United States Department of Agriculture
Forest Service
Intermountain Region

Ashley National Forest

Plan Revision

Socioeconomic Specialist Report

Ashley National Forest
355 North Vernal Ave.
Vernal, Utah 84078

September 2017

Prepared by:
Environmental Management and Planning Solutions, Inc.
3775 Iris Ave., Suite 1A
Boulder, Colorado 80027

TABLE OF CONTENTS

Chapter Page

TABLES

Page

FIGURES

Page

ACRONYMS AND ABBREVIATIONS

	Full Phrase
AUM	animal unit month
BLM	United States Department of Interior, Bureau of Land Management
CCF	hundred cubic feet
DHU	deer herd unit
FGNRA	United States Department of Agriculture, Forest Service, Ashley National Forest, Flaming Gorge National Recreation Area
Forest Service	United States Department of Agriculture, Forest Service
FSH	Forest Service Handbook
HM	head month
IMPLAN	Impact Analysis for Planning
mbf	thousand board feet
MMBF	million board feet
MMCF	million cubic feet
NFS	National Forest System
OHV	off-highway vehicle
PILT	payment in lieu of taxes
ROS	Recreation Opportunity Spectrum
SCC	species of conservation concern
SRS	Secure Rural Schools and Community Self-Determination
UDWR	Utah Department of Natural Resources, Division of Wildlife Resources
U.S.	United States
U.S. Bureau of Economic Analysis	United States Department of Commerce, Bureau of Economic Analysis
U.S. Bureau of Labor Statistics	United States Department of Labor, Bureau of Labor Statistics
U.S. Census Bureau	United States Department of Commerce, Census Bureau
VCC	vegetation condition class

This page intentionally left blank.

CHAPTER 1
INTRODUCTION

This report provides an assessment of the current social and economic conditions and trends in the area surrounding the United States Department of Agriculture, Forest Service, Ashley National Forest. In addition, this report addresses the key factors on the Ashley National Forest that influence the area's social and economic conditions from a multi-use approach. This report has been prepared in accordance with the 2012 National Forest System Planning Rule, as outlined in Forest Service Handbook (FSH) 1909.12, Chapter 10, Section 13.

1.1 REGION OF INFLUENCE

The Ashley National Forest falls predominantly within four counties on the northern border of Utah and southern border of Wyoming: Daggett, Duchesne and Uintah Counties in Utah, and Sweetwater County in Wyoming. In addition, Uinta County, Wyoming is in close proximity and has close economic ties to the Ashley National Forest. These primary five counties are referred to as the socioeconomic planning area. Detailed information related to current social and economic conditions in these counties is included throughout this report.

Additional secondary counties that have social and economic connections to the Forest include Utah and Wasatch Counties, Utah (which contain small portions of the Ashley) and Summit County, Utah (which shares a boundary with the Ashley's northern border). Details for these counties are included where relevant. See **Figure 1-1**, Socioeconomic Analysis Area, for details.

1.2 DATA SOURCES AND GAPS

This report incorporates the findings of the economic environment report prepared by Forest Service TEAMS (Forest Service 2017a). Baseline demographic and economic data collected for this report includes information from publicly available sources. These sources include but are not limited to, the U.S. Department of Commerce, Census Bureau (U.S. Census Bureau),

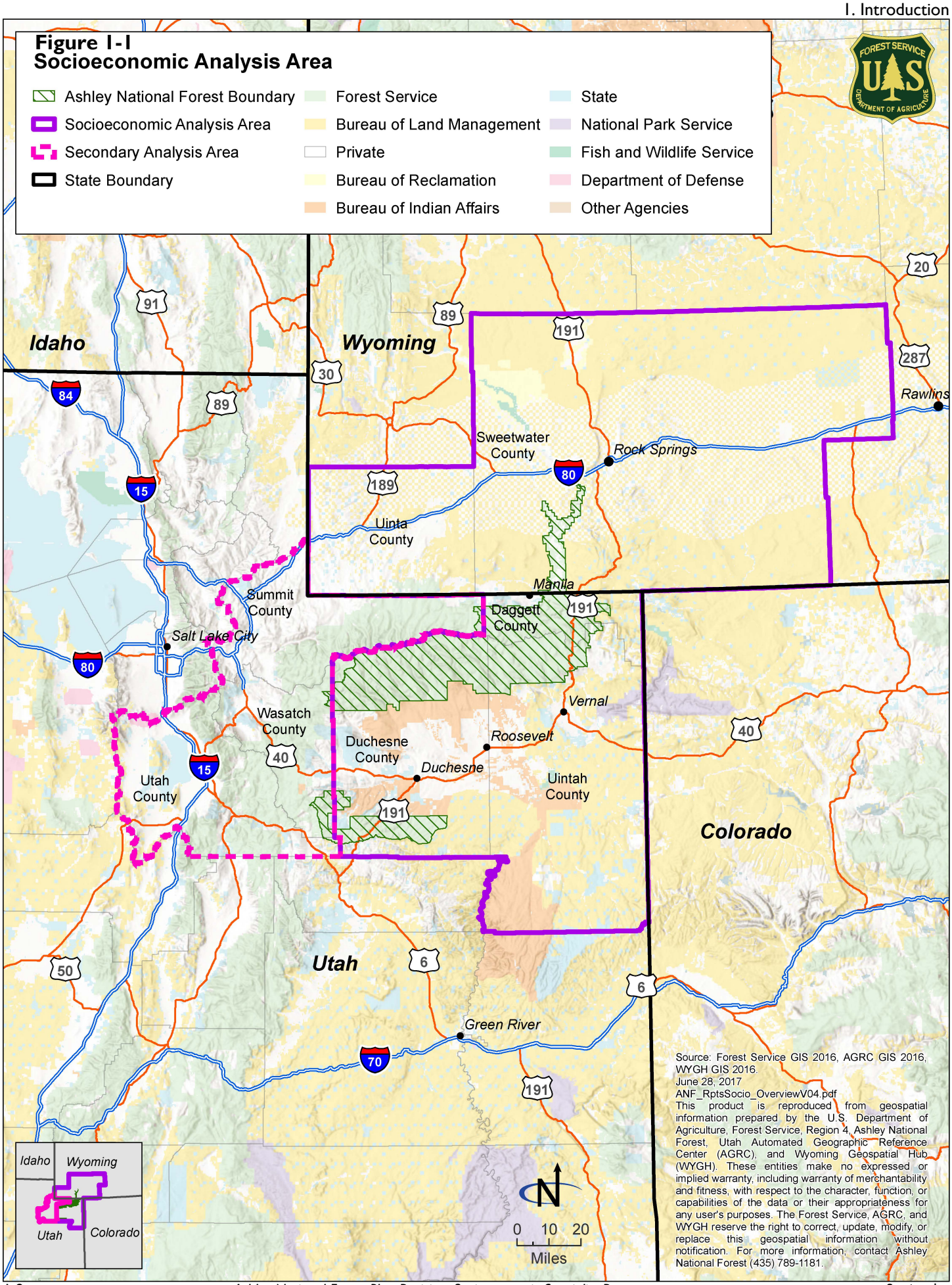


Figure 1-1
Socioeconomic Analysis Area
Ashley National Forest Boundary
Socioeconomic Analysis Area
Secondary Analysis Area
State Boundary
Forest Service
Bureau of Land Management
Private
Bureau of Reclamation
Bureau of Indian Affairs
State
National Park Service
Fish and Wildlife Service
Department of Defense
Other Agencies
Idaho
Wyoming
Colorado
Utah
Sweetwater County
Uinta County
Summit County
Daggett County
Wasatch County
Duchesne County
Uintah County
Utah County
Rock Springs
Rawlins
Manila
Vernal
Roosevelt
Duchesne
Salt Lake City
Green River
91
89
84
15
80
30
189
191
287
20
40
6
50
70
0 10 20
Miles
Source: Forest Service GIS 2016, AGRC GIS 2016, WYGH GIS 2016.
June 28, 2017
ANF_RptsSocio_OverviewV04.pdf
This product is reproduced from geospatial information prepared by the U.S. Department of Agriculture, Forest Service, Region 4, Ashley National Forest, Utah Automated Geographic Reference Center (AGRC), and Wyoming Geospatial Hub (WYGH). These entities make no expressed or implied warranty, including warranty of merchantability and fitness, with respect to the character, function, or capabilities of the data or their appropriateness for any user's purposes. The Forest Service, AGRC, and WYGH reserve the right to correct, update, modify, or replace this geospatial information without notification. For more information, contact Ashley National Forest (435) 789-1181.

U.S. Department of Commerce, Bureau of Economic Analysis (U.S. Bureau of Economic Analysis), and U.S. Department of Labor, Bureau of Labor Statistics (U.S. Bureau of Labor Statistics).

In addition, information from some sections used area profiles created from the Headwaters Institute Economic Profile System. Forest Service current and historical data are provided to summarize Ashley National Forest contributions and levels of use. Data are also included as appropriate from state wildlife management agencies.

Other reports, used as a baseline for further examination, are the 2009 Ashley National Forest Economic Environment report (Eichman 2009) and the 2008 Aspects of Beliefs and Values Regarding Resources and Management of the Ashley National Forest (Russell 2008). Relevant information from other specialist reports prepared for the ongoing plan revision are summarized and referenced as relevant.

Information for current Ashley National Forest conditions and contributions is provided based on best available Forest Service data. In some cases, comprehensive data for the Ashley National Forest were not available. Details for data sources and gaps for specific resources on the Ashely National Forest are included in the respective specialist reports.

The TEAMS report includes estimates of the Ashley National Forest's economic area, developed with Impact Analysis for Planning (IMPLAN) input-output modeling software (Minnesota IMPLAN Group 2014). This analysis examines the linkages and interdependencies among businesses, consumers, and Ashley resources, on which some area economic activity depends. IMPLAN is used to quantify the relationship between Ashley National Forest expenditures, local employment, labor income, and provide a more complete examination of these linkages (Eichman 2009).

IMPLAN not only examines the direct contributions from the Ashley National Forest, but also the indirect and induced effects. Indirect employment and labor income effects occur when a sector purchases supplies and services from other industries in order to produce their product. Induced effects are the employment and labor income generated as a result of spending new household income generated by direct and indirect employment. IMPLAN modeling produces information on the total (direct, indirect, and induced) economy impacts and employment. Employment is defined as any part-time, seasonal, or full-time job.

The four counties used to complete the economic contribution analysis were Daggett, Duchesne and Uintah Counties in Utah, and Sweetwater County in Wyoming. This economic analysis area was used to generate the National Forest Economic Contributions Report, as developed by the Ecosystem Management Coordination staff of the Forest Service Washington Office.

Results from the economic contribution analysis include the average annual number of local jobs, income, and Gross Regional Product supported in the area. Gross Regional Product includes employee compensation, proprietor income, property income, indirect taxes, licenses, and other sales, business fees, and taxes that are supported through natural resource management activities. Additionally, the product analyzes grazing, timber and mineral commodities, as well as recreational data using the National Visitor Use Monitoring Program data.

The other counties that either contain small portions of the Ashley National Forest or share boundaries with it, either do not draw enough of the above economic activity from the Ashley National Forest to make measurable economic contributions, or their economic activities are heavily tied to other economic areas. For example, Summit County, Utah may share a large border with the Ashley National Forest, but the majority of its natural resource management economic activity is drawn from the Uinta-Wasatch-Cache National Forest. Summit County is included in the functional economic area for the Uinta-Wasatch-Cache Forest.

1.3 SCALE OF ANALYSIS

Demographic and economic data are typically available at the county level. Social and economic influences are likely to extend beyond the boundaries of the Ashley National Forest to local and regional communities. As a result, the region of influence is defined at the county level. Where appropriate, information for specific factors can be included at the Forest or Ranger District level.

Chapter 2, Social, Cultural, and Economic Conditions includes demographics, information on economic well-being, and economic specialization for the counties in and around the Ashley National Forest. It includes data from all counties in the socioeconomic planning area. Ashley National Forest economic contributions, as discussed in **Chapter 3**, are estimated using IMPLAN economic modeling, provided for Daggett, Duchesne and Uintah Counties in Utah, and Sweetwater County in Wyoming, as discussed above. For the Multiple Use section (**Chapter 4**), discussion focuses on the Forest level; exceptions are noted.

CHAPTER 2
SOCIAL, CULTURAL, AND ECONOMIC CONDITIONS

Per the requirements outlined in FSH 1909.12 Land Management Planning Handbook, Chapter 10–The Assessments, Sections 13.2(1), 13.21, and 13.23, information is provided below for Ashley National Forest contributions to current socioeconomic planning area demographics, economics, and social setting. In addition, information is provided for environmental justice populations.

2.1 AREA OVERVIEW

The Ashley National Forest includes about 1.4 million acres in northeastern Utah and southwestern Wyoming. While a majority of the Ashley National Forest is in the Uinta Mountain Range, its diverse landscapes span three physiographic provinces that include the Uinta Mountains, Green River Basin, and Tavaputs Plateau. The area was first home to the indigenous Ute people and later to European settlers migrating from the East. Spanish explorers first visited the area in 1776. Subsequently, other explorers, including James Bridger, William Henry Ashley, and Kit Carson, continued to make contact with the Ute. But it was not until the arrival of Mormon settlers in 1847 that more sustained contact ensued. A history of conflict and dispute, similar to that of other tribal peoples in the western United States (U.S.), eventually resulted in the relocation and confinement of tribes to reservations, including the present-day tribal lands at Fort Duchesne (Nelson 1997).

Lands outside the Uintah Basin were a focus for early Mormon and other settlers. In the late 1870s, some early settlement began in the area, and this accelerated with the opening of Indian lands in the early 1900s. Mining, dairy cows, ranching, herding sheep, farming, and timbering were among the activities that focused the economies and lifestyles of the early settlements (Nelson 1997). The development of natural resources was fundamental to the history of these communities.

