

Chapter 3 Affected Environment

This chapter describes the biological, cultural, and socioeconomic resources most likely affected by expanding the acquisition boundary of Arapaho NWR.

Geographic/Ecosystem Setting

The Chandler Ranch is located in an intermountain of Jackson County within a glacial basin in north-central Colorado (Figure 1). The ranch is situated along the western edge of the Central Waterfowl Flyway. Jackson County opens north into Wyoming and is rimmed on the west by the Park Range, on the south by the Rabbit Ears Range, and on the east by the Medicine Bow Range. The basin floor is locally known as North Park and encompasses approximately 600 square miles. The basin floor is relatively flat with an elevation range of 7,900 to 8,300 feet. Slow, meandering streams, which crisscross the basin, flow toward the north-central part of the basin to form the North Platte River. Most of the floodplain is irrigated meadow, while the adjacent low rises are characterized by sagebrush grasslands.

Sagebrush uplands are the dominant vegetative community encompassing 80 percent of the Park. Sagebrush uplands are dominated by seven primary species of sagebrush, with a perennial bunch-grass and forb understory. Meadows are typically irrigated to produce a single hay crop per year. Meadow grasses typical include timothy, red top, garrison creeping foxtail, and foxtail barley. Riparian areas are dominated by willows and other low growing shrub species.

Climate

The climate is semiarid which can be characterized as having short-cool summers, followed by long, cold winters. The mean rainfall in Walden is 10.83 inches of precipitation annually. Temperatures and precipitation vary greatly with elevation and location. Mean annual air temperature in Walden, near the center of the Park, is 36.4 degrees Fahrenheit. Temperature extremes are minus 39 degrees to 90 degrees Fahrenheit, based on the National Weather Bureau 30-year average. The average length of the growing season in Walden is 43 days. The average date for the last killing frost in Walden is July 1, and the average first killing frost is August 14, based on North Park weather station's 70-year average. The relatively short frost-free season inhibits any form of agriculture today except grass hay near floodplain areas. Due to this, the primary agricultural use in the area is grazing lands and hay production.

Generally, annual precipitation increases as elevation increases from the floor to the outer edge of North Park. Elevation ranges from slightly below 8,000 feet on the valley floor to 12,965 feet on Clarks Peak. Seventy percent of the annual precipitation falls as snow. Walden averages 53 inches of snow per year, the lowest of any point in the Park. The highest average monthly precipitation occurs in March, April, May, and August (Lischka et al., 1983).

Geological Resources

North Park is a structural basin between the Precambrian granites, gneisses and schists of the Medicine Bow and Park Ranges and Independence Mountain. The Surface geology of the Park floor is dominated by the sandstones, conglomerates, and shales of the Tertiary Coalmont

Formation. Coal is found in the lower members of the formation (Hail, 1968). The North Park Formation overlies the Coalmont Formation and consists of white, calcareous conglomerates. The Coalmont Formation is exposed along a long narrow syncline ridge trending northwest from Owl Mountain to the confluence of Roaring Fork and Grizzly Creeks. The syncline includes Owl Ridge and Peterson Ridge. Pierre Shale underlies the Coalmont Formation and is exposed primarily in the northwestern and northeastern quadrants of North Park. Evidence of Tertiary volcanics is obvious along the south boundary of the Park. Quantities of breccia and other volcanics are common in the Rabbit Ears Range in the form of dikes, flows, and ash.

Significant glacial activity occurred in North Park during the Pleistocene. Fluvial gravels, and interfluvial terraces are examples of the influence of glacial activity upon the current landscape of the Park floor. Several natural lakes in the area are thought to be remnants of Pleistocene glaciation. Winds also influenced the geology of the Park. Prevailing southwesterly winds, thought to be caused by the low ridge between Rabbit Ears Peak and Arapaho Pass, have deposited fine grains alluvium, some of which reaches thicknesses of 30 feet. Winds are suggested to have created several shallow lakes within the basin, including Hebron Sloughs, located just southwest of the refuge (Lischka et al. 1983).

