park boundary or in proximity to the park. Of the noise sources within the RMP study area, motorized recreational activities on the reservoir during the summer months are likely the most prevalent. Noise from personal watercraft (PWC) and motorized boats is reflected off the water and, depending on wind and weather conditions, can be heard at locations far from their source. In the upper reaches of the reservoir, nearby landowners/residents have expressed concern about the noise of increasing PWC use during peak season. However, because sedimentation of the upper reservoir has caused it to become shallow and difficult to navigate safely, boat and

PWC use is usually more concentrated on the west end of the reservoir. Also, there is no documented record of these complaints, and no known noise studies for the area have been identified. Other than PWC use, none of the other noise sources within the RMP study area are known to be significantly disruptive to visitors or wildlife. While weekends and holidays during summer months are expectedly noisier than other times, they generally remain within a reasonable level and during reasonable daytime hours.

## 2.4 Cultural Resources

Evidence of human occupation in southwestern Idaho dates to as early as 10,000 years before the present (B.P.). Artifact comparisons with other areas in the region suggest a sequence of prehistoric use of the Montour Valley area from at least 6,000 B.P. to approximately 700 years ago. Over time, there was a gradual shift from the hunting of large fauna toward increased utilization of a diversity of plant and animal resources, reflected in greater variability of tool technologies and site types (Gibson and Kaberline 2002).

The RMP study area is located near the boundaries of the Great Basin and Columbia Plateau culture areas. The ethnographic record suggests that two groups, the Northern Paiute and the Northern Shoshone, both speakers of the Numic language, shared resources and range in the vicinity of the RMP study area along the Payette River. These groups also shared similar material cultures, socio-political organization, and religious practices. Both the Northern Paiute and the Northern Shoshone followed subsistence-settlement patterns based on small bands of hunters and gatherers living in small transitory camps and exploiting a broad array of resources. Larger groups who wintered in valleys would disperse during the summer to exploit a multitude of resources (Morgan 1999).

In addition to being blessed with a moderate climate and an abundance of large and small game animals, the Montour Valley would have appealed to prehistoric groups in other ways. One attraction would have been easy access to fresh water mussels and salmon. Prior to Euro-American settlement, Montour served as an important Indian fishery, with the Montour Valley participating in a major regional Indian trading fair/cultural exchange each summer during salmon season. Another attractive feature of the valley would have been proximity to Timber Buttes. Timber Buttes, a known obsidian quarry approximately 10 miles north of the Montour Valley, served as an important lithic source for stone tool manufacture for prehistoric inhabitants of the region for thousands of years (Morgan 1999).

Historically, Euro-American fur trapping and trading were well in place in the Payette River Valley (including the Montour Valley) by the second decade of the 1800s. By the 1830s, fur resources in the region were depleted and considered “trapped out.” Gold was discovered in the Boise Basin in 1862, with the Payette River serving as a main travel route to the goldfields, taking goldseekers south of Regan Butte, directly west of Montour. In the early 1860s a stage stop was established in the western end of Montour Valley, with four stagecoaches a week traveling up the Payette River through Montour. This stage station became a post office in 1870 and eventually took on stock raising and other functions, becoming known as the Mitchell, Marsh, and Ireton ranch. Prior to 1900, about 50 people lived in and around the valley, relying mostly on logging, mining, ranching, and farming as a way of life. Rail service reached Montour in 1910 (Idaho Northern Railroad), extending through Black Canyon from Emmett to Horseshoe Bend and McCall. In 1911, the town of Montour was platted, and the entire town was built between 1912 and 1915. The town effectively ceased to grow after about the mid-1920s, with ensuing years bringing depression and

bankruptcy to the small community (Briggs No Date; Gibson and Kaberline 2002; Morgan 1999).

The rural, small town character of Montour remained virtually unchanged between the late 1920s and the early 1980s. In 1924, Reclamation constructed Black Canyon Dam to divert irrigation water to crops and orchards in the Emmett Valley, and for power generation. Increased streamflow and sediment buildup within the Black Canyon Reservoir resulted in higher annual water table and annual flooding in the Montour Valley. Subsequent loss of crops and property damage resulted in years of litigation by the local population. In the 1970s, Reclamation acquired the land within the 100-year floodplain to ensure continued project operations of Black Canyon Dam. Following documentation of the Montour Historical District, the Marsh-Ireton Ranch and other businesses, farms, and buildings were purchased and razed. Many long-time Montour residents moved away from the Valley (Morgan 1999).