The area that now comprises the Ashley National Forest began as the Uintah Forest Reserve in 1897. The Forest Reserve greatly increased its territory when a presidential proclamation added more than a million acres from the Uintah and Ouray Indian Reservation in 1905. The Ashely National Forest was officially designated in 1908, which at the time comprised the south- and east-facing slopes of the Uinta Mountains. In 1953, the Ashley National Forest obtained the Rock Creek and Duchesne River drainages, the northwest slopes overlooking the Strawberry River Valley, as well as the Avintaquin Creek drainage. Flaming Gorge was added in 1968, after the dam's completion.

The Ashley National Forest is a two- to three-hour drive from any major population center, and it can be described as a rural forest with mainly traditional uses. Visitors to the Ashley National Forest come from all over the nation, with the High Uintas Wilderness and Flaming Gorge National Recreation Area (FGNRA) being especially popular destinations. Visitor use monitoring indicates that most visitors are from northern Utah (especially the Uinta Basin and Wasatch Front) and southern Wyoming. Compared with other national forests in Utah, the Ashley National Forest has relatively few private inholdings.

Typical uses and activities include:

- grazing
- commercial timber harvest
- oil and gas development (particularly in the southern portion of the Ashley)
- limited traditional hard rock mining
- firewood gathering
- land- and water-based recreational activities
- viewing scenery and historic sites

These natural resource-based lifestyles have resulted in several periods of boom and bust in local economies, with a recent boom and bust cycle related to oil and gas development. A variety of recreation settings, ranging from primitive to fully developed, exist.

Starting in the mid-2000s, Utah, the planning area, and the U.S. in general experienced a boom in shale oil and gas production. The shale oil is in an area known as the Eocene Green River Formation. This area includes the Uinta Basin in northeastern Utah, the Greater Green River Basin of southwestern Wyoming, and the Piceance Basin of northwestern Colorado. It is estimated, regardless of oil grade, that 4.285 trillion barrels of shale oil are located in this region (Birdwell 2013). In 2014, the price of oil dropped dramatically. As a result, the production of shale oil in the U.S. also began to decline. Shale oil is

expensive to retrieve compared with other methods. The decline in production has caused economic hardships throughout the planning area.

The economies of Duchesne, Uintah, and Sweetwater Counties were all highly dependent on the oil and gas industry. As such, the sharp decline in oil and gas has had wide implications, the results of which are discussed throughout this report. In short, the need to diversify the economy and save revenues during periods of economic expansion have been identified as potential solutions to current economic hardships. In the recent past, the area has become more increasingly dependent on tourism and the service sectors. The Uintah Mountains, Green River, and FGNRA attract visitors and residents to the area. Uintah County is also home to Dinosaur National Park and numerous heritage and pioneer museums (University of Utah 2015). Utah's highest mountain - King's Peak - is in Duchesne County. Other attractions in Duchesne County include several pristine, high-altitude lakes, Big Sandwash Reservoir, and Starvation State Park, which offer fishing and boating opportunities. The wildlife, water, scenery, and camping locations provided by the Green River also form a foundation for Sweetwater County's tourism and recreation sectors. The area also maintains a robust hunting and fishing sector that is an important contributor to the local economy (Taylor and Foulke 2016).

The Ashley National Forest is described as a "local forest" that is highly valued and extensively used by residents of adjacent communities. The five-county socioeconomic planning area has a total population of approximately 80,000, while the secondary counties in Wyoming and Utah have a total population of approximately 521,000. Most of this additional population is in Utah County, with a population of 476,760. The Uintah and Ouray Indian Reservation shares a substantial boundary with the Ashley National Forest and contributes more than 3,000 persons to the region's population.

2.2 AREA DEMOGRAPHICS

Understanding population age, size, density, and growth trends can help land managers make decisions that complement the current demand and foreseeable future use of resources. Population demographics are essential to understanding the outcome of specific management decisions on the social and natural environment within the socioeconomic planning area.

2.2.1 Age

Population age is an important factor of analysis when considering management actions on the Ashley National Forest. Different age groups have different needs, values, and attitudes concerning National Forest management. A younger than average age of the population can indicate the need for family-friendly activities and uses, such as a trail system with ranging degrees of difficulty. An older than average population, with extra mobility requirements, might increase the demand for easily accessible trailheads and camping.

Table 2-1, Percentage of the Population by Age Group, 2014, shows the median age and age distribution for each county. For comparison, Utah, Wyoming and the U.S. are also included. At 53.1, Daggett County has a median age well above average for both the U.S. and Utah. In addition, 25 percent of its population is over the age of 65. The median age for the other three counties mirror those of their respective states and are much lower than the U.S. average (37.4). With the exception of Daggett County, the socioeconomic planning area also has a smaller over 65 population and a higher population of children and young adults compared with the national average.

Table 2-1
Percentage of the Population by Age Group, 2014

Location	Median Age	% Pop Age 0-5	% Pop Age 5-9	% Pop Age 10-14	% Pop Age 15-19	% Pop Age 20-64	% Pop Age 65+
Utah Counties							
Daggett	53.1	6.2	3.6	4.3	4.6	56.4	24.8
Duchesne	30.2	10.5	9.4	8.8	7.5	52.8	10.9
Uintah	29.6	10.1	10.0	8.8	7.3	54.7	9.1
Wyoming Counties							
Sweetwater	33.3	7.8	6.8	8.4	6.7	61.5	8.7
Uinta	34.4	7.9	7.8	9.3	6.8	58.3	9.8
State of Utah	29.9	9.0	8.9	8.5	7.8	56.3	9.5
State of Wyoming	36.8	6.8	6.7	6.5	6.5	60.4	13.1
U.S.	37.4	6.4	6.5	6.6	6.8	59.9	13.7

Source: U.S. Census Bureau 2015

2.2.2 Population Size, Density, and Trends

Population Size

Table 2-2, Population in the Socioeconomic Planning Area (1990-2015), provides an overview of the population totals and change by specific towns, cities, and counties in the socioeconomic planning area. Populations for Utah and Wyoming are included for comparison.

In the socioeconomic planning area, Daggett County has the smallest population, with only 776 residents. Compared with the rest of the socioeconomic planning area, Daggett County experienced the smallest growth (12 percent) from 1990 through 2015. Sweetwater County has the largest population of the four counties - followed by Uintah, Duchesne, and Daggett Counties.

Duchesne and Uintah Counties had the highest population growth in the socioeconomic planning area. Both had growth rates near 60 percent; however, they remained below the Utah state growth rate of 65 percent. They did not come close to Utah, Summit, and Wasatch Counties' rates, which exceeded

Table 2-2
Population in the Socioeconomic Planning Area (1990-2015)

Location	1990	2000	2010	2014	2015	% Change 1990-2014
Utah	**1,722,850**	**2,233,169**	**2,763,885**	**2,858,111**	**2,903,379**	**69.0**
Daggett County	**690**	**921**	**1,059**	**714**	776	12
Dutch John	NA	NA	145	103	143	NA
Manila	207	308	310	193	128	-38
Duchesne County	**12,645**	**14,371**	**18,607**	**19,378**	**19,817**	**57**
Roosevelt	3,915	4,299	6,046	6,390	6,555	67
Duchesne	1,308	1,408	1,690	2,007	2,051	57
Uintah County	**22,211**	**25,224**	**32,588**	**34,576**	**35,721**	**61**
Vernal City	6,644	7,714	9,089	9,882	10,321	55
Utah County	**263,590**	**368,536**	**516,564**	**540,425**	**551,957**	**109.0**
Provo	86,835	105,166	112,488	114,804	115,345	33
Summit County	**15,518**	**29,736**	**36,324**	**37,877**	**38,521**	**148**
Park City	4,468	7,371	7,558	7,845	7,963	78
Coalville	1,065	1,382	1,363	1,678	1,502	41
Wasatch County	**10,089**	**15,215**	**23,530**	**25,550**	**26,661**	**164**
Herber	4,782	7,291	11,362	12,434	13,001	172
Midway	1,554	2,121	3,845	4,096	4,261	174
Wyoming	**453,588**	**493,782**	**563,626**	**575,251**	**579,679**	**28**
Sweetwater County	**38,823**	**37,613**	**43,806**	**44,595**	**44,772**	**15**
Green River	12,711	11,808	12,515	12,600	12,604	-1
Rock Springs	19,050	18,708	23,036	23,684	23,869	25
Uinta County	**18,705**	**19,742**	**21,118**	**20,989**	**20,930**	**12.2**

Source: U.S. Census Bureau 1990, 2000a, 2010a, 2015, 2016a

100 percent. These three counties are much closer to the large metropolitan areas of Salt Lake City and Provo, Utah, which provide additional economic activities that the five socioeconomic planning area counties lack.

Despite significant losses in high-wage mining employment and related sectors in the socioeconomic planning area, 2015 data indicate that the population remains relatively flat, compared with 2014.

The Utah Department of Workforce Services and the Wyoming Economic Analysis Division also provide county population data. However, not all demographic data, such as median age, ethnicity, and education attainment, are available from these sources. For consistency, the U.S. Census Bureau is the

primary source of demographic data. The population data provided above are from the U.S. Census Bureau's American Community Survey.

Residents in the rural communities associated with the Ashley National Forest perceive change associated with population growth, as captured in the following representative quote from the 2008 Beliefs and Values study (Russell 2008), "In the past we were a small town and it felt like a small town. We have one stop light and a few families. But now we have a lot of stoplights, there are lots of second home subdivisions, and the pace of life has changed. We are not a small town anymore" (Russell 2008). Some of this change is attributed to a perceived influx of oil and gas workers, and some is associated with rural and residential development.

Population Density

Population density can provide perspective on the availability of open space and recreational opportunities, civic infrastructure, population sustainability and growth potential, and a trend toward urbanization. The five counties in the socioeconomic planning area all have very low population densities (**Table 2-3**, Population Density (people per square mile)). Daggett County had only 1.5 people per square mile in 2010. Uintah County was the densest, with 7.3 people per square mile. In comparison, the state of Utah had 33.6 people per square mile. Wyoming had a very low population density of 5.8 people per square mile, which is similar to Sweetwater County's population density of 4.2 people per square mile.

Table 2-3
Population Density (people per square mile)

Location	2000	2010
Utah		
Daggett County	1.3	1.5
Duchesne County	4.4	5.7
Uintah County	5.6	7.3
Wyoming		
Sweetwater County	3.6	4.2
Uinta County	9.5	10.1
State of Utah	27.2	33.6
State of Wyoming	5.1	5.8
U.S.	79.6	87.4

Sources: U.S. Census Bureau 2000b, 2010a

None of the five counties contain a major metropolitan area. The two largest cities in the five-county socioeconomic planning area are Rock Springs and Green River in Wyoming. Their populations are 23,869 and 12,604, respectively. The largest cities/towns in the other three counties do not exceed a population of 10,000. See **Table 2-2**, Population in the Socioeconomic Planning Area (1990-2015).

Population Immigration and Emigration

Population changes can be attributed to natural increases (where the birth rate exceeds the death rate), and to both international and domestic immigration and emigration. Population change can have far-reaching impacts on housing availability, public services such as healthcare and education, employment rates, and the availability of quality recreational opportunities. This is especially true of migration-induced population change, because it can occur quickly over time.

Population projections suggest that migration, not natural population growth, will likely play an increasing role in population changes within the U.S. as birth and death rates continue to stabilize. Between 2010 and 2015, immigration was responsible for 19 percent of population growth in Utah and 27 percent of population growth in Wyoming. **Table 2-4**, Net Migration from 2010 to 2015, shows both domestic and international migration trends in Daggett, Duchesne, Uintah, Sweetwater, and Uinta Counties and compares these trends to Utah and Wyoming trends.

Table 2-4
Net Migration from 2010 to 2015

Location	International Net Migration	Domestic Net Migration	Net Migration
Utah			
Daggett County	4	16	20
Duchesne County	43	613	656
Uintah County	114	2,621	2,735
Wyoming			
Sweetwater County	31	-1,074	-1,043
Uinta County	-53	-1,217	-1,270
State of Utah	29,344	14,576	43,920
State of Wyoming	2,932	3,129	6,061

Source: U.S. Census Bureau 2015

The distribution of population growth among the five county socioeconomic planning area is notable. Sweetwater and Uinta Counties, both in Wyoming and on the northern side of the Ashley National Forest, showed a negative net migration trend between 2010 and 2015. Daggett County, Utah - also on the northern side of the Ashely National Forest - had a very low net migration of 20 persons between 2010 and 2015. Duchesne and Uintah Counties, both in Utah and on the southern side of the Ashley National Forest, showed moderate population growth due to immigration between 2010 and 2015 (U.S. Census Bureau 2015).

2.3 EDUCATIONAL ATTAINMENT

The education level attained is one of the most compelling indicators of economic success and well-being. National median earnings increase drastically with higher education levels, with bachelor's degree holders earning an average

of $22,647 more per year than those who only attain a High School diploma or equivalency degree (U.S. Census Bureau 2015). Historically, communities with a more educated workforce tend to have higher incomes, have faster growth rates, and are better able to withstand economic downturns and recessions.

As a whole, the socioeconomic planning area's share of high school graduates is lower than the respective state comparison populations. Additionally, the socioeconomic planning area counties have much smaller shares of individuals with bachelor's degrees or higher than the respective state or the national average (**Table 2-5**, Educational Attainment, Percentage of Total Population Over Age 25 (2014); data in bold indicate values that are not statistically significant due to small sampling sizes and should be interpreted with caution).

