



6 Socioeconomic Analysis

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The U.S. Geological Survey's biological resources division (BRD) prepared a socioeconomic study during the comprehensive conservation plan (CCP) process. The entire study "Regional Economic Effects of Current and Proposed Management Alternatives for Arapaho National Wildlife Refuge" is included in the draft CCP and environmental assessment.

The following summary of the study focuses on the economic effects estimated to result during implementation of this CCP.

Table 9 summarizes the economic analysis for the CCP.

- Under current management, economic activity directly related to all refuge operations would generate an estimated 14.7 jobs and \$458,634 in Jackson County.
- Including direct, indirect, and induced effects, refuge activities would account for 20.7 jobs and \$570,106 in personal income in Jackson County.
- Current refuge management activities account for 1.8 percent of county employment.

Table 9. Summary of the economic analysis for the comprehensive conservation plan, Arapaho National Wildlife Refuge, Colorado

<i>Effects</i>	<i>Total Staffing and Budgeting Impacts</i>	<i>Grazing Activities</i>	<i>Recreational Activities</i>	<i>Aggregate Impacts</i>
Direct Effects				
Annual income	\$736,625	\$24,407 to \$67,780	\$29,918	\$790,950 to \$834,323
Jobs	18.2	1.2 to 3.4	2.1	21.5 to 23.7
Total Effects				
Annual income	\$811,883	\$47,518 to \$131,959	\$39,308	\$898,709 to \$983,150
Jobs	22.4	2.5 to 6.9	2.5	27.4 to 31.8
% of County Employment	2.4 to 2.8			

Table 10 summarizes the estimated economic effects for carrying out this plan.

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Current refuge management activities account for 1.8 percent of county employment.

Further background information used for this analysis is summarized in the following descriptions of the socioeconomic setting and expected economic impacts.

Table 10. Summary of the economic effects associated with the comprehensive conservation plan, Arapaho National Wildlife Refuge, Colorado

<i>Effects</i>	<i>Total Staffing and Budgeting Impacts</i>	<i>Grazing Activities</i>	<i>Aggregate Impacts</i>
Direct Effects			
Income (\$/year)	+\$375,689	\$0 to -\$43,373	+\$332,316 to +\$375,689
Jobs	+9.0	0 to -2.2	+6.8 to +9.0
Total Effects			
Income (\$/year)	+\$413,044	\$0 to -\$84,441	+\$328,603 to +\$413,044
Jobs	+11.1	0 to -4.4	+6.7 to +11.1

Socioeconomic Setting

Walden, neighboring Arapaho National Wildlife Refuge to the north, 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.

For this analysis, a region (and its economy) was defined as all counties within a 30- to 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 persons (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).

While Colorado experienced a 30.6-percent population increase from 1990–2000, Jackson County's population decreased 1.7 percent over the same period. In 2000, the population per square mile in Jackson County averaged one person, while the state's average was 41.5 persons.

The 2000 census reported the make-up of the county population as follows:

- 6.5 percent are persons of Hispanic or Latino origin
- 92.1 percent are persons of white (not Hispanic or Latino) origin
- 0.3 percent are black or African American persons
- 0.8 percent are American Indian and Alaska Native persons
- 0.1 percent are Asian persons

Fifty-seven percent of the county population 25 years and older were high school graduates, and 11 percent were college graduates (U.S. Census Bureau).

Employment

According to the Town of Walden (2001), employment in Jackson County is starting to rebound since the closure of the lumber mill in 1994. Ranching, retail trade, government, timbering, mining, support services, and recreation are major employers. Major exports include livestock, native mountain hay, timber, oil, and carbon dioxide (Town of Walden 2001).

Local and state employment is shown in table 11. In 2000, 60.6 percent of county jobs were in private wage and salary employment (i.e., people who work for someone else) as compared to 85.6 percent for the State of Colorado. Self-employment in Jackson County accounted for the remaining 39 percent of county jobs and grew by 92 percent from 1970 to 1997 (Morton 2000).

Table 11. Employment for Jackson County and Colorado, 2000

Industry	Jackson County		State of Colorado	
	Number of Jobs	Percent of County Total	Number of Jobs	Percent of State Total
Total farm	245	21.6	44,406	1.5
Total non-farm	889	78.4	2,916,514	98.5
Private	687	60.6	2,534,168	85.6
Agricultural services, forestry, and fishing	(D)	—	39,364	1.3
Mining	(D)	—	22,634	0.8
Construction	108	9.5	226,475	7.6
Manufacturing	56	4.9	217,473	7.3
Transportation and utilities	57	5.0	162,241	5.5
Wholesale trade	(D)	—	121,306	4.1
Retail trade	148	13.1	493,168	16.7
Insurance and real estate	(D)	—	304,660	10.3
Services	192	16.9	946,847	32.0
Government	202	17.8	382,346	12.9

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, 2002.
(D) Not shown to avoid disclosure of confidential information, but the estimates for this are included in the total.