A total of 52 cultural resource sites (including isolates) have been documented within the boundaries of the RMP study area. The inventory includes 40 archeological sites, 12 historic structures or features, and one potential historic district, which includes several standing structures and the foundation remains of approximately 30 other structures. Most of these sites have been previously recorded on site records filed at the Idaho State Historic Preservation Office (SHPO) (Gibson and Kaberline 2002; Morgan 1999).

Most of the archeological sites are deposits of prehistoric artifacts or flakes, usually obsidian, basalt, or cryptocrystalline silicate (chert, jasper, or chalcedony) produced in tool manufacture. Sites display a range of features and materials, including hearths, diagnostic side and corner notched projectile points, ground stone objects (grinding stones and pestles), cobble choppers, animal bone, and fire-altered rock. Several sites were recognized as dense depos-

its of mussel shells, reflecting prehistoric exploitation of fresh water mussels. One stratified site (10-GM-61) contains the rare remains of a semisubterranean house pit within its deposits. Prehistoric sites appear to be residential camps, where tools were manufactured, and where exploitation of fresh water mussels and procurement of other food sources was a major focus.

Historic documentation in the RMP study area attests to a wide variety of historic site types. These include resources related to transportation (roads, bridges, the railroad); irrigation (dams, canals, and associated structures); and residential/farming/ranching activities (town-site, refuse scatters, buildings, equipment, foundations).

A survey to identify properties of traditional cultural importance to Indian tribes (and sacred sites) has not been undertaken for the RMP study area because of the sensitivity of disclosing the location of such places. The Montour Valley contains streams, valleys, draws, and other natural features that could have served as traditional resource procurement areas for aboriginal peoples in their search for food, medicine, clothing, and other necessities, and might qualify as “traditional cultural properties.” Also, portions of the Valley may have historically served as ritual or ceremonial places, or as locations associated with traditional beliefs and practices; as such, they could constitute places of traditional cultural importance to the Shoshone-Paiute, Shoshone-Bannock, and possibly other tribes, and thus might qualify as “traditional cultural properties.”

Although the RMP study area has been explored for cultural resources since the mid-1970s, a good portion of the RMP study area has not been intensively surveyed on the ground. Of the cultural resource sites known for the RMP study area, the following are considered eligible for the National Register of Historic Places (although more than half of the

known archeological sites have not been evaluated for eligibility to the National Register):

- 10-GM-61 (stratified prehistoric camp site with pithouse)
- 45-1989 (Montour Historic District)
- 45-18109 (Black Canyon Dam)
- 45-1416 (Marsh-Ireton Ranch)
- BS-1819 (prehistoric lithic scatter)
- BS-1824 (prehistoric lithic scatter)

These sites (as well as other sites that remain to be identified and evaluated for the National Register) have the potential to address research questions or to offer vital information relating to prehistoric and historic use of the RMP study area. For example, questions of chronology, prehistoric settlement patterns, natural resource use, and prehistoric affiliations/trade could be answered by future archeological investigations in the Montour Valley. Because it has a combination of floodplain and bench sites, some of which have great antiquity, the Montour Valley is potentially an extremely important context for study of variability and change in prehistoric settlement and subsistence patterns.

## 2.5 Sacred Sites

Sacred sites are defined in Executive Order (EO) 13007 as “any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian Tribe, or an 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...” Under Executive Order 13007, Federal land managing agencies must accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners, and avoid adversely affecting the physical integrity of such sacred sites.

There are various natural features and locations on the RMP study area landscape that would have held spiritual or religious significance to aboriginal tribes. These features and locations might require special attention by Reclamation in future administration of the area. The properties might include altars, vision quest sites, burial sites, and river and rock geographic features, among others. Regan Butte, a prominent geographic feature overlooking the Montour Valley, has a unique characteristic: a large hole in the vertical basalt columns near the peak affords a view through the rock from great distances. This anomaly is especially striking when the sun angle is low and appears to pierce the basalt columns. This feature may have been the location of many sacred or ceremonial activities. Modern lore, in fact, points to the butte as an ancient burial location. Local residents recall collecting trade beads and other artifacts many years ago from the top of Regan Butte. Recent offerings of porcupine quills and other objects attest to the continuing spiritual nature and use of this prominent feature (Morgan 1999).

## 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 things that may be trust assets are 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 Indian Reservation in southeastern Idaho have trust assets both on-reservation 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 Tribe "...shall have the right to hunt on the unoccupied lands of the United States...."