Table 2-5
Educational Attainment, Percentage of Total Population Over Age 25 (2014)

	Daggett	Duchesne	Uintah	Sweetwater	Uinta	Utah	Wyoming	U.S.
Total Population over 25 years of age	509	11,116	19,720	28,269	13,046	1,642,728	381,098	209,056,129
				% of Population				
No High School Degree	**12.4**	13.5	12.6	9.5	**10.8**	9.0	7.7	13.7
High School Graduate	87.6	86.5	87.4	90.5	89.2	91.0	92.3	86.3
Associates Degree	**9.2**	8.4	8.6	9.2	9.6	9.5	10.4	7.9
Bachelor's Degree or Higher	**19.3**	15.4	16.6	18.1	18.7	30.6	25.1	29.3
Bachelor's Degree	**14.9**	10.7	12.0	13.0	13.6	20.5	16.8	18.3
Graduate or Professional	**4.3**	4.7	**4.5**	5.1	5.1	10.2	8.3	11.0

Note: Data in bold indicate values that are not statistically significant due to small sampling sizes and should be interpreted with caution.
Source: U.S. Census Bureau 2015

2.4 HOUSING STATISTICS

Housing statistics are important measures used to gauge the economic stability of a region. High rates of rental units can indicate trends such as a migrant workforce, seasonal tourism, or a sudden economic uptick in an area. Additionally, high rates of home ownership can predict long-term economic stability and a positive outlook on the region's economic future. Data on vacancy rates can be indicative of the economic stability of an area or whether the area has a high rate of vacation or seasonal housing, while median home values are an important indicator of the socioeconomic well-being of an area. See **Table 2-6**, Median Home Values, 2014. The factors of home tenure, vacancy rates and cyclical trends can be useful for land management agencies to gauge the seasonal and future demand for resources.

Table 2-6
Median Home Values, 2014

Location	Median Home Values (Owner-Occupied housing units)
Utah	
Daggett County	$202,500
Duchesne County	$172,300
Uintah County	$187,400
Wyoming	
Sweetwater County	$183,400
Uinta County	$174,800
State of Utah	$212,500
State of Wyoming	$189,300
U.S.	$175,700

Source: U.S. Census Bureau 2015

Median home values in 2014 of owner-occupied housing units in the socioeconomic planning area are similar to median home values of Utah, Wyoming, and the U.S.. The highest median home value in the socioeconomic planning area was in Daggett County ($202,500). The lowest median home value occurred in Duchesne County ($172,300), but this data point is statistically equivalent to the U.S. median home value of $175,700 (U.S. Census Bureau 2015).

An average of 74 percent of homes in the socioeconomic planning area are owner-occupied housing units (U.S. Census Bureau 2015). This is comparable to similar data points for Utah, Wyoming and the U.S., where owner-occupied housing units comprise 69.7 percent, 69.3 percent, and 64.4 percent of housing units, respectively (**Table 2-7**, Housing Tenure of Occupied Units).

Table 2-7
Housing Tenure of Occupied Units

Tenure	Daggett	Duchesne	Uintah	Sweet-water	Uinta	State of Utah	State of Wyoming	U.S.
Occupied Housing Units	276	6,738	11,048	16,687	7,557	896,194	225.514	116,211,092
Percentage owner-occupied units	79.3	75.2	75.2	70.6	70.4	69.7	69.3	64.4
Percentage renter-occupied units	20.7	24.8	24.8	29.4	29.6	30.3	30.7	35.6

Source: U.S. Census Bureau 2015

Housing vacancy rates include:

- housing units for rent
- units rented but not occupied

- units for sale
- units sold but not occupied
- units for seasonal recreational or occasional use
- units for migratory workers
- units vacant due to "other"

In 2010, out of all the housing units that were classified as vacant, 93 percent in Daggett County and 80 percent in Duchesne County are categorized "for seasonal, recreational, or occasional use." This is in comparison to only 22 percent of vacant homes in Uintah County, 13 percent in Sweetwater County, and 22 percent in Uinta County categorized for the same use. This indicates that vacation homes, second homes, and vacation rental properties are likely common in Daggett and Duchesne Counties (U.S. Census Bureau 2010b). Overall, Daggett County has the highest proportion of vacant housing units at 76 percent (see **Table 2-8**, Housing Occupancy).

Table 2-8
Housing Occupancy

	Daggett	Duchesne	Uintah	Sweetwater	Uinta
Total Housing Units	1,153	9,634	12,453	18,938	8,745
Occupied Housing Units	276	6,738	11,048	16,687	7,557
Vacant Housing Units	877	2,896	1,405	2,251	1,188

Source: U.S. Census Bureau 2015

2.5 ENGLISH PROFICIENCY/LANGUAGE DIVERSITY

Community members who are uncomfortable communicating in English will have difficulty participating in the Forest planning process. Issued in 2000, Executive Order 13166, Improving Access to Services for Persons with Limited English Proficiency, requires federal agencies to identify any need to provide their services to those with limited English proficiency. The order requires the development and implementation of services so that limited English proficiency persons can have meaningful access to the services without undue burden on the agency. Nongovernmental organizations that are recipients of federal financial assistance are also required by the order to provide meaningful access to limited English proficiency persons.

Data on the share of the population who speak English less than "very well" can highlight barriers to public participation and equal access to government services. Because of the smaller populations of the counties, the statistical significance of the data on who speaks English less than very well is not high. Daggett County appears to have a higher percentage of people who do not speak English very well relative to Utah, but its statistical value is quite low. As a whole, the socioeconomic planning area does not appear to include many individuals who cannot speak English very well. See **Table 2-9**, Percentage of the Population Who Speak English Less Than "Very Well," 2014.

Table 2-9
Percentage of the Population Who Speak English Less Than "Very Well," 2014

	Daggett	Duchesne	Uintah	Sweetwater	Uinta	State of Utah	State of Wyoming	U.S.
Speaks English Less Than Very Well	**6.1**	**3.0**	**2.0**	**3.6**	**2.5**	1.9	5.3	8.6

Note: Data in bold indicate values that are not statistically significant due to small sampling sizes and should be interpreted with caution.
Source: U.S. Census Bureau 2015

2.6 MINORITY AND NATIVE AMERICAN GROUPS

Issued in 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was established to ensure the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of federal environmental laws, regulations, and policies. Fair treatment means that no specific group of people, including racial, ethnic, or socioeconomically defined communities, should bear a disproportionate share of the negative environmental consequences resulting from the execution of federal, state, local, and tribal programs and policies.

To the extent practical and appropriate, federal agencies shall use this information to determine whether their programs, policies, and activities have disproportionately high and adverse human health or environmental effects on minority or low-income populations. Guidance on environmental justice terminology and identifying minority populations was developed by the President's Council on Environmental Quality and provides the following definitions:

- Minorities are individuals who are members of the following population groups: American Indian, Alaska Native, Asian, Pacific Islander, Black, or Hispanic
- A minority population area is so defined if either the aggregate population of all minority groups combined exceeds 50 percent of the total population in the area, or if the percentage of the population in the area comprising all minority groups is meaningfully greater than the minority population percentage in the comparison population
- For the purpose of identifying a minority population concentration, the comparison population used in this report was the residing states of the respective counties, either Utah or Wyoming

Table 2-10, Population Percentages by Ethnicity and Race, represents the population percentages of the socioeconomic planning area by ethnicity and race, and identifies minority populations within the socioeconomic planning area. Ethnicity is characterized by those who either identify as having Hispanic or Latino origin, or not having any Hispanic or Latino origin. Race subgroup data are provided for individuals who do not identify as Hispanic or Latino.

Table 2-10
Population Percentages by Ethnicity and Race

	Daggett	Duchesne	Uintah	Sweetwater	Uinta	State of Utah	State of Wyoming	U.S.
Hispanic or Latino (any race)	**2.8**	7.2	7.7	15.7	8.9	13.3	9.4	16.9
Not Hispanic or Latino (any race)	97.2	92.8	92.3	84.3	91.9	86.7	90.6	83.1
White Alone	91.9	86.1	82.4	80.1	88.0	79.8	84.8	62.8
Native American	**0.7**	4.8	7.2	0.1	**0.2**	1	2.0	0.7
Two or more races	**0.4**	**0.9**	**1.7**	2.1	2.8	1.8	1.8	2.1

Note: Data in bold indicate values that are not statistically significant due to small sampling sizes and should be interpreted with caution. Only those races with statistical significance are included in the table: White Alone, American Indian, and two or more races. As a result, subgroup race data do not sum to 100 percent.
Source: U.S. Census Bureau 2015

The socioeconomic planning area is majority white, of non-Hispanic origin. Daggett County is almost exclusively white. Duchesne and Uintah Counties are more diverse; both have small populations of American Indians and individuals who identify as Hispanic. Sweetwater County has the largest population of individuals who identify as Hispanic or Latino in the socioeconomic planning area, with a rate nearly identical to the national average. Uinta County, Wyoming mirrors the state of Wyoming. Wyoming is predominantly white, with a Hispanic population around 9 percent.

Duchesne and Uintah Counties encompass large portions of the Uintah and Ouray Indian Reservation. There are approximately 651 and 2,294 Ute American Indians, respectively, in each county (U.S. Census Bureau 2015). The Ute and Ouray Reservations are in a three-county area known as the Uintah Basin. It covers an area greater than 4.5 million square miles and shares boundaries with the Ashley National Forest. In 2013, the Ute Tribal Membership was reported at 2,970 (Ute Indian Tribe 2013).

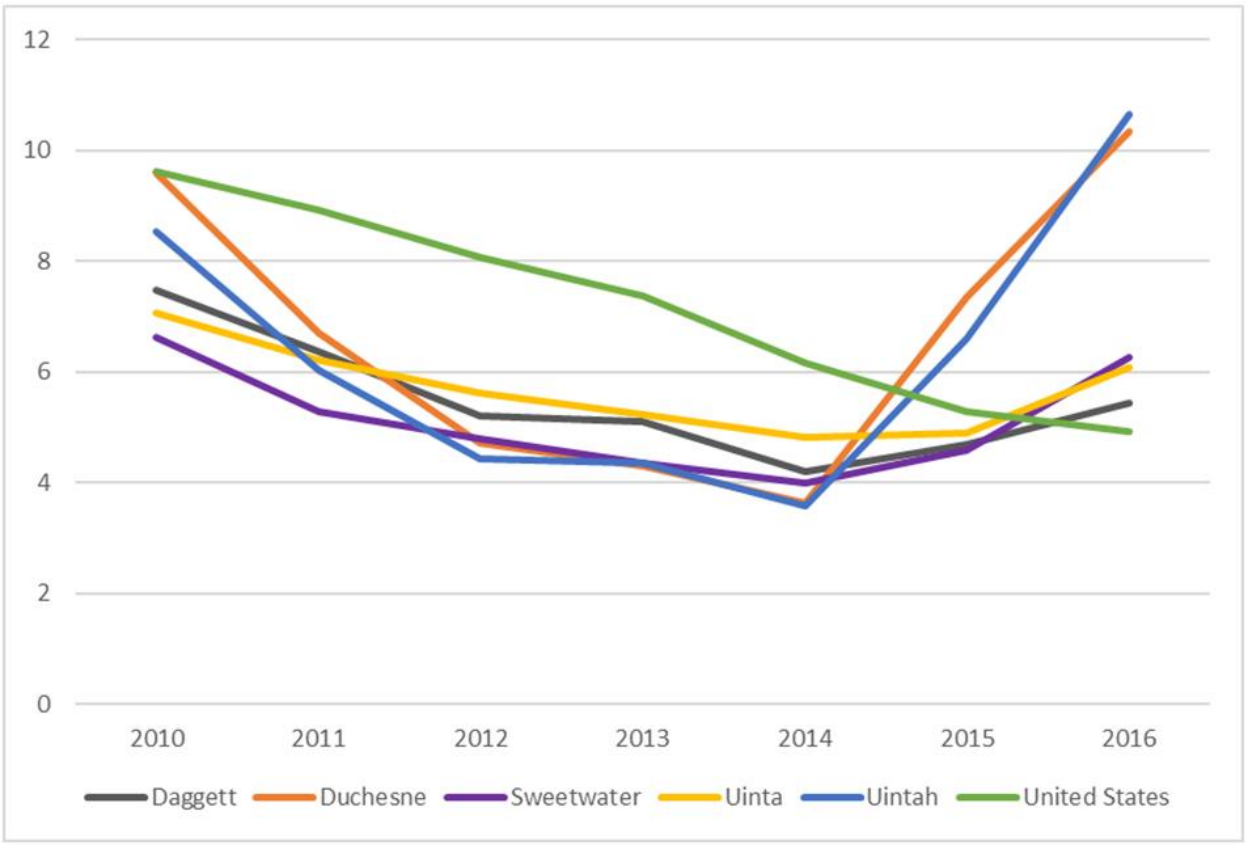
2.7 EMPLOYMENT AND UNEMPLOYMENT

Employment and unemployment information for the socioeconomic planning area includes jobs supported directly and indirectly by Ashley National Forest resources, as well as those supported by other state, federal, and private lands. Where available, information specific to the Ashley National Forest, as based on IMPLAN modeling results for the economic analysis area, is included.

2.7.1 Unemployment Data and Trends

Figure 2-1, Average Unemployment Rate 2010-2016, provides average annual unemployment data for each of the five counties in the socioeconomic planning area from 2010 to 2016. The socioeconomic planning area has seen unemployment rates well below the national average and has withstood the Great Recession far better than the U.S. as a whole. However, from 2014 to 2016, there was a spike in unemployment in Duchesne and Uintah Counties that averaged 9.1 and 9.5 percent, respectively. These rates are at or above Great Recession levels for all but Daggett County (U.S. Bureau of Labor Statistics 2016). The unemployment trends experienced by the socioeconomic planning area are the result of a boom and bust in the shale oil and gas industry, which is happening nationwide.