Ecosystem Setting

The Chandler Ranch lies within the Platte/Kansas Rivers Ecosystem. This ecosystem team has identified, among other things, protection of sagebrush and wet meadow/riparian habitat (between 8,000-10,000 feet elevation), as a primary focus for the mountain portion of the ecosystem (USFWS 2002). The two largest habitat types within this project area are sagebrush (> 1,840 acres), and irrigated meadows (>660 acres), thus contributing directly to the ecosystem goals and objectives. An additional goal and objective is “protect and/or restore 20 miles of riparian corridor within the next 5 years along both large and small drainages.” A strategy related to accomplishing this goal is through land acquisition, both “fee and easements by FWS and our partners”. This acquisition will protect about 2.5 miles of riparian habitat along Pinkham Creek.

Description of Habitats

The Chandler Ranch is composed of a variety of habitats including dense riparian willows, irrigated meadows, and sagebrush-dominated uplands (see table 1, figure 3). Other habitats include small groves of aspen and conifer trees, and small seasonal wetlands.

Willow Riparian

The willow habitat, located primarily along Pinkham Creek, exceeds 5 meters in height, and 200 meters wide in places. Pinkham Creek, which originates high in the Medicine Bow Mountains within the Roosevelt National Forest to the east, is a perennial stream which ultimately empties into the North Platte River approximately 4 miles west of the project area. Pinkham Creek is one of the last main tributaries of the North Platte River within the State of Colorado.

Habitat/Land Use	Chandler Ranch		BLM Roundouts		Overall	
	Acres	%	Acres	%	Acres	%
Sagebrush	1,344.0	59.8%	496.1	82.0%	1,840.4	64.1%
Irrigated Meadow	663.6	29.5%	-	0.0%	663.6	23.3%
Willow	145.1	6.5%	-	0.0%	145.1	5.5%
Deciduous Trees	42.2	1.9%	4.2	0.7%	46.4	1.7%
Disturbed	33.4	1.5%	2.1	0.4%	35.5	1.0%
Evergreen Trees	16.1	0.7%	85.0	14.1%	101.1	3.7%
Other Wetlands	1.5	0.1%	-	0.0%	1.45	0.1%
Unknown Shrub	-	0.0%	17.6	2.9%	17.6	0.6%
Total	2,246.1	100.0%	605.0	100.0%	2,850	100.0%

Table 1. Habitat types within the project area.

Irrigated Meadows

There are approximately 664 acres of irrigated meadows within the project area. These meadows are irrigated by 4 ditches which divert water from Pinkham Creek via relatively crude water control structures. With water rights dating to the 1880's, these meadows have been in existence for over 100 years. Typically the meadows are cut for hay production in late July or August. Red clover, timothy, Kentucky bluegrass, and other tame grasses and forbs comprise these meadows.

Sagebrush

The majority of the upland habitat surrounding the irrigated meadows and riparian areas is dominated by sagebrush. Wyoming big sagebrush and mountain big sagebrush are the most common species in the project area. Within North Park there is an estimated 285,000 acres of sagebrush-dominated or co-dominated habitat. Sagebrush communities have been identified by the Colorado Division of Wildlife as a high priority habitat in the Colorado State Wildlife Plan (CDOW 2006).