The Tribes believe that 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 determined that the Shoshone word for "hunt" also included to "fish." Under *Tinno*, the Court affirmed that the Tribal Members' right to take fish off-reservation pursuant to the Fort Bridger Treaty (Shoshone-Bannock Tribes 1994).

The Nez Perce Tribe is a Federally recognized Tribe of the Nez Perce Reservation in northern Idaho. The United States and the Tribes entered into three treaties (Treaty of 1855, Treaty of 1863, and Treaty of 1868) and one agreement (Agreement of 1893). The rights of the Nez Perce Tribe include the right to hunt, gather, and graze livestock on open and unclaimed lands, and the right to fish in all usual and accustomed places (Nez Perce Tribe 1995).

The Northwestern Band of the Shoshone Indians, a Federally recognized Tribe without a reservation, possess treaty-protected hunting and fishing rights that may be exercised on unoccupied lands within the area acquired by the United States pursuant to the 1868 Treaty of Fort Bridger. No opinion is expressed as to which areas maybe regarded as "unoccupied lands."

Other Federally recognized Tribes that do not have off-reservation ITAs may have cultural

and religious interests in the areas being considered in the RMP. These interests may be protected under historic preservation laws and the Native American Graves Protection and Repatriation Act (NAGPRA). See Sections 2.4 and 2.5 (*Cultural Resources* and *Sacred Sites*) for a discussion of other Tribal interests.

## 2.7 Socioeconomics

Current population trends, employment, and income for Gem County and nearby Ada, Canyon, and Payette counties are discussed below. Ada County, which contains the city of Boise and neighboring suburban communities, has a large population and thus a significant impact on use of Black Canyon Reservoir, particularly for recreation purposes.

### 2.7.1 Demographic Profile

The closest city to Black Canyon Reservoir is Emmett (population 5,490), the county seat of Gem County (U.S. Census Bureau 2000). Nearly one third of Gem County’s population resides in Emmett, making it the county’s largest city. During the 1990s, Gem County’s population grew 28.2 percent, reaching 15,181 in 2000. In 2000, 63.8 percent of the Gem County population was classified as rural, a slight increase since 1980.

Idaho’s population growth rate from 1990 to 2000 was an increase of 28.5 percent, while the United States’ total population growth rate was 13.1 percent. Most of the population in southwest Idaho is located south of Gem County along the Interstate 84 (I-84) corridor in cities such as Boise, Nampa, and the surrounding suburbs. Ada and Canyon counties have several large cities such as Boise (population 185,787), Nampa (population 51,867), Meridian (population 34,919), and Caldwell (population 25,967). The population of nearby Ada County grew 46.2 percent, reaching 300,904 in 2000.

Table 2.7-1 shows the age distribution of residents in Gem County, surrounding counties, and the State of Idaho for 2000. For the most part, the population distribution and categorical shifts in Gem County resemble those of the state and the country. However, the population of the county and state is growing at a quicker pace than that of the United States overall, and there is a greater percentage of people over 65 years old in Gem County than elsewhere.

According to the U.S. Census Bureau, the population of the State of Idaho between 1990 and 2000 grew from 1,006,749 to 1,293,953, an increase of 287,204 people (28.5 percent). Between 2001 and 2002, the population of Idaho was estimated to have grown 1.6 per-

**Table 2.7-1. Gem County and State of Idaho age distribution.**

County	2000 Population	Change Since 1990 (%)	People Under 5 Years of Age (%)	People Under 18 Years of Age (%)	People Over 65 Years of Age (%)
Gem	15,181	28.2	7.0	28.0	15.6
Ada	300,904	46.2	7.7	27.3	9.1
Canyon	131,441	45.9	9.1	30.9	11.0
Payette	20,578	25.2	7.6	30.6	13.2
Idaho	1,293,953	28.5	7.5	28.5	11.3
United States	281,400,000	13.1	6.8	25.7	12.4

Source: U.S. Census 2000

cent compared to a 1.1 percent national average, making Idaho the ninth fastest-growing state in the country during that period. Projected population growth at the state level is done by the U.S. Census Bureau. The population growth projection for Idaho from 2000 through 2025 is listed in the Table 2.7-2.

Until 1992, the U.S. Department of Commerce, Bureau of Economic Analysis, made estimates of future population at the county level for each state. Each state is now responsible for determining their projections, and there is great diversity in methods and results from state to state. Several states, including Idaho, do not have population projections available on the web, although the USFS has developed tables for the web and public use. Table 2.7-3 provides county population projections based on USFS analysis of population data.