Figure 2-1
Average Unemployment Rate, 2010-2016

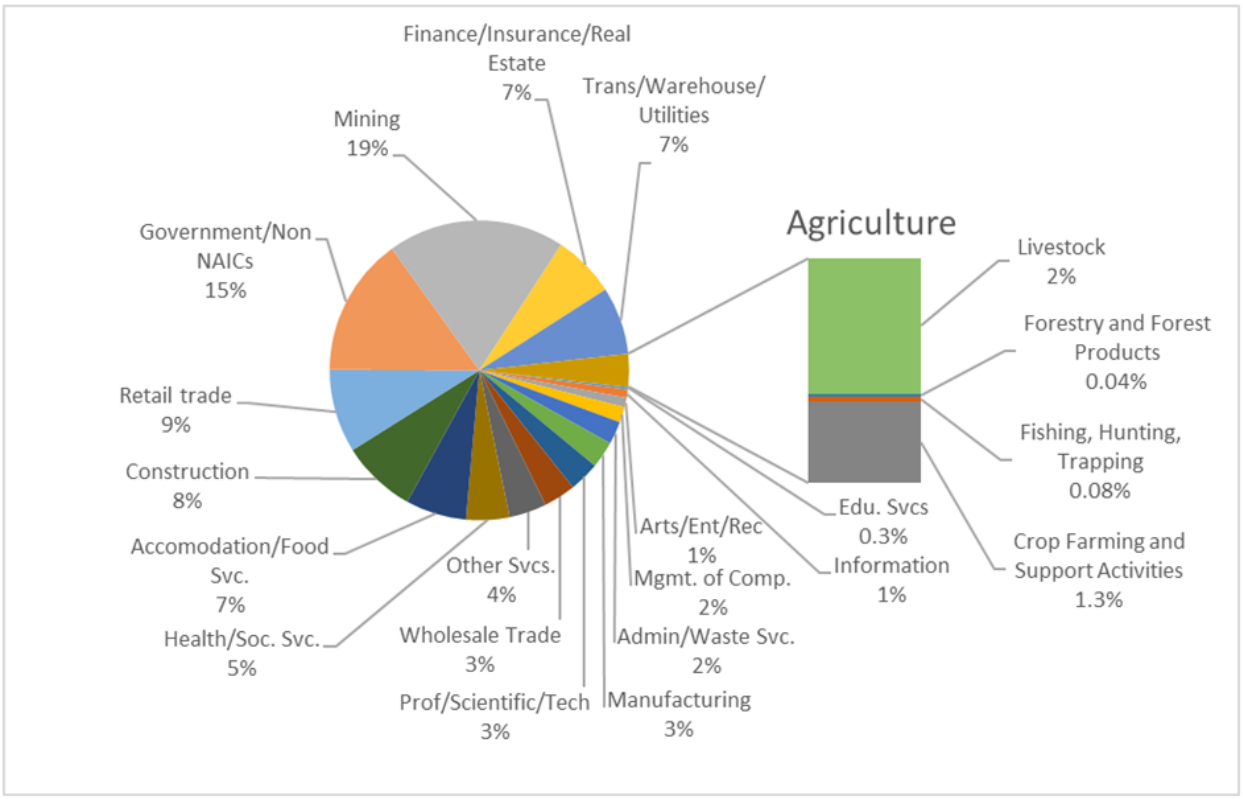


Note: All employment rates are unadjusted for seasonal employment.
Source: U.S. Bureau of Labor Statistics 2016

2.7.2 Economic Specialization and Employment

The employment distribution for the five-county socioeconomic planning area is shown in **Figure 2-2**, Socioeconomic Planning Area Employment Distribution, 2014. The largest employment sector is mining (19 percent), followed by government (15 percent) and retail (nine percent). The next largest sector is construction (eight percent), followed by a variety of service industries that have an employment distribution ranging from one to seven percent. Agriculture is a relatively small piece of the economy (3.4 percent). Ashley National Forest products, which include the timber industry, is the smallest employment sector, accounting for only 0.04 percent of employment. The employment distribution in the socioeconomic planning area is shown in **Figure 2-2**, below.

Figure 2-2
Socioeconomic Planning Area Employment Distribution, 2014



Source: U.S. Bureau of Economic Analysis 2014a

Daggett County, Utah

In 2014, Daggett County's largest employment industry was government (22 percent), followed by other services (17 percent), professional and scientific services (11 percent), then accommodations and food services and construction (eight percent). Unlike the other planning area counties, Daggett County is not as specialized or reliant on the mining industry (5.5 percent), and agriculture was seven percent of its employment sector (U.S. Bureau of Economic Analysis 2014a). In 2015, data from the Utah Department of Workforce Services (2016a)

indicate that Daggett County had no mining-related jobs, and the government sector was 53 percent of its employment sector.

In January 2017, the Utah Department of Workforce Services reported that Daggett County's employment is dominated by the leisure and accommodation industry, centered on the Flaming Gorge Dam (Utah Department of Workforce Services 2017). Small population size and year-to-year fluctuations account for the discrepancies between Utah Department of Workforce Services data and U.S. Bureau of Economic Analysis data shown here.

Duchesne County, Utah

In 2014, Duchesne County's main employment industry was mining (21 percent), followed by government (14 percent) and retail trade (eight percent); agriculture was 6.6 percent. However, the mining industry has changed significantly since 2014 (U.S. Bureau of Economic Analysis 2014a). According to the Utah Department of Workforce Services, employment in the mining sector had fallen from an average of 2,540 employed in 2014, to 1,644 employed in the fourth quarter of 2015. By the end of 2015, mining remained 21 percent of the total employment industry, but only because unemployment had risen from 4.8 percent in January 2015 to 8.2 percent in December 2015 (Utah Department of Workforce Services 2016a). In January 2017, the Utah Department of Workforce Services reported that Duchesne County's job market is improving, and all economic indicators are improving, in response to higher oil prices (Utah Department of Workforce Services 2017).

Uintah County, Utah

In 2014, Uintah County's main employment industry was mining (18 percent), followed by government (15 percent), retail trade (10 percent), and construction (eight percent); agriculture was 4.9 percent (U.S. Bureau of Economic Analysis 2014a). Uintah County experienced similar reductions in employment as Duchesne County. In 2014, employment in the mining sector was 3,212. By the fourth quarter of 2015, total mining jobs fell to 2,122 employed (Utah Department of Workforce Services 2016a). In January 2017, the Utah Department of Workforce Services reported that Uintah County's labor market is stabilizing and showing signs of improvement. Despite the county continuing to shed mining employment, the rate of loss is much lower than previous years (Utah Department of Workforce Services 2017).

Sweetwater County, Wyoming

In 2014, Sweetwater County's employment distribution was dominated by the mining sector (20 percent), followed by government (15 percent) and retail trade (nine percent); agriculture was only 1.1 percent (U.S. Bureau of Economic Analysis 2014a). In the third quarter of 2015, the Wyoming Department of Employment reported a 24 percent statewide reduction in mining (county details are not reported). Additionally, the construction, real estate, and transportation/machinery manufacturing industries experienced steep declines,

largely a result of the loss of mining employment and incomes (Wyoming Department of Employment 2015).

Uinta County, Wyoming

In 2014, the largest employment industry was the government sector (17 percent), followed by health and social services (11.5 percent), retail (11 percent), mining (6.4 percent); and construction (one percent), the agriculture sector accounted for 3.5 percent of employment distribution (U.S. Bureau of Economic Analysis 2014a).

2.8 ECONOMIC WELL-BEING AND POVERTY

2.8.1 Labor and Personal Income

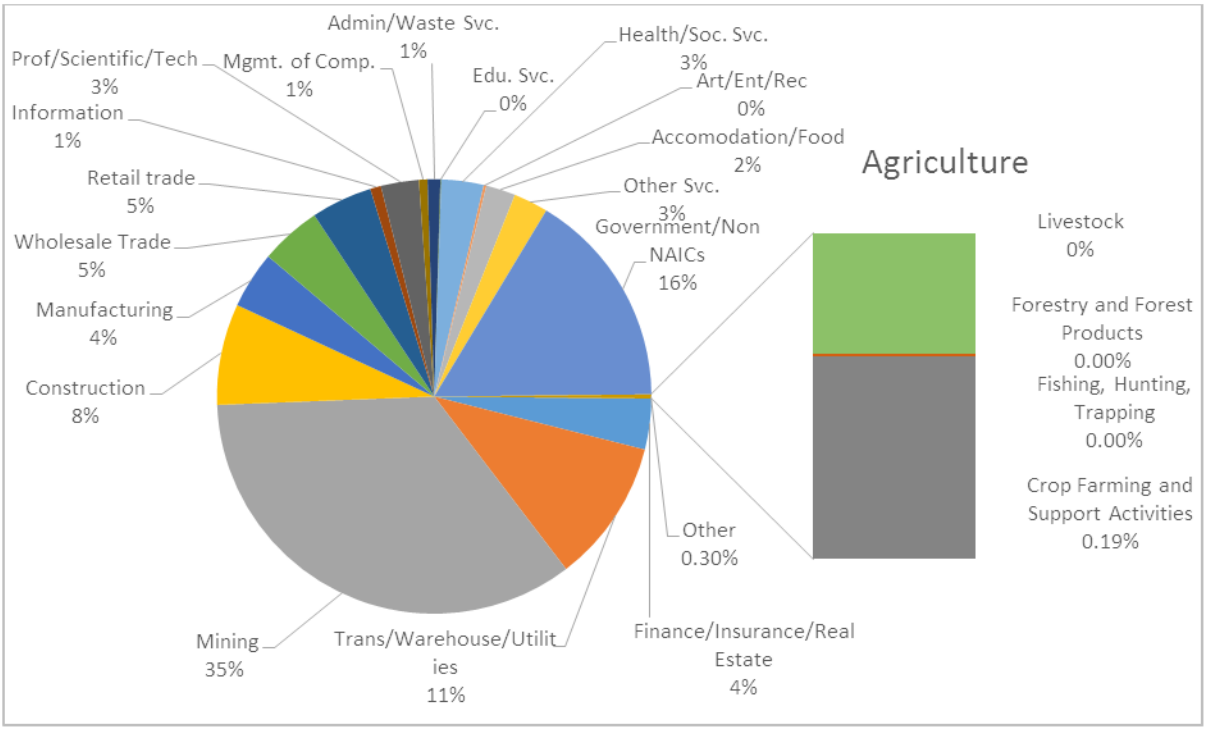
Sources of labor income are listed in **Figure 2-3**, Analysis of Labor Income Distribution by Industry, below. In 2014, the largest sources of labor income in the socioeconomic planning area were from mining and government industries. In 2006, mining and government were also the largest sources of labor income. However, the mining sector has grown from 24 percent in 2006 to 35 percent in 2014. These data indicate that mining jobs pay well relative to other jobs in the five-county area. While mining accounts for 19 percent of employment (see **Figure 2-2**, Socioeconomic Planning Area Employment Distribution, 2014, above), it accounts for 35 percent of labor income. All other labor income industries have remained relatively similar since 2006.

Labor income accounts for approximately 80 to 86 percent of total household earnings in the socioeconomic planning area, with the exception of Daggett County. As previously discussed, Daggett County has a very large over 65 population (25 percent of residents are over the age of 65). As such, only 60 percent of Daggett County household earnings come from labor income. The remainder comes from non-labor sources such as retirement income and social security. The percentage of residents who rely on social security and retirement income in Daggett County is nearly double that of the other counties in the socioeconomic planning area (U.S. Census Bureau 2015).

2.8.2 Per Capita and Median Household Incomes

The 2014 and 2015 per capita and median household incomes for each county in the socioeconomic planning area are shown in **Table 2-11**, Per Capita and Median Household Incomes, below. Incomes have risen marginally across the socioeconomic planning area since 2010, with the exceptions of Sweetwater and Uinta Counties in Wyoming, where incomes peaked in 2011. Per capita income in Sweetwater County peaked in 2011 at $31,125, and household income peaked at $72,096. Uinta County per capita income peaked in 2011 at $25,660, and household income peaked at $59,851 (U.S. Census Bureau 2015).

Figure 2-3
Analysis of Labor Income Distribution by Industry, 2014



Source: U.S. Bureau of Economic Analysis 2014b

Table 2-11
Per Capita and Median Household Incomes 2014-2015[1]

Location	Per Capita Income		Median Household Income	
	2014	2015	2014	2015
Utah Counties				
Daggett County	$24,397	$22,149[2]	$47,244	$56,750
Duchesne County	$24,190	$23,576	$60,772	$61,133
Uintah County	$24,601	$24,720	$62,437	$66,185
Wyoming Counties				
Sweetwater County	$30,536	$30,568	$69,4530	$69,022
Uinta County	$25,808	$25,772	$56,224	$56,569
State of Utah	$24,340	$24,686	$59,917	$60,727
State of Wyoming	$29,415	$29,803	$58,321	$58,840
U.S.	$28,589	$28,930	$53,545	$53,889

Notes: [1]$2015 dollars. 2014 data were converted using U.S. Bureau of Economic Analysis Consumer Price Index inflation calculator (U.S. Bureau of Economic Analysis 2017).
[2] Due to the small population size of Daggett County, per capita income statistics have a margin of error +/- $4,614.
Source: U.S. Census Bureau 2015, 2016a

2.8.3 Individuals and Families in Poverty

As discussed in **Section 2.6**, Minority and Native American Groups, Executive Order 12898 requires fair treatment and meaningful involvement of minority and low-income populations with respect to the development, implementation, and enforcement of federal environmental laws, regulations, and policies. The President's Council on Environmental Quality provides the following definitions for low-income populations:

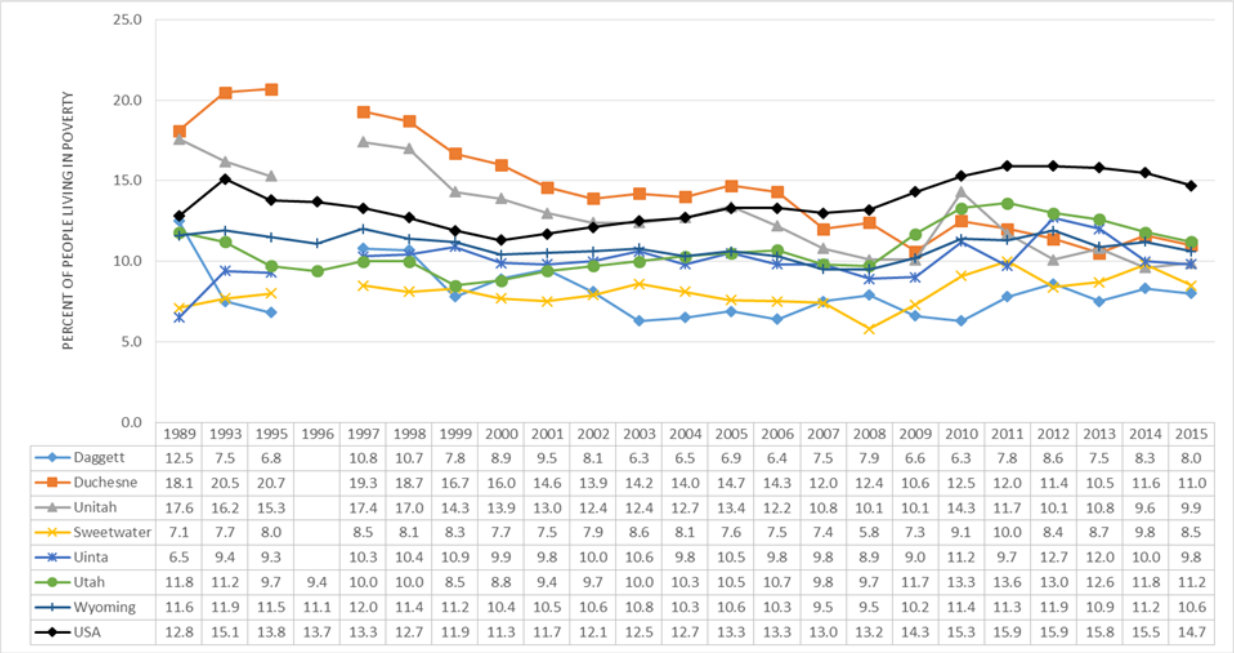
- A low-income population is determined based on annual statistical poverty thresholds developed by the U.S. Census Bureau. In 2014, the poverty level was based on a total income of $12,316 for an individual under age 65 and $24,418 for a family of four (U.S. Census Bureau 2016c).
- A low-income community may include either a group of individuals living in geographic proximity to one another or dispersed individuals, such as migrant workers or Native Americans.
- For the purpose of identifying a low-income population concentration, the comparison population used in this report was the residing states of the respective counties, either Utah or Wyoming.