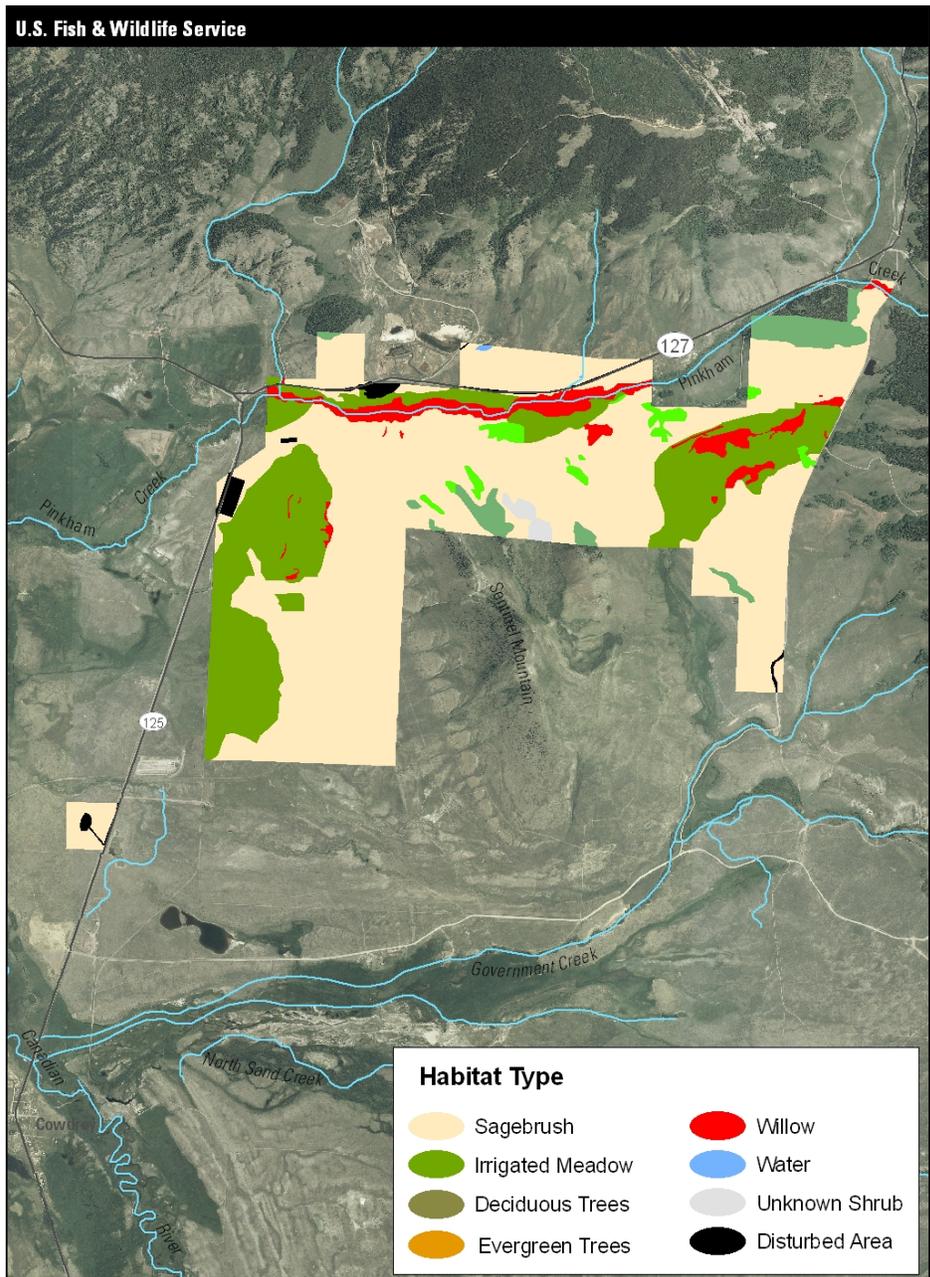


Figure 3. General habitat classes within the project area.

Wildlife Values

The addition of the Chandler Ranch into the refuge system will enhance and ensure protection of habitats valuable to migratory birds that utilize North Park. Riparian willow habitats, in addition providing breeding habitat for numerous species, provide critical stopover areas for neo-tropical birds migrating on to northern breeding areas. Riparian habitats, especially those of high quality as occurs on this ranch, are lacking not only in North Park, but throughout the west. These areas contain the highest diversity of breeding birds among any habitat type, yet compose only a fraction of the available habitat to birds.

Sagebrush provides habitat for a suite of species, some of which are entirely dependent on this habitat. These species, referred to as sagebrush-obligate species include greater sage grouse, sage thrasher, sage sparrow, and Brewer's sparrow. All of these are recognized as Species of Concern by state and federal agencies (CDOW 2006, USFWS 2002). Greater sage grouse, currently under review for Endangered Species Act protection, have been documented to utilize lek sites within two miles of the project area. Because of the proximity to an active lek site, irrigated meadows on the south side of the property have been identified as a greater sage grouse "Brood and Production Area" by the CDOW (figure 4).

Raptors such as the bald eagle, golden eagle, peregrine falcon, Swainson's hawk, short-eared owl, and northern harrier all use habitats that occur within this area, thus are likely residents throughout the year.