According to the Town of Walden (2001), while more than two-thirds of employment is in agriculture, only one-fifth of the county's income is generated by agriculture. Agricultural-related income (includes farming and agricultural services) fell from 35 percent of total, county personal income in 1973 to just 8 percent of total personal income in 1997 (Morton 2000). Table 12 displays personal income for Jackson County and Colorado.

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 trade (supplies, souvenirs, restaurants, and grocery stores) and service (hotels, gas stations, amusement, and recreation activities) sectors in an economy.

In 1999, tourism-related jobs (mostly hunting) provided almost 17 percent of county employment and 12 percent of total income (Seidl and Garner 2001).

According to Colorado Department of Local Affairs (2001), traditional tourism is transitioning to second-home tourism where more affluent visitors and retirees are purchasing seasonal homes in Colorado mountain communities.

In 1999, retirees and tourism combined provided almost 30 percent of county employment and more than 50 percent of total base income (Seidl and Garner 2001).

Table 12. Personal income for Jackson County and Colorado, 2000

Area	Personal Income	Non-farm Personal Income	Farm Personal Income	Per Capita Personal Income
Jackson County	\$32,567,000	\$32,713,000	-\$146,000	\$20,612
State of Colorado	\$140,224,394,000	\$139,579,510,000	\$664,884,000	\$32,434

Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, 2002.

Expected Economic Impacts

Economic impacts are typically measured in terms of number of jobs lost or gained, and the associated result on income. Economic input-output models are commonly used to determine how economic sectors will and will not be affected by demographic, economic, and policy changes.

The economic impacts of the implementing the CCP were estimated using IMPLAN, a regional input-output modeling system developed by the USDA Forest Service (Olson and Lindall 1996).

Refuge Jobs and Income

Refuge administration and activities generate 11.3 jobs and \$398,839 in personal income in Jackson County and account for 1 percent of total employment in the county.

Current staffing at the refuge consists of six permanent and four seasonal employees, accounting for an annual payroll (including salaries and benefits) of \$392,543 in 2002.

In addition to providing salaries and benefits, the refuge purchased goods and services totaling \$105,207 in 2002, approximately 60 percent of which was spent locally in the Jackson County economy.

Additional annual funding needed for the target staff organization (see table 6 in chapter 5) is

anticipated to cost \$430,000. Additional, non-salary expenditures are estimated to cost \$46,000 annually (\$36,000 for habitat projects and \$10,000 for research and studies). It is assumed that approximately 60 percent of non-salary expenditures will still be spent locally in the Jackson County economy (table 13).

Table 13. Annual expenditures for Arapaho National Wildlife Refuge, Colorado

Salary	Non-salary	Total
\$822,543	\$151,207	\$973,750

Because of the way industries interact in an economy, a change in the activity of one industry affects activity levels in several other industries. For example, an increase in funding could have the following effects.

- The refuge could start new projects or hire additional staff members.
 - This added revenue would directly flow to the businesses from which the refuge purchases goods and services and to the new refuge employees.
 - As additional supplies are purchased or as new staff members spend their salaries within the community, local businesses would purchase extra labor and supplies to meet the increase in demand for additional services.

—The income and employment resulting from refuge purchases and refuge employees' spending of salaries locally represents the direct effects of refuge management activities within Jackson County.

- To increase supplies to local businesses, input suppliers must also increase their purchases of inputs from other industries.

—The income and employment resulting from these secondary purchases by input suppliers are the indirect effects of refuge management activities within the county.

—The input supplier's new employees use their incomes to purchase goods and services.

—The resulting increased economic activity from new employee income is the induced effect of visitor spending.

The sums of the direct, indirect, and induced effects describe the total economic effect of refuge management activities in Jackson County (table 14).

Table 14. Combined refuge personnel and non-salary expenditures in Jackson County, Colorado

<i>Effects</i>	<i>Current Management</i>	<i>Target Management</i>
Direct Effects		
Annual income	\$360,936	\$736,625
Jobs	9.2	18.2
Indirect and Induced Effects		
Annual income	\$37,903	\$75,258
Jobs	2.1	4.2
Total Effects		
Annual income	\$398,839	\$811,883
Jobs	11.3	22.4
% of County Employment	1.0	2.0

Grazing Activities

According to the 1997 census of agriculture (U.S. Census Bureau), there were 126 ranches in Jackson County, totaling 477,063 acres (46 percent of the county area). Seventy percent of the operators listed ranching as their principal occupation, while 30 percent listed ranching as a secondary occupation.

Jackson County's cattle and calf inventory numbered 47,683, with 26,549 cattle and calves sold in 1997 (U.S. Census Bureau). Livestock production accounted for \$12.3 million in sales (88 percent of all ranch product sales) in Jackson County in 1997.