Figure 2-4, below, shows trends in the percentage of the population in each county living below poverty. For comparison, Utah, Wyoming, and the U.S. are included. Poverty level is an important measure of economic well-being within a region. People living in poverty may be more vulnerable to changes in Forest management or the availability of opportunities on the Ashley National Forest. For instance, low-income households may have fewer resources to engage in substitute activities if Ashley National Forest resource availability changes.

All five counties in the socioeconomic planning area currently experience poverty levels below the national average and have rates equal to or less than their respective states. Uinta County in Wyoming experienced the highest percentages of poverty, while Daggett County experienced the lowest. In the early 1990s, Duchesne and Uintah Counties experienced poverty rates significantly higher than the planning area, the nation, and their respective states. However, poverty since has been reduced by nearly half. Long-term trends for the rest of the planning area have been comparatively low and flat, meaning there has been neither a sharp reduction nor an increase in poverty over the period examined.

Data in **Figure 2-4** are reported in aggregate. When reporting poverty in aggregate, it may mask some of the underlying trends associated with poverty. For example, Uintah County has a large population of American Indians from the Ute Tribe. American Indians are a minority population who have typically

Figure 2-4
Percentage of People Living Below Poverty, 1989-2015



	1989	1993	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Daggett	12.5	7.5	6.8		10.8	10.7	7.8	8.9	9.5	8.1	6.3	6.5	6.9	6.4	7.5	7.9	6.6	6.3	7.8	8.6	7.5	8.3	8.0
Duchesne	18.1	20.5	20.7		19.3	18.7	16.7	16.0	14.6	13.9	14.2	14.0	14.7	14.3	12.0	12.4	10.6	12.5	12.0	11.4	10.5	11.6	11.0
Unitah	17.6	16.2	15.3		17.4	17.0	14.3	13.9	13.0	12.4	12.4	12.7	13.4	12.2	10.8	10.1	10.1	14.3	11.7	10.1	10.8	9.6	9.9
Sweetwater	7.1	7.7	8.0		8.5	8.1	8.3	7.7	7.5	7.9	8.6	8.1	7.6	7.5	7.4	5.8	7.3	9.1	10.0	8.4	8.7	9.8	8.5
Uinta	6.5	9.4	9.3		10.3	10.4	10.9	9.9	9.8	10.0	10.6	9.8	10.5	9.8	9.8	8.9	9.0	11.2	9.7	12.7	12.0	10.0	9.8
Utah	11.8	11.2	9.7	9.4	10.0	10.0	8.5	8.8	9.4	9.7	10.0	10.3	10.5	10.7	9.8	9.7	11.7	13.3	13.6	13.0	12.6	11.8	11.2
Wyoming	11.6	11.9	11.5	11.1	12.0	11.4	11.2	10.4	10.5	10.6	10.8	10.3	10.6	10.3	9.5	9.5	10.2	11.4	11.3	11.9	10.9	11.2	10.6
USA	12.8	15.1	13.8	13.7	13.3	12.7	11.9	11.3	11.7	12.1	12.5	12.7	13.3	13.3	13.0	13.2	14.3	15.3	15.9	15.9	15.8	15.5	14.7

Source: U.S. Census Bureau 2016c

experienced higher than average poverty levels. However, due to small sampling sizes at the county level, data on poverty levels by race and ethnicity may not be reliable.

2.9 PUBLIC SAFETY AND SERVICES

Planning officials look to the emergency response, emergency preparedness, and law enforcement efforts in the socioeconomic planning area to help make reasoned decisions regarding visitor protection, resource protection and access. Many land management decisions, especially fire suppression or emergency response, must be made in conjunction with other governmental or law enforcement agencies to enact coherent strategies during emergency response. A summary of emergency response and public safety services, as well as crime rates in the socioeconomic planning area, are discussed below.

2.9.1 Public Safety and Services by County

Daggett County, Utah

Daggett County is served by the Daggett County Sheriff's Office. The Daggett County Sheriff's Office also provides security services for the Flaming Gorge Dam on the Ashley National Forest. The Manila Fire Department and the Dutch John Fire Department provide fire suppression and emergency response in Daggett County. Emergency services for Daggett County are dispatched through a consolidated dispatch center in Vernal, Utah (Daggett County 2016).

Duchesne County, Utah

The Duchesne County Sheriff's Department, Myton Police Department, and Roosevelt Police Department all serve Duchesne County. The Duchesne County Sheriff's Department is the largest of these law enforcement agencies and employees 60 people, including 21 patrol officers. Seven fire departments - four city and three county departments - with a total of 95 volunteer firefighters, cover emergency response and fire suppression efforts in Duchesne County (Duchesne County 2016).

Sweetwater County, Wyoming

The Sweetwater County Sheriff's Department and Sweetwater County Fire Department provide emergency response assistance and fire suppression services. The county has four fire districts (Reliance, Jamestown Rio Vista, Fire District # I, and Eden Valley). In addition, the County has on-call compensated staff, and mutual-aid agreements with other fire departments - including the U.S. Department of the Interior, Bureau of Land Management - to provide emergency response (Sweetwater County 2016).

Uinta County, Wyoming

Uinta County is serviced by two law enforcement agencies, including the Uinta County Sheriff's Department and the Evanston Police Department. The county is serviced by the emergency response and fire suppression efforts of the Uinta County Fire District. In addition, Uinta County formed the Uinta County Emergency Management Agency to promote emergency preparedness in the event of natural or manmade disaster (Uinta County 2016).

2.9.2 Uniform Crime Rates

The Ashley National Forest socioeconomic planning area is served by numerous law enforcement agencies. The agencies located in Utah include:

- Daggett County Sheriff's Office
- Uintah County Sheriff's Department
- Naples Police Department
- Vernal Police Department
- Duchesne County Sheriff's Department
- Myton Police Department
- Roosevelt Police Department

In addition, the Sweetwater County Sheriff's Department, Uinta County Sheriff's Department and Evanston Police Department serve the socioeconomic planning area in Wyoming (Utah Department of Public Safety 2015; Wyoming Division of Criminal Investigation 2015).

Crime rates can provide information about social conditions in an area. Crime rates may be influenced by influxes in population, as is often seen in boom cycles of development of natural resources. Uniform Crime Rates are reported by law enforcement agencies to the FBI. Uniform Crime Rates include instances of personal and property crimes, both violent and nonviolent offenses. Personal crimes include instances of homicide, forcible rape, robbery, and aggravated assault. Property crimes include burglary, larceny, motor vehicle theft, and arson. See **Table 2-12**, Uniform Crime Rates, below, for reported crimes by all law enforcement agencies within each of the five socioeconomic planning area counties for 2015. Crime rates are very low in the socioeconomic planning area, with larceny (non-motor vehicle theft) being the most reported crime. One murder was reported in 2015 in the socioeconomic planning area, in Duchesne County.

Table 2-12
Uniform Crime Rates

	Number of Incidents								
	Homicide	**Rape**	**Robbery**	**Aggravated Assault**	**Burglary**	**Larceny**	**Motor Vehicle Theft**	**Arson**	**Totals**
Utah Counties									
Daggett	0	1	0	0	2	7	1	11	22
Duchesne	1	20	3	45	137	476	77	2	761
Uintah	0	18	3	47	102	610	38	3	821
Wyoming Counties									
Sweetwater	0	50	4	120	115	569	47	*not reported	905
Uinta	0	2	0	1	2	78	8	*not reported	91

Sources: Utah Department of Public Safety 2015; Wyoming Department of Criminal Investigation 2015

2.10 COMMUNITIES OF PLACE

The local economy, historically based on agriculture and solid minerals mining, has diversified. Along with oil and natural gas, now other forms of energy extraction and tourism are major industries associated with the Ashley National Forest. Nevertheless, agriculture remains important.

In general, the planning area is a rural setting. Rural areas are more commonly associated with natural amenities (such as National Forest System lands) that attract retirees and other migrants. This is in contrast to urban areas, which tend to be associated with higher incomes, greater employment opportunities, and higher levels of education attainment. According to National Agricultural Statistical Service data, there is very little urban land in the four main counties within the socioeconomic planning area. Daggett and Duchesne Counties have zero land considered urban, Uintah County has 1,731 acres of urban area, and

Sweetwater County has 988 acres of urban area, which is less than 1 percent of the land in each county (National Agricultural Statistical Service 2006).

Communities adjacent to the Ashley National Forest provide support services for activities on the Ashley National Forest, such as emergency services and housing for Forest service employees. In addition, multiple employment sectors are directly or indirectly supported by Ashley National Forest activities. These sectors include recreation, timber product harvest, and energy and minerals development. The services have economic ties to Ashley National Forest extractive and non-extractive resources. Key communities adjacent to the Ashley National Forest are:

- Vernal City (Uintah County, Utah)
- Roosevelt (Duchesne County, Utah)
- Duchesne (Duchesne County, Utah)
- Manila (Daggett County, Utah)
- Dutch John (Daggett County, Utah)
- Green River (Sweetwater County, Wyoming)
- Rock Springs (Sweetwater County, Wyoming)

Table 2-2, Population in the Socioeconomic Planning Area (1990-2015), shows the population of these communities. These are communities with traditional lifestyles that value natural resources for both market and nonmarket contributions (Russell 2008). The communities are small and far from major city centers; Duchesne is the closest to a major city, more than 100 miles from Salt Lake City.

Vernal, Roosevelt, and Duchesne are within the Uintah Basin, Utah. The Uintah Basin's economy has historically been tied to ranching, farming, mining, and logging (Russell 2008). These are still important economic drivers of the region, in addition to energy development. Due in part to energy sector jobs, Duchesne County was the second-fastest growing rural county in America in 2013, and Vernal was the sixth-fastest growing micropolitan area[1] in the nation (Utah Energy 2016).

Manila and Dutch John are in Daggett County, Utah. Daggett County is rural, with few commercial establishments. Most of these establishments are there to support recreation on federal lands; 83 percent of the county is under federal ownership by the Forest Service or BLM (Daggett County 2016). In addition to tourism, ranching is an important economic activity in Daggett County.

[1]As defined by the Office of Management and Budget, micropolitan areas are labor market areas in the U.S. centered on an urban cluster (urban area) with a population at least 10,000 but fewer than 50,000.

Green River and Rock Springs are the largest cities in Sweetwater County, Wyoming - the largest county in Wyoming. Oil and gas development, trona and coal mining provide the economic foundation for the county. In 2015, these industries employed 5,642 persons and provided 23 percent of all employment and 39 percent of all wages in Sweetwater County (U.S. Census Bureau 2015). Other important economic sectors include manufacturing, transportation and warehousing, wholesale and retail trade, government, agriculture, and tourism.

The Flaming Gorge region provides an important destination for many tourists, including hunters and anglers. According to a recent report for the Wyoming Office of Tourism, travel and tourism spending contributed $167.4 million to the Sweetwater County economy in 2015. (Dean Runyan Associates 2016). In a corresponding study completed by the University of Wyoming, hunters and anglers spent more than $14.2 million in Sweetwater County in 2015 (Taylor and Foulke 2016).

2.11 COMMUNITIES OF INTEREST

In addition to their physical place, communities can be defined by their connections to the local landscape (Patterson et al. 2003). These groups are defined as "communities of interest" and provide a means of examining connections between communities and ecosystem services that transcend geography. Key values and concerns for these groups are identified below.

- Local residents
  - Local residents include individuals that live adjacent to the Forest and in the surrounding communities. To local residents, the Forest is a source for municipal water, recreational activities, employment, and an economic driver for tourism. Local residents would be concerned with management decisions that could affect recreational opportunities, access, traffic, the local economy, and the fire regime.
- Local governments
  - Local governments would likely be concerned with management decisions that could impact the local economy, or attract or deter new residents. Payments in Lieu of Funds and other tax funds directly tied with federal lands would also be an issue of importance to this group.
- Conservation-minded individuals/groups
  - Conservation-minded individuals or groups would likely want to preserve the natural setting of the Ashley National Forest. This group's concerns would include management decisions that might impact recreational opportunities, visual resources, wildlife, and vegetation. These individuals

may include those who actively use the Ashley National Forest and those interested in the non-use values of the Ashley National Forest (see discussion under **Section 3.3.2**, Cultural Ecosystem Services). The percentage of Utah survey respondents expressing support for a major increase in wildlife habitat protection was highest in Wasatch County (36.7 percent) and was lowest in the Daggett, Duchesne, and Uintah Counties area (15 percent) (Krannich 2008).