These projections indicate significant population growth in the state. Other entities, such as The Federation for American Immigration Re-

form (FAIR), have projected a state population as high as 2,422,000 in 2025, an increase of 87 percent above the state's population in 2000.

The county population growth projection data indicate that there will be significant growth in Ada County, likely associated with the growth of the Boise metropolitan area. More rural counties, such as Canyon and Gem, will also experience population growth according to the projections, although less than neighboring Ada County. In the case of Gem County, growth is projected to be less than that of the state as a whole, although still 27 percent.

**2.7.2 Economic Setting**

Emmett is located in the “Valley of Plenty,” made possible by the development of an irrigation canal system that has diverted water from the Payette River and Black Canyon Reservoir since the late 1800s when the valley

**Table 2.7-2. U.S. Census Bureau state population projection.**

State	2000 Population	2025 Population	Population Change (2000-2025)	Percent Change (2000-2025)
Idaho	1,293,953	1,739,000	445,047	34%

Source: U.S. Census Bureau

**Table 2.7-3. County and state population projections.**

County/State	2000 Population	2015 Population	Population Change (2000-2015)	Percent Change (2000-2015)
Ada	292,609	405,968	113,359	39%
Canyon	128,580	173,547	44,967	35%
Gem	15,326	17,824	2,498	16%
Idaho	1,273,855	1,609,314	335,459	26%

Source: USFS website (<http://www.fs.fed.us/r1/planning/econ/easy/info-un/pop-growth.html>) with data provided from the Idaho Department of Commerce.

began to be settled. In the early 1900s, the irrigation canal system continued to be expanded; by the 1920s, the valley was producing an abundance of orchard fruit, specifically cherries and apples. After an economic decline brought on by the Great Depression and years of exceptional drought in the 1930s and 1940s, the economy rebounded in the 1950s. Since then, the economy has been based on agriculture, timber, and mining, each benefiting from technological advances and providing for a growing post-World War II population.

More recently, however, the area's economy has begun to diversify by shifting from resource-based manufacturing to government, services, and wholesale and retail trade. Gem County experienced a gain in population since 1990 but did not receive an equal gain in economic benefit during this time. This is due to an increasing number of Gem County residents who choose to commute out of the county to work and shop (primarily in Ada County, where Boise and its suburbs are located). Both the number of persons in the workforce and opportunities for employment increased from 1990 to 2000. The Civilian Labor Force of Gem County increased 19 percent during that period, while Nonfarm Payroll Jobs in the county increased 29.7 percent. Between 1990 and 2000, the largest increases in the number of jobs in Gem County were in services and wholesale and retail trade. The largest growth rate (200.8 percent) in the county was in mining and construction during this same period (Idaho Department of Labor 2002).

Agriculture and timber resource products are the two basic local industries, and the timber industry formerly provided the bulk of family-wage jobs. However, the timber industry declined because of a lack of a steady supply of logs. As a result, the county's largest employer, Boise Cascade, closed its Emmett mill. The mill later burned in an accidental fire. The amount of land devoted to fruit cultivation has

decreased in the Emmett Valley because acreage formerly used for crops is now being utilized for housing and commercial development (Idaho Department of Labor 2002). Between 1987 and 1997, the number of farms actually increased from 539 to 552, but the average acreage of those farms decreased from 414 to 331 acres (Idaho Department of Commerce 2000).

In 2000, the median age of persons in Gem County was 37.5 years, up from 36.0 years in 1990 and 31.4 years in 1980. There were 5,539 households in Gem County with an average of 2.7 persons per household in 2000. The 1997 median household income of Gem County was \$30,132, which was below the statewide median household income of \$33,612. The percentage of county residents below the poverty level (15.4 percent) was higher than the percent of state residents (13.0 percent) below the poverty level (U.S. Census 2000). In 1990, 70 percent of Gem County residents over 25 years of age were high school graduates, and 9 percent had at least a bachelor's degree. By comparison, 80 percent of all Idaho residents over 25 years of age were high school graduates, and 18 percent had at least a bachelor's degree. In 1990, 95 percent of Gem County's population was white and 5 percent was Hispanic (Gem County 1995).

In contrast to Gem County, there were 113,408 households in nearby Ada County with an average of 2.6 persons per household. The 1997 median household income of Ada County was \$43,321, significantly higher than the statewide median household income of \$33,612. The percentage of county residents below the poverty level (8.9 percent) was significantly lower than the percent of state residents (13.0 percent) below the poverty level (U.S. Census 2000).