Jackson County had 364,255 acres of total pasture land in 1997. Of the 126 ranches in the county in

1997, 69 ranches (55 percent) held public grazing permits with at least one federal agency. The Bureau of Land Management accounted for most of these permits followed by the USDA Forest Service (U.S. Census Bureau).

Pastures on Arapaho National Wildlife Refuge currently lease for cattle grazing to six local permittees, accounting for 2.9–4.7 percent of the total grazing capacity in the county.

The current average grazing level of 8,470 animal unit months (AUMs) converts to an average of 1,738 head per month on the refuge during the typical grazing season (averaging 4.5 months).

The sales associated with the current level of head grazed on the refuge account for an estimated 3.4 jobs and \$67,780 in labor income in the range-fed cattle industry and 6.9 jobs (0.61 percent of county employment) and \$131,959 in labor income throughout the county.

This CCP estimates the same range in grazing number reductions from the 1996–2001 average base levels. It anticipates a range of grazing numbers from 3,050 to 7,650 AUMs annually, representing approximately a 10- to 64-percent reduction from the 1996–2001 average.

- For a 10-percent reduction in grazing, 7,650 AUMs would be allowed on the refuge, supporting 1,570 head for 4.5 months. This reduction of 168 head would result in a revenue loss of \$46,933. There would be a decrease of less than 1 job (0.3) and \$6,562 in labor income in the range-fed cattle industry. It would have an impact of less than 1 job (0.6) and a decrease of \$12,775 in labor income throughout Jackson County.
- For a 64-percent reduction in grazing, 3,050 AUMs would be allowed on the refuge, supporting 626 head for 4.5 months. This reduction of 1,112 head would result in a revenue loss of \$310,213. There would be a decrease of 2.2 jobs and \$43,373 in labor income in the range-fed cattle industry. It would decrease countywide employment by 4.4 jobs (-0.39-percent of county employment) and labor income by \$84,441.

Under this CCP, it is anticipated the permittees will be able to depend on the refuge for a portion of their operations. While most of the permittees transfer to private land, it may be that permittees with high dependence on the refuge as part of their operation would have to cut production.

Recreational Activities

The abundance of recreational opportunities on federal and state lands makes Jackson County a popular recreation and tourism destination. Besides

the refuge, this county is home to the following areas:

- Mount Zirkel, Never Summer, Rawah, and North Platte River Wilderness Areas
- Sand Hills Recreation Area
- Routt National Forest
- Colorado State Forest
- More than 180,000 acres managed by the Bureau of Land Management
- Numerous state wildlife areas, including one of two gold medal trout lakes

These lands have many diverse uses including, recreation, wildlife management, livestock grazing, woodland products, and mineral resources. The Federal and State Governments manage 64 percent of Jackson County's land area (table 15). The refuge accounts for 2.4 percent of the county's land area and 4.6 percent of county land managed by the Federal Government.

The refuge offers visitors a variety of recreation opportunities including wildlife observation and photography, hunting, fishing, environmental education, and interpretation. Table 16 displays the

activities, estimated number of refuge visitors, and estimated daily expenditures related to use of the refuge.

Tourists usually buy a wide range of goods and services while visiting an area. Major expenditure categories include lodging, food, and supplies. Refuge personnel estimate that non-local visitors participating in hunting, fishing, and environmental education activities are state residents that live along the front range of Colorado (Fort Collins, Denver, and Colorado Springs). Therefore, state resident spending profiles for big-game hunting, small-game hunting, waterfowl hunting, and freshwater fishing were used.

Estimates for non-local interpretation and observation visitors are that approximately 40 percent are state residents from the front range area and 60 percent are non-resident visitors.

Although the economic impacts associated with current refuge visitation are somewhat limited in terms of overall tourism activities in the area, the refuge plays an important part in the overall recreational opportunities and scenic open space that makes North Park a popular tourist destination.

Table 15. Land area management in Jackson County and Colorado

<i>Area</i>	<i>Total Land Area (acres)</i>	<i>State Land (acres)</i>	<i>Federal Land (acres)</i>	<i>Private Land (acres)</i>	<i>State and Federal Land (%)</i>	<i>Private Land (%)</i>
Jackson County	1,036,497	124,765	541,073	370,659	64	36
Colorado	66,614,080	3,318,346	24,615,790	38,679,945	42	58

Source: Seidl and Garner 2001.

Table 16. Estimated annual visitors and daily expenditures, Arapaho National Wildlife Refuge, Colorado

<i>Activity</i>	<i>Number of Visitors</i>	<i>Daily Expenditures (per person per day)</i>	
		<i>State Residents (355)</i>	<i>Non-residents (6,751)</i>
Interpretation and observation	6,593	\$15	\$100
Environmental education	141	\$15	no data
Waterfowl hunting	280	\$21	no data
Big-game hunting	15	\$39	no data
Small-game hunting	18	\$42	no data
Fishing	59	\$28	no data
<i>Total</i>	<i>7,106</i>		