- Education/research stakeholders
  - People that use the Ashley National Forest for education or research purposes would likely want to preserve the natural setting of the Ashley National Forest. The ability to access areas for study and the funding for cooperative education programs would also be of interest.
- Recreational users
  - Recreational visitors to the socioeconomic planning area include both local residents and destination visitors from communities outside the socioeconomic planning area. Many recreationists come from the Wasatch Front, which is the largest population center nearby. This user group includes picnickers, anglers, mountain bikers, road cyclers, off-highway vehicle (OHV) users, hunters, hikers, backpackers, campers, horseback riders, and wildlife watchers. Recreational users would be concerned with management decisions that could impact recreational opportunities within and access to the Ashley National Forest.
- Forest product-focused stakeholders
  - Ashley National Forest product-focused stakeholders make earnings off of commercial timber harvesting. In addition, area residents may use forest and woodland products for fuelwood. This community group would be interested in decisions that impact the ability to access this resource and the level of products harvested. Surveys of Daggett, Duchesne, and Uintah County residents indicated that approximately 44 percent of respondents favored maintaining timber harvesting on public lands at or near current levels (Krannich 2008).
- Mineral development-focused stakeholders
  - The Ashley National Forest contains mineral resources with potential for development. Stakeholders with an interest in development would be concerned with decisions that

impact the areas available for leasing and development, or decisions that otherwise impact the timing and ability to access and develop these resources. Surveys of Daggett, Duchesne, and Uintah County residents indicated that approximately 41 percent of respondents favored maintaining mineral development on public lands at or near current levels (Krannich 2008).

- Livestock grazing-focused stakeholders
  - Ranching and agriculture are a part of the area's history, culture, and economy. Some of the permits have been held by the same families for decades. Ranchers face such challenges as fluctuating livestock prices, increasing equipment and operating costs, and changing federal regulations. Ranchers and farmers would likely desire to maintain their traditional lifestyle and would be interested in management decisions that might change this, such as the availability of land for livestock foraging. Because there is limited private land and a lot of public land, people in ranching depend on access to the Ashley National Forest for grazing (Russell 2008).
- Subsistence users/traditional cultural users, including tribal groups
  - The Ute Tribe would be traditional cultural users in the area; some could be subsistence users. This community would be concerned with management decisions that could change their access, gathering activities (e.g., teepee poles, traditional plants, food), and cultural uses.
- Low-income or minority populations
  - Low-income or minority populations could be affected by forest management decisions, depending on the type of management that occurs in relation to where those populations reside. Although the socioeconomic planning area as a whole contains fewer low income or minority individuals than the state average, there may be communities with high minority or low income populations, or small groups such as Native Americans or migrant workers who rely on the national forest for items like game or fuelwood.

This page intentionally left blank.

CHAPTER 3
ASHLEY NATIONAL FOREST CONTRIBUTIONS TO SOCIAL, CULTURAL, AND ECONOMIC CONDITIONS

Per the requirements outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessments, Section 13(1)(d), information is provided below for Forest operations, management, and resource use contributions to social, cultural, and economic conditions.

3.1 OVERVIEW OF LAND AREA

The Ashley National Forest totals approximately 1,400,000 administrative acres, which are divided into administrative ranger districts. These districts include Flaming Gorge (354,000 acres), Vernal (341,000 acres), and Duchesne/Roosevelt (705,000 acres).

3.1.1 Acres by Landownership Status

Landownership and land status influence management decisions regarding resource use and access. Approximately 22,800 acres of private inholdings exist within the Ashley National Forest boundary. Most of these inholdings originated as mining claims or homesteads. The Flaming Gorge Ranger District has 12,500 acres (55 percent) of inholdings, the Vernal Ranger District has 7,300 acres of inholdings (32 percent), and the Duchesne-Roosevelt Ranger District has 3,000 acres of inholdings (13 percent). For more information, refer to the Lands Specialist Report (Forest Service 2017b).

3.1.2 Overview of Use and Access Patterns

Both land use and access are important aspects of the complete socioeconomic snapshot of the Ashley National Forest. Special-use authorizations for various Ashley National Forest land uses are processed and administered by the Ashley. Lands special-use authorizations range from:

- roads
- power lines
- canals
- pipelines
- utility corridors (including power)
- oil and gas
- fiber optic cables
- cellular

Lands special-use authorizations, particularly those issued for utilities, are congregated in the western portion of the Ashley National Forest. At present, 146 lands special-use authorizations are issued on the Ashley National Forest. For more information, refer to the Lands Specialist Report (Forest Service 2017b). Recreation special-use authorizations are also administered by the Ashley National Forest. These include recreational residences, outfitter and guide services, concessionaires, and temporary events. There are currently 96 recreation special-use authorizations issued on the Ashley National Forest, based on the Lands Specialist Report. Both lands and recreation special-use authorizations are growing in demand on the Ashley National Forest, particularly for utilities authorizations.

Access to the Ashley National Forest is via numerous primary and secondary roads. These roads include Utah and Wyoming State Highways, County roads, tribal roads, and Ashley National Forest system roads. U.S. Highway 191 and State Highway 44 create a scenic byway that intersects both the Vernal and Flaming Gorge Ranger Districts. This section of Highway 191 in Duchesne County is part of the Dinosaur Diamond Scenic Byway. It is also state designated as the Indian Canyon Scenic Byway. This main scenic byway provides access to Ashley National Forest System roads and trails. County roads and tribal roads provide access to the canyons along the south slope of the Uinta Mountains, within the Vernal and Duchesne-Roosevelt Ranger Districts. The southern portion of the Duchesne-Roosevelt District is accessed via Highway 191 or numerous tribal and county roads.

Issues concerning access to the Ashley National Forest can occur when access to the Ashley is limited through Ashley fragmentation between private inholdings and Ashley National Forest lands. Private landowners have full discretion to allow or disallow travel easements and Ashley National Forest access across their lands. To bypass access restrictions and route limitations, illegally established non-system routes exist throughout the Ashley National Forest. These illegal non-system routes may cause resource damage that can far outweigh any of the benefits of increased access.

3.1.3 Important Cultural or Tribal Use Areas

The Ashley National Forest is part of the ancestral home of the Ute peoples and borders the periphery of the Eastern Shoshone traditional tribal lands before current reservation boundaries. Their traditional uses of the area in and surrounding the Ashley National Forest include:

- grazing
- hunting
- fishing
- cultural and subsistence gathering of food and other plants
- visiting sacred sites
- other uses

Tribal access to the Ashley National Forest is maintained via numerous tribal roads. The entire Duchesne-Roosevelt Ranger District is within the bounds of the original Uintah Valley Indian Reservation and is considered culturally significant.

The following specific sites were named in collaboration with Clifford Duncan, a Ute Tribal Elder with the Cultural Rights and Protection Office, as especially culturally significant:

- Paint Mine-Moon Lake
- confluence of Rock Creek and Duchesne River
- Rock Creek area
- McAfee Basin
- Mouth of Whiterocks Canyon
- Uinta Canyon
- Willow Creek
- Pine Springs in Wyoming
- Red Cloud loop above Brownie Canyon
- a ceremonial area near Elkhorn Ranger Station

For additional information, refer to the Tribal Specialist Report (Forest Service 2017c).

As expressed in the Russell 2008 study, tribal members would like to see an increased use of natural resources for indigenous peoples on the Ashley National Forest. The Ute Tribe Cultural Rights and Protection Office indicates that the Ashley National Forest does not formally recognize that there is a difference between the general public's use of Ashley products and tribal treaty

rights that allow tribal members to access and collect traditional plants and resources. Specifically, increased gathering, timber harvesting, and other uses (including increased collaboration between the Forest Service and Tribal Council) are sought by tribal members throughout the entire territory of the Ashley National Forest.

3.2 OVERVIEW OF MARKET CONTRIBUTIONS

The Ashley National Forest contributes economically to the surrounding region. The contributions are both directly through Forest Service employment, commodity revenues, and tax subsidies - and indirectly through resource development, tourism, and recreational spending. The economic impact analysis area is comprised of Daggett, Duchesne, Uintah, and Sweetwater counties, which represent the functional economy for people living and working around the planning area. Although some effects may occur outside of this area, the majority of the effects will likely occur within the four counties, which contain almost the entire planning area. Quantitative contributions to the local economy below are estimated using this economic analysis area. A summary of contributions is provided in **Table 3-1**, Estimated Annual Employment and Labor Income Contributions from the Ashley National Forest by Resource Program, 2014, and in the text below.

Table 3-1
Estimated Annual Employment and Labor Income Contributions from the Ashley National Forest by Resource Program, 2014

Ashley National Forest Contribution	Employment (full and part time jobs)	Labor Income (thousands of 2014 dollars)
Recreation	26	$802*
Wildlife and Fish Recreation	34	$1,141
Grazing	126-129	$2,748-$2,812
Timber	12	$839
Minerals	40	$5,019
Payments to State/Counties	63	$2,873
Forest Service Expenditures	283	$11,715

* Employment and labor Income data for Recreation and Wildlife and Fish Recreation includes non-local visitor spending only.
Source: Minnesota IMPLAN Group 2014

3.2.1 Direct Employment by the Forest Service

Direct employment represents a relatively minor contribution to the area economy; in 2014, the Ashley National Forest directly employed 257 people. This employment accounts for only 2.7 percent of the 9,656 total government jobs in the socioeconomic planning area.

3.2.2 Revenue Sharing with Local Governments

PILT are annual federal payments made to local governments to offset property tax revenue losses from nontaxable federal lands held within their boundaries.

PILTs are meant to subsidize taxes that would otherwise fund government services such as schools, road improvements, and fire suppression. PILTs are in addition to federal royalties paid for oil, gas, and mineral leasing. PILTs awarded to Uintah and Sweetwater Counties exceeded $3 million each in 2015. Duchesne County received nearly $2.5 million in PILT, and Daggett County received less than $500,000 in PILT in 2015 (U.S. Department of the Interior 2016). PILT values reported are for all federal lands and mineral resources within the county. Information is not included for Uinta County, Wyoming, due to a lack of Ashley National Forest lands in that County.

In addition to PILTs, counties received funds from the Secure Rural Schools and Community Self-Determination (SRS) Act of 2000. SRS was enacted to assist rural counties that have been negatively affected by the decline in revenue from timber harvesting on federal lands. SRS funds are used to finance roads and schools (Forest Service 2015). Total SRS payments to socioeconomic planning area counties were approximately $1 million in 2014 for the four main counties in the socioeconomic planning area (Forest Service 2016a).

Revenue sharing payments (PILT and SRS funds) account for 63 jobs and $2.87 million of labor income to the local area economies, based on IMPLAN modeling.

3.2.3 Mineral and Energy Development

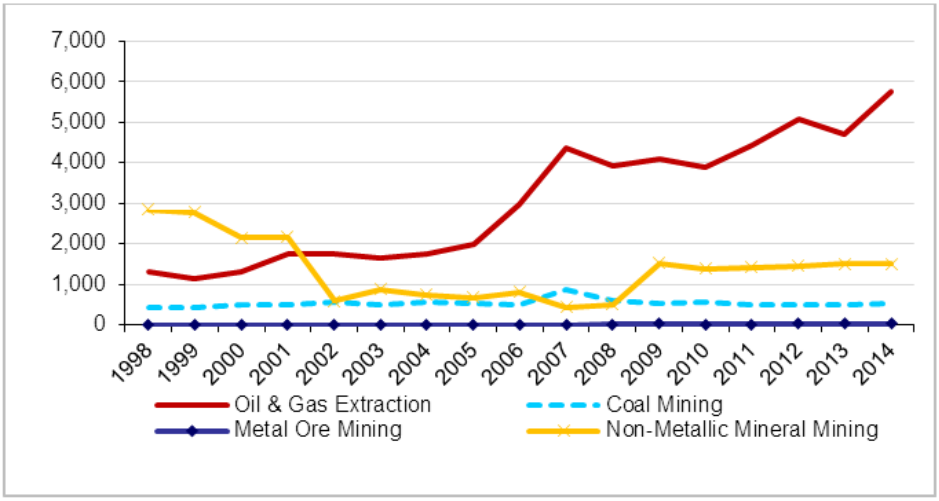
Mineral extraction includes mining for saleable minerals, including crushed stone, dimension stone, specialty minerals, as well as oil and gas extraction. In 2014, the 160 oil wells on the Ashley National Forest produced approximately 316,000 barrels of crude oil per year, along with 58,000 barrels of natural gas liquids (condensate) and 1,500,000 million cubic feet (MMCF) of natural gas (see the Energy and Minerals Specialist Report, Forest Service 2017d). Economic modeling indicates that, during the same year, mineral extraction on the Ashley National Forest provided 40 jobs and more than $5 million in labor income to the region's economy (Minnesota IMPLAN Group 2014).

Beginning in the early 2000s, the price of crude oil began rising rapidly. In January 2000, the spot price of a barrel of crude oil was $27.26. In June 2008, it was $133.88. Oil prices fell steeply in 2009, to a low of $39.09, before climbing and maintaining prices around $100 dollars a barrel through June 2014. In June 2014, oil prices once again fell and have remained below $50 a barrel from December 2014 through November 2016 (U.S. Energy Information Administration 2016). The drop in prices is the result of oil supply outpacing demand. In 2014, Utah ranked 11th in the nation for crude oil production, and Wyoming ranked 8th (Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016a). In 2013, Wyoming ranked 5th and Utah ranked 10th, in gross natural gas production (Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016a).

In late 2016, the price of crude oil began to rebound, and Wyoming has already seen evidence of increased exploration (Wyoming Department of Administration and Information, Economic Analysis Division 2016). However, oil and gas employment in Wyoming remained unchanged from October through December 2016 (Wyoming State Government 2017).