Grassland nesting birds such as savanna sparrows, Lincoln's sparrows, and song sparrows are also common nesters in North Park and can be expected to occur within the project area. Sandhill cranes have been documented using irrigated meadows within the area.

North Park phacelia is a federally listed endangered plant known only to occur in Jackson County, Colorado. The majority of known populations occur on a BLM Natural Resource Area located northwest of Walden. It also occurs on the Arapaho NWR in two locations. This plant appears to prefer disturbed eroding sandstone outcrops of the Coalmont Formation on west and southwest facing slopes. These types of habitat does occur within the project area, however, the plant is not known to exist there. Surveys would be conducted in the future.

Canada lynx, a federally-listed threatened species, is known to occur in the forested areas surrounding North Park. This species likely travels through riparian corridors to reach preferred habitats.

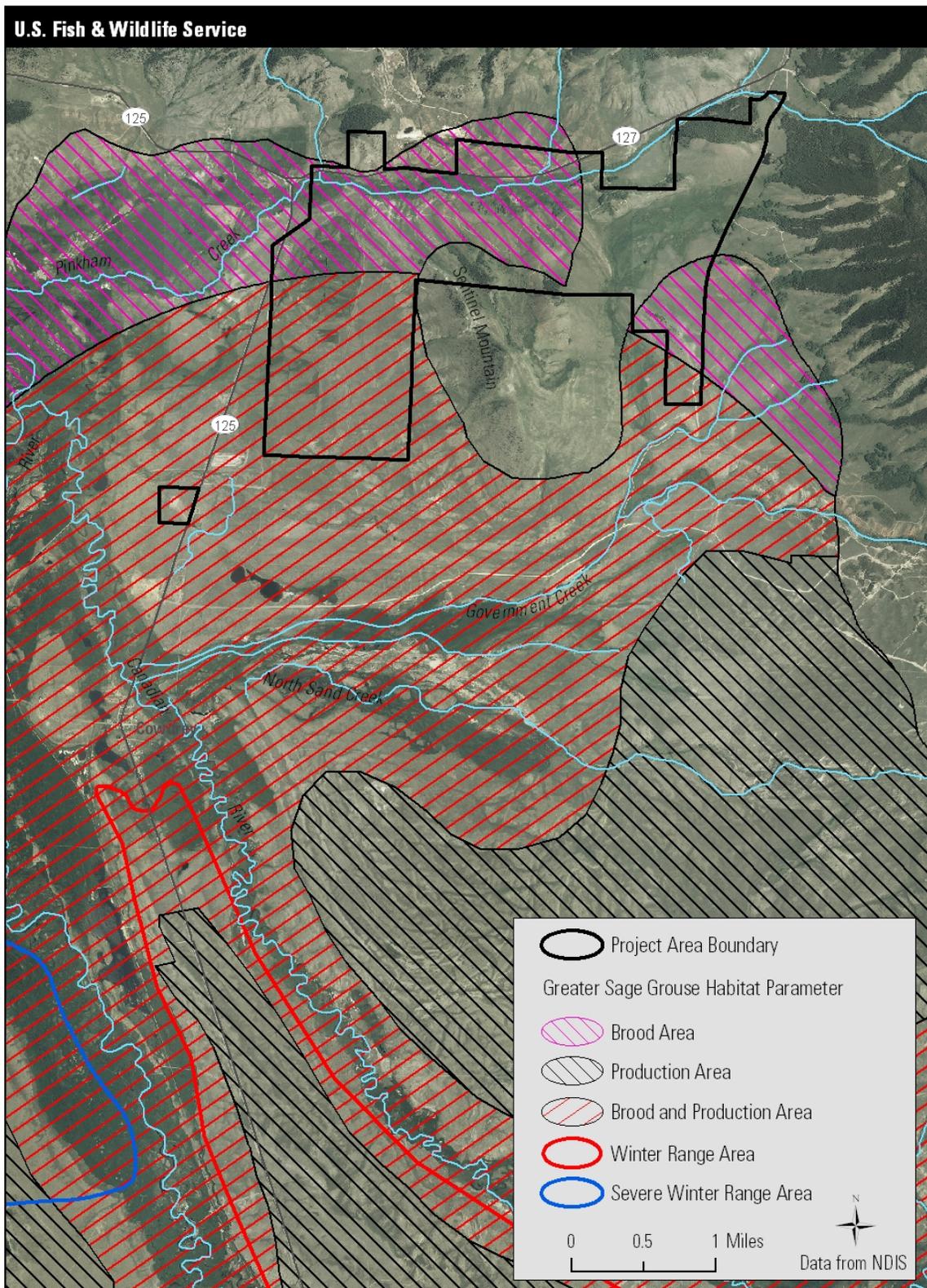


Figure 4. Key habitat parameters for greater sage grouse in vicinity of project area.

Water Rights

The Chandler Ranch was one of the original areas homesteaded in North Park in the mid-1870's. The original homesteader, James O. Pinkham, spent the long winters in Laramie, Wyoming, and the summers panning for gold in North Park. He established a homestead on the property in 1874. Believing North Park held riches of gold, he convinced others to come to North Park and settle. By 1875, nearly 100 men were prospecting for placer gold around the Rabbit Ears, Independence, and Owl Mountains.

As a result of the early presence of Pinkham in this area, water rights associated with the property are very senior within North Park. All of the water rights are associated with Pinkham Creek, a perennial stream which runs through the north side of the property. A summary of water rights associated with the Chandler Ranch is below in table 2.

Table 2.

Name	Flow (cu ft sec)	Priority Date
Walker Ditch	2.00	6/21/1887
Hardwork Ditch	1.17	9/30/1889
Newport Ditch	3.00	9/1/1887
Newport Ditch	4.00	5/31/1894
Newport Ditch	15.50	5/27/1909
Timothy Ditch	1.00	8/31/1892
Allred Ditch	3.91	5/19/1896
	30.58	

The ranch's groundwater rights will also be transferred. The groundwater well is permitted at 33 gallons per minute, 1.0 acre-foot / annual, for domestic use. This permit is located in the northeast ¼ of the southwest ¼ of section 31, township 11 north, range 70 west.

Mineral Rights

The acceptance of the donated ranch will be subject to outstanding mineral reservations. Although no mineral title search was conducted, it appears that at least a portion of the mineral interest has been severed in the past.

Contaminants and Hazardous Wastes