The data below summarize some of the economic trends occurring in the planning area. However, the economic implications of the oil and gas industry are a global issue, and a thorough discussion is outside the scope of this document. **Figure 3-1**, Jobs in Different Mining Sectors within the Forest Socioeconomic Planning Area, shows the rapid rise in oil and gas extraction employment in the socioeconomic planning area beginning in 2005. These data are derived from the U.S. Census Bureau's County Business Pattern data sets, which are only available through 2014.

Figure 3-1
Jobs in Different Mining Sectors within the Forest Socioeconomic Planning Area



Source: U.S. Census Bureau 2016b

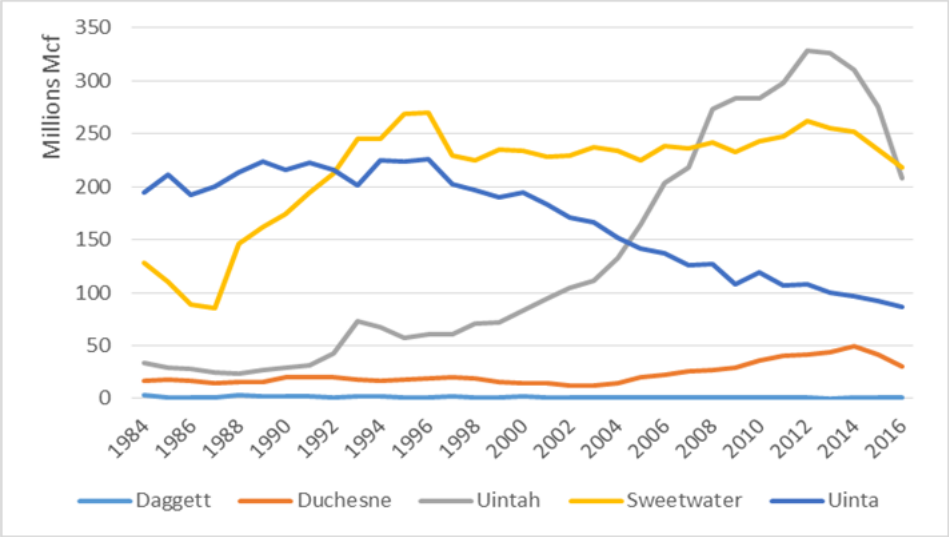
At the county level in Utah, Duchesne County was the number one and Uintah County number two in oil production by county, according to Utah Department of Natural Resources, Division of Oil, Gas, and Mining (2016a) data. For natural gas, Uintah County was the number one natural gas-producing county, and Duchesne County was number three (Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016a).

Trends in oil production for the socioeconomic planning area counties are shown in **Figures 3-2** and **3-3**, below.

Trends can also be reflected in the number of new wells drilled (**Table 3-2**, New Wells (Oil and Gas)) and the amount of new applications for permits to drill (**Table 3-3**, Applications for Permits to Drill) in the four counties in the socioeconomic planning area where energy development is occurring. These

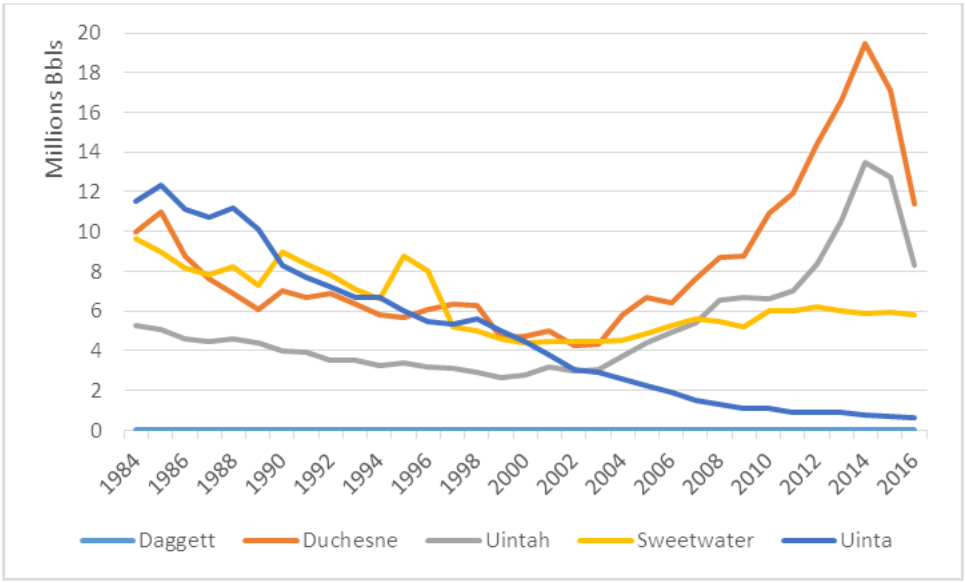
data include all development in the counties and are not limited to the Ashley National Forest. In total, the Ashley National Forest contains 160 active oil and gas wells.

Figure 3-2
Annual Gas Production (MMCF), 1984-2016



Source: Wyoming Oil and Gas Conservation Commission 2017; Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016a

Figure 3-3
Annual Oil Production (MBBLS), 1984-2016



Source: Wyoming Oil and Gas Conservation Commission 2017; Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016a

Table 3-2
New Wells (Oil and Gas)

County	2012	2013	2014	2015	Sept. 2016
Daggett	0	1	0	0	0
Duchesne	420	442	433	37	18
Uintah	632	527	411	105	22
Sweetwater	160	141	72	34	22

Source: Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016b

Table 3-3
Applications for Permits to Drill

County	2012	2013	2014	2015	Sept. 2016
Daggett	0	0	0	0	0
Duchesne	745	794	511	77	41
Uintah	1213	737	798	451	143
Sweetwater	No Data	93	227	129	96

Source: Utah Department of Natural Resources, Division of Oil, Gas, and Mining 2016b

Oil and gas production provided a large amount of tax revenue, jobs, and increased overall economic activity to the socioeconomic planning area. Development of Ashley National Forest minerals represents only 0.2 percent of mining-related employment and 0.3 percent of mining-related income in the socioeconomic planning area (Minnesota IMPLAN Group 2014). In addition, economic impacts have decreased with the downturn in oil prices. Duchesne County reported a 33 percent reduction in mining jobs from March 2015 to March 2016, and Uintah County reported a 20 percent reduction (Utah Department of Workforce Services 2016a).

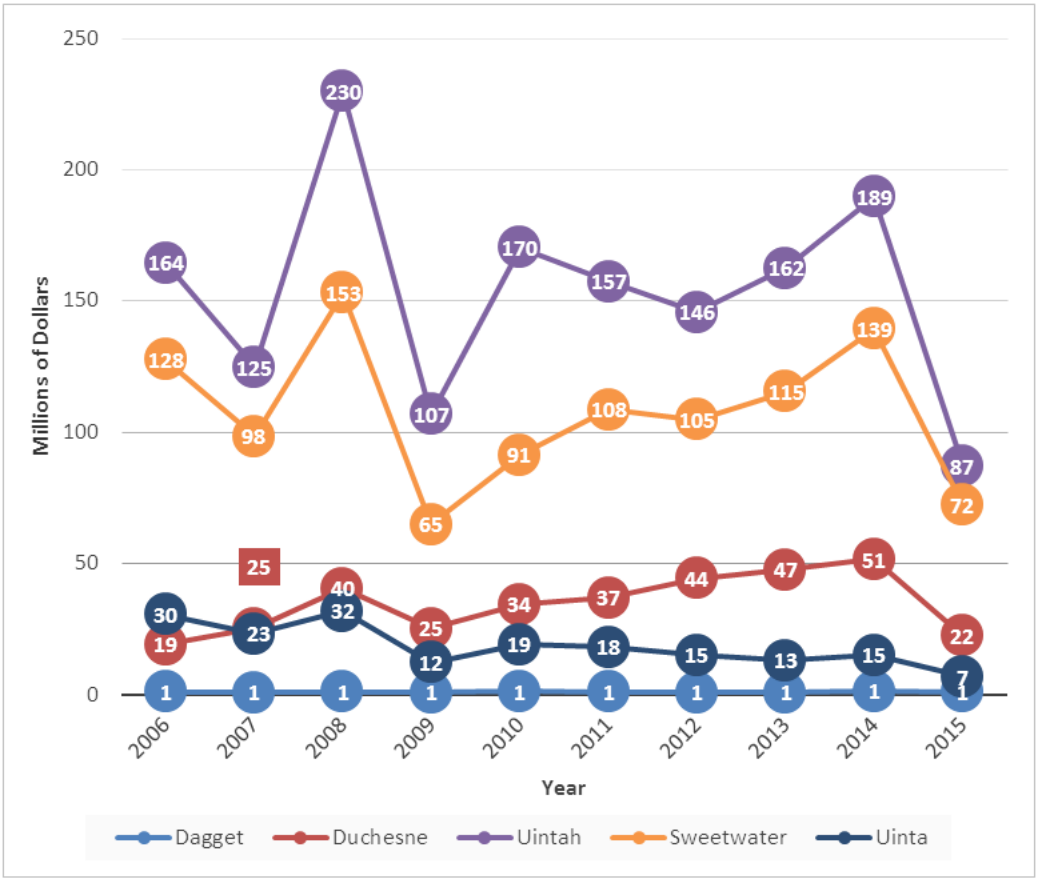
The reduction in the industry has had cumulative effects. In addition to an increase in unemployment in the mining sector, the economic downturn was felt throughout several industries, such as construction and transportation. More broadly, almost all industry sectors experienced declines. As previously discussed, Daggett County does not have large employment in the mining industry and has not felt the impacts of the downturn like Uintah and Duchesne Counties. Since 2014, Daggett County has experienced slight growth in its tourism sectors (Utah Department of Workforce Services 2016b).

Wyoming felt similar declines. From 2014 to 2015, employment in the mining sector fell 13.3 percent, construction fell 3.1 percent, and transportation, utilities and warehousing fell 1.7 percent (Wyoming Department of Workforce Services 2016). From the third quarter of 2015 to the third quarter of 2016, the Wyoming mining industry contracted another 21 percent, construction fell five percent, and transportation fell 8.6 percent (Wyoming Department of Workforce Services 2016). Sweetwater County's production has shown the

steadiest historical production in both oil and gas, while Uinta County has seen declines in production - despite the dramatic increase in oil and gas drilling.

Figure 3-4 shows the rents, royalties, bonuses and bids paid to counties for oil and gas production on federal lands from 2006 to 2015. The numbers represent all federal minerals and are not all attributed to the Ashley National Forest. In 2008, revenue peaked at $423 million; Uintah County alone accounted for more than half of the federal revenue ($230 million). In 2015, revenue for the socioeconomic planning area was $367 million. Uintah County alone accounted for nearly $200 million. Between fiscal year 2014 and fiscal year 2015, county revenues fell by an average of 42 percent for Daggett, Duchesne, Sweetwater, and Uintah Counties.

Figure 3-4
Rents, Royalties, Bonuses, and Bids in the Socioeconomic Planning Area



Source: U.S. Department of the Interior 2015

The decline in revenue shown here is only a small portion of the total tax revenue decline of the oil and gas industries. This is because each county will also have additional revenue from oil and gas leases on tribal, state, and private lands. Additionally, there is a secondary decline in state and county revenue, such as a decline in sales tax in the retail and lodging sector, as well as in the

sale of mining equipment (Wyoming Department of Administration and Information, Economic Analysis Division 2016).

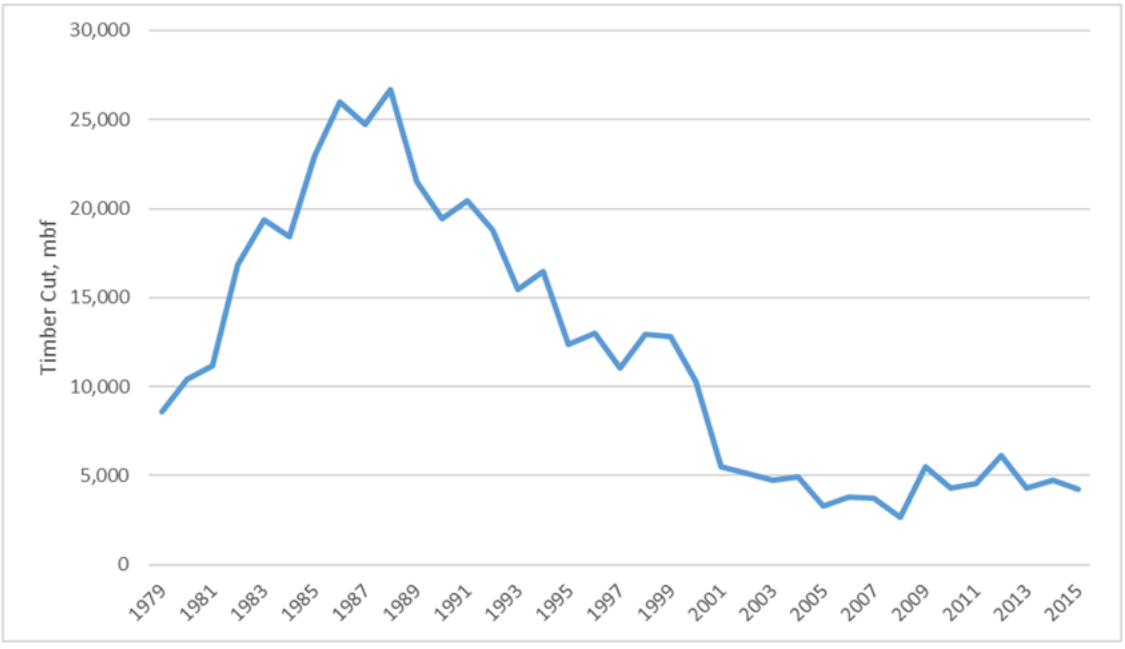
3.2.4 Timber Resources

Figure 3-5, Timber Volume (mbf) in Ashley National Forest, 1979-2015, represents the volume of timber harvested from the Ashley from 1979 to 2015. Timber harvesting peaked in the late 1980s at approximately 27,000 mbf and has averaged between 4,000 and 6,000 mbf since 2001.