A Level I contaminants survey of the Chandler ranch property was completed. As a portion of the property historically had been leased for purpose of storing mill tailings generated from an adjacent fluorspar mining operation, the potential for hazardous substances or other

environmental problems existed and additional investigation was conducted. One sample that was taken by the Service contaminant biologist adjacent to the road historically used for mining showed a slightly elevated level of arsenic. The elevated level found in the sample most likely resulted from windblown, fugitive dust from the previous operations on the adjacent mine. This sample was later determined to be taken outside of the project boundary. It was determined that no clean-up was necessary, but it was recommended that there be no surface disturbance in the vicinity of the sample. The affected area is much less than one acre, and is separated by a road from the remainder of the Chandler Ranch. The refuge has agreed to use institutional control.

Cultural Resources

The Colorado mountains have been used by humans for thousands of years. Spears points dating to the Paleo-Indian Period have been recovered in North Park. The Paleo-Indian Period extends from 12,000 B.C. to around 5740 B.C. Although numerous other Paleo-Indian sites have been located in Middle Park, including evidence of bison hunting 10,000 years ago, known occurrences of Paleo-Indian occupation in North Park have been limited to small campsites. Some archaeologists think Paleo-Indian groups lived in the Parks year-round; others propose winter camps in the foothills with exploitation of various mountain resources during summer months. The Archaic Period followed the Paleo-Indian Period and lasted until A.D. 150. Hunters used darts and throwing sticks called atlatls. There is also a higher reliance on small game and plant resources. A major drought on the Plains (ca. 5,000 to 2500 B.C.) caused change to settlement and subsistence patterns. People moved into the mountains for longer periods of time and exploited a wider variety of plant and animal resources. Increased moisture during the latter part of the Archaic brought people back onto the Plains, but the mountains continued to be an important part of their subsistence. Activity increased in North Park during the Archaic. The Late Prehistoric Period (A.D. 150 to A.D. 1540) saw the introduction of the bow and arrow and ceramics. Bison hunting again became an important part of the economy, but the people of the Late Prehistoric continued to rely on a variety of available plant and animal resources. Researchers have proposed a seasonal round of activities. People would leave their foothills winter camps and head north into the Laramie Basin, then south through North and Middle Park collecting and hunting until fall. From there, they would turn east hunting bighorn sheep along the Continental Divide on their way back to the foothills.

The Protohistoric Period starts with European contact around A.D. 1540. Of the modern tribes, the Utes are most often associated with the mountains and long-term utilization of the resources of North Park. There are also historic accounts of visits to North Park by the Shoshone, Arapaho, and Cheyenne.

Archaeological sites in North Park are generally small in size and associated with seasonal use of the area. They include open campsites and lithic scatters with stone circles (tipi rings) located along the ridges. Culturally scarred trees and wickiups representing Protohistoric Ute use may be found in the forested area. Rock art and bison kill sites, though uncommon, have been reported in North Park. A detailed cultural resource overview of North Park (Larson and Letts, 2003) is available from the Service Regional Office.

The first European visitors to New Park (now known as North Park) were probably trappers. The first known party of trappers was headed by Alexander Sinclair and Robert Bean in 1825.

Several famous trappers, miners, and hunters made their way through North Park. Kit Carson, Jim Baker, Sublette, Gervais and Vasquez, Calvin Jones, Henry Fraeb, John Gantt, and Pegleg Smith all visited the Park in the 1840s. The second western expedition of John C. Fremont took him through the Park in 1844. Sir George Gore passed through the Park on a hunting expedition in 1855, and found mule deer, elk, beaver, bear, and mountain sheep. By 1917, most of the game species were gone. Cyrus Mendenhall began grazing cattle in North Park in 1879. By 1885 the beef industry was booming, and North Park had its share of large ranches. Overgrazing and severe winters decimated herd sizes in the Park, and by 1889, ranching was no longer as profitable as it had been. In the late 1800s, the economy of the North Park shifted to mining; mining of coal, gravel, fluorspar, copper, silver, and gold, along with logging and ranching, became the main economic developments of the area. Over time, mining has decreased while oil and gas exploration and development has recently increased in the area.

The Service has a trust responsibility to American Indian tribes that includes protection of the tribal sovereignty and preservation of tribal culture and other trust resources. Currently, the Service does not propose any project, activity, or program that would result in changes in the character of, or adversely affect, any historical cultural resource or archaeological site within the project area. If and when such undertakings are considered, the Service will take all necessary steps to comply with section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. The Service pursues compliance with section 110 of the NHPA to survey, inventory, and evaluate cultural resources.

Socioeconomic Environment

Walden, neighboring Arapaho NWR near the North Boundary, is an historic mountain town established in the 1800s with a strong ranching heritage. Its business community provides most of the essential goods and services, however county residents must travel to bigger cities to purchase larger durable goods (e.g. cars and major appliances) and specialty items.

A region (and its economy) was defined as all counties within a 30-60 mile radius of the impact area. Only spending that took place within this local area was included as stimulating the changes in economic activity. The size of the region influenced both the amount of spending captured and the multiplier effects. Based on the relative self-containment in terms of retail trade and distance of Walden, Jackson County was assumed to comprise the economic region for this analysis.

Population:

The 2000 census estimated Jackson County's population at 1,577 people (U.S. Census Bureau). More than 900 of the county's residents reside in Walden, leaving more than a million acres inhabited by less than 700 people (Town of Walden, 2001).

Employment:

Ranching, retail trade, government, timbering, mining, support services and recreation are major employers in Walden. Major exports include livestock, native mountain hay, timber, oil and carbon dioxide (Town of Walden, 2001).

Tourism and construction have started to play larger roles in the county's economy (Town of Walden, 2001). Most of these jobs are found in the retail trades (supplies, souvenirs, restaurants,

and grocery stores) and service (hotel, gas stations, amusement, and recreation activities) sectors in an economy.