Utah's commercial timber harvest in 2012 was 19.4 million board feet (MMBF), 52 percent of which was harvested from National Forests (Forest Service 2016b). The Ashley National Forest supplied 1,904 mbf in 2012, which is approximately 16 percent of the National Forest timber harvested in Utah (Forest Service 2016b). Uintah County had the second-largest timber harvest of all counties in Utah in 2012. No suitable timber stands on the Ashley National Forest are in Wyoming.

Based on economic modeling of 2014 data, the Ashley National Forest timber harvesting program contributed 12 jobs and $839,000 in labor income to the region's economy (Minnesota IMPLAN Group 2014). Labor income estimates include saw timber and removal of poles, posts, and fuelwood.

Figure 3-5
Timber Volume (mbf) in Ashley National Forest, 1979-2015



Source: Forest Service 2016c

3.2.5 Livestock Grazing

Agriculture plays an important economic and social role in some parts of the socioeconomic planning area. The Utah counties- Daggett, Duchesne, and

Uintah- ranked 29th (last), 6th, and 10th in cattle production according to the 2012 Census of Agriculture. Of Wyoming's 23 counties, Sweetwater ranks 21st and Uinta ranks 18th in cattle production (National Agricultural Statistical Service 2012).

Current permitted use of grazing on the Ashley National Forest is 45,873 head months (HMs) (approximately 59,360 animal unit months, AUMs) cattle and horse, and 41,417 HM (approximately 11,366 AUMs) sheep and goats. Additionally, there are 7,744 permitted AUMs on BLM-administered portions of the Ashley National Forest (Forest Service 2016d). These allotments are in Wyoming and are not separated by cattle and sheep. Actual or authorized use varies annually, based on precipitation levels, vegetation conditions, and other factors. In 2015, authorized use was estimated at 39,735 HM (approximately 51,666 AUM) cattle and horses and 12,056 HM (approximately 3,331 AUM) sheep and goats. These 2015 numbers do not include the 7,744 AUMs on BLM-administered portions of the Ashley National Forest. See **Section 4.3.2** for additional information on current and historic use.

If all permitted HMs were grazed, it would support 162 jobs and $3.5 million in labor income annually. Based on actual use in 2016, up to 127 jobs and $2.8 million in labor income in Daggett, Duchesne, Uintah, and Sweetwater Counties would be directly or indirectly supported by grazing on the Ashley National Forest (Minnesota IMPLAN Group 2014).

There are 92 grazing permittees on the Ashley National Forest; most are in Duchesne (44.6 percent) and Uintah (32.6 percent) Counties. Sweetwater County holds 5.6 percent of grazing permits. Daggett County has only three permittees. There are 39 permittees on the BLM-administered Ashley National Forest grazing allotments in Wyoming.

3.2.6 Tourism and Recreation

The predominant recreation activities on the Ashley National Forest, based on visitor use surveys, are:

- fishing
- viewing natural features
- hunting
- driving for pleasure
- relaxing
- using motorized trails
- hiking and walking
- camping
- viewing wildlife

(Forest Service 2012; see **Section 4.1.2**, Current Levels and Type of Use, and Recreation Specialist Report, Forest Service 2017e for additional details). Local day-use visitors, from Duchesne, Sweetwater, and Uintah Counties, make up the largest proportion of visitors (108,579, or 37 percent).

The Ashley National Forest is on the primary corridor between Yellowstone and Grand Teton National Parks in northwestern Wyoming, Arches and Canyonlands National Parks in southern Utah, and Rocky Mountain National Park in north central Colorado - attracting tourists along this route. Nonlocal overnight visitors totaled 72,566 (25 percent), and nonlocal day visitors totaled 32,272 (11 percent; Forest Service 2012).

A national forest visit is defined by the National Visitor Use Monitoring Survey as the entry of one person to participate in recreational activities for an unspecified period of time. The National Visitor Use Monitoring Survey estimated 294,565 visits to the Ashley National Forest in 2012. The average group size was 2.8 persons (Forest Service 2012). A National Forest visit can be composed of multiple site visits, as visitors go to different sites on the Forest. These site visits are broken down into day-use developed site visits, overnight use developed site visits, general Forest area visits, and designated wilderness visits, as seen in **Table 3-4**, National Forest Site Visits.

Table 3-4
National Forest Site Visits

Type of Visit	Number of Site Visits
Day-use Developed Site Visits	172,000
Overnight Use Developed Site Visits	82,000
General Forest Area Visits	380,000
Designated Wilderness Visits	20,000
Total Estimated Site Visits	654,000

Source: Forest Service 2012

In 2009, the average expenditure per party per trip to National Forests ranged from $33 by local day visitors to $514 by nonlocal overnight visitors. The single biggest expense for day visitors was gasoline, followed by food. For nonlocal overnight visitors, the largest expenditure was lodging, followed by food and then gas (Forest Service 2012).

Recreation on the Forest by nonresidents provides an estimated 60 jobs. In 2014, it accounted for $1.94 million in labor income to the region's economy (Minnesota IMPLAN Group 2014). This estimate was made using National Visitor Use Monitoring Program spending profiles for nonresident visitors, which are based on reported visitor spending within 50 miles of the interview site.

Providing recreational activities to local residents surrounding the Forest is an important contribution. However, their expenditures do not represent new

money in the local economy. If local residents do not spend money visiting the Forest, they would likely find other local recreational activities in which to participate. Since local recreation spending is not new economic activity, recreation job totals above only include jobs and income created by nonlocal spending.

Recreation of particular interest occurring on the Ashley National Forest takes place on the Green River and the Flaming Gorge Reservoir. Popular activities include floating, rafting, and fly-fishing on the Green River and motorized water-based recreation on the Flaming Gorge Reservoir. These activities have created a thriving economic community of outfitters and guides in the northeastern portion of the Ashley National Forest along the Utah-Wyoming border. This area is in Daggett County, in and around Dutch John and Red Canyon, Utah.

These activities have seen significant growth in the last five years, based on the number of shuttles and number of launches by private companies supporting the Ashley National Forest visitors. Shuttles support fishing, floating, and rafting on the Green River by picking up and dropping off individuals at specific points, often with the option of experienced guides. Launches capture the number of boat launches to access the Flaming Gorge.

Table 3-5, Launches and Shuttles to the Green River and Flaming Gorge by Local Outfitters and Guides, provides the total number of each of these activities and the annual growth rate. From 2011 to 2015, the number of launches grew 125 percent, and the number of shuttles grew 36 percent. As a whole, this activity is captured in the 2012 National Visitor Use Monitoring Program visitor number data that are used to complete the IMPLAN economic and market analysis for recreational use. However, the analysis cannot provide specific market valuations related to these two specific recreational activities. Additionally, much of the growth has taken place after the most recent National Visitor Use Monitoring survey. While exact market valuations are not possible, it is clearly a growing and important industry for visitors and private outfitters alike.

Table 3-5
Launches and Shuttles to the Green River and Flaming Gorge by Local Outfitters and Guides

Year	Launches	Yearly Growth	Shuttles	Yearly Growth
2011	1,880	-	3,605	-
2012	3,166	68%	3,752	4%
2013	2,820	-11%	4,153	11%
2014	3,879	38%	4,497	8%
2015	4,215	9%	4,886	9%

Source: Forest Service 2016e

3.3 OVERVIEW OF ECOSYSTEM SERVICE CONTRIBUTIONS

Per the requirements outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessments, Section 13.12, Ecosystem Services, information is provided below for Ashley National Forest contributions to ecosystem services.

The concept of ecosystem services has emerged as a way of framing and describing the comprehensive set of benefits that people receive from nature. Ecosystem processes are the complex physical and biological cycles and interactions that underlie what is observed as the natural world. Ecosystem services are the specific results of those processes that either directly sustain or enhance human life or maintain the quality of ecosystem goods (as water purification maintains the quality of streamflow; Brown et al. 2007; Costanza et al. 1997; Daily et al. 1997; Kline 2006).

Ecosystem services can include items measured in the traditional economic market (or market contributions, as discussed in **Section 3.2**, Overview of Market Conditions), as well as those not directly relatable to dollars spent or received, which contribute to improving the quality of life for area communities (nonmarket contributions). The degree to which any given ecosystem service is a benefit depends on: the combined influences of stakeholders' preferences for the ecosystem service, its scarcity and accessibility to the public, and how many people value it, among other factors.

These services are described below are based on the Millennium Ecosystem Assessment classification system (Millennium Ecosystem Assessment 2005). This system developed a frequently referenced classification of ecosystem services into the four categories of provisioning, supporting, regulating, and cultural services. The condition and trend of these ecosystem services are dependent on the underlying resources that support them. Therefore, the information for this assessment relies on the specific resource assessments that were conducted in other sections of this report and in other specialist reports. Thus, ecosystem services are described below, with a reference to other reports containing information on conditions, trends, and stressors.

Key ecosystem services for the Ashley National Forest are those services important in the broader landscape and likely to be influenced by the land management plan. Identification of key ecosystem services will assist development of plan components and tradeoffs to ecosystem services beneficiaries, in the next stage of the planning process.

3.3.1 Provisioning Services

Provisioning services are broadly described as products derived from ecosystems. These products can include a broad spectrum of products from raw materials, minerals and energy products, water, and medicinal resources. On the Ashley National Forest, the key provisioning services are those products discussed in detail in **Section 3.2**, Overview of Market Contributions, including

wood products, minerals and energy products (oil and gas), forage for livestock and animal products from hunting and fishing. Harvest and extraction of these resources - and maintenance of the habitat to support long-term use of these resources - contribute to food sources, recreation, jobs, and spending of tourism dollars in the local area. These contributions represent not only direct economic contributions, but support for maintained social and cultural values in the socioeconomic planning area. Details of the monetary value of these resources are discussed under **Section 3.2**, and the interrelations of these products with long-term sustainability of the resources are discussed in **Chapter 4**, Multiple Use.

Forest land contributes to the livelihoods of area residents through subsistence uses, as well as through market-based production and income generation. Public lands provide products of value to households at no or low cost (permit fees). Subsistence uses are fuelwood, boughs and Christmas trees, and additional products, such as fish, game, plants, berries, and seeds. Use of these products is often part of tradition and sustains local culture.

Krannich (2008) found that Daggett, Duchesne, and Uintah Counties have a high level of participation in non-commodity materials and resources collected from public lands. Nearly 26 percent of survey respondents in the study cut firewood for home use on public lands, 30 percent cut Christmas trees, and 32 percent gather rocks for home landscaping. Additionally, pinyon nut gathering, fossil collecting, and wild berry and herb collecting for food are popular activities.

Market-based products may be more closely associated with income and economic livelihood. These types of activities are often considered a way of life and are associated with long-run family traditions and sense of place. Market-based commodities are saw timber, livestock forage for livestock, minerals, and such materials as sand and gravel.

3.3.2 Cultural Services

Cultural services are defined as benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences, and cultural heritage values. Cultural services are defined as benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences. These can include cultural significance (e.g., use in books and paintings), spiritual and historical use (e.g., sites with religious or historical importance), recreational experiences, and educational or scientific importance (e.g., sites used for education or scientific study). Contemporary uses of resources and places within the planning area by American Indian and Anglo-American traditional communities are critical to maintaining the cultural identity of these communities. These heritage values are a source of pride and contribute to a sense of community and individual identity. Communities that depend on access to and resource condition of resources on the Ashley National Forest are

affiliated tribes, locals, recreationists, the general public, and others interested in historic land grants.

The key cultural services on the Ashley National Forest are aesthetic values, cultural heritage values, and recreation. Agriculture, including livestock grazing, represents an activity with cultural ties to the planning area. Livestock grazing contributions to cultural services through preservation of open space and pastoral scenery, as well as by preserving traditional ways of life. Landscapes, wildlife, and other features provide scenic resources appreciated by local residents, recreationists, and other visitors to the Ashley National Forest. Recreationists, local outfitters, and guides directly benefit from these landscapes and features, while local businesses benefit from spending by Ashley visitors. Participation in recreational activities can also support wellness and personal enrichment.

In addition, the undeveloped landscapes of the Ashley National Forest offer a refuge and a place where people can reconnect with nature to escape the stresses of everyday life. Many people retreat to forests because they foster a sense of oneness with nature, which can stimulate contemplation, exploration of identity, and spirituality. In the planning area, 81.7 percent of respondents in a survey conducted of Daggett, Duchesne, and Uintah County residents agree or somewhat agree that public lands are important to local culture and heritage (Krannich 2008). Some cultural values can be described as non-use values. Non-use values are the values that people assign to economic goods if they never have and never will use them. Non-use values as a category relevant to the Ashley National Forest includes the following:

- Option value–the value placed on maintaining an asset or resource, even if there is little or no likelihood of the individual ever using it. The option value occurs because of uncertainty about future supply (the continued existence of the asset) and potential future demand (the possibility that it may someday be used). An example of an option value is desiring the maintenance of timber resources due to concern of limited future supply.
- Bequest value–the value placed on maintaining or preserving an asset or resource so that it is available for future generations. An example of bequest value is preserving species for future generations.
- Existence value–the benefit people receive from knowing that a particular environmental resource exists. An example is the preservation of wilderness areas and undeveloped spaces.

3.3.3 Regulating Services

Regulating services are defined as benefits obtained from the regulation of ecosystem processes. Examples include carbon sequestration and climate regulation, waste decomposition and detoxification, and purification of water

and air. Management of Forest and timber resources to sustain long-term Forest vegetation acts as a carbon sink to support carbon sequestration.

Water regulation represents a key service on the Forest, which contains physical, chemical, and biological characteristics that enable vegetation and soil to filter and absorb surface water. This replenishes underground aquifers and moderates runoff during rainstorms. Water filtration services, provided by well-functioning ecosystems, help maintain the integrity of the watersheds. The services also provide local communities with clean drinking water and water suitable for agricultural uses, recreation, and wildlife habitat.

By managing for the health of Forest ecosystems, the Forest directly contributes to regional water quality and helps reduce financial costs associated with quality of water supplies. Communities that may benefit from regulating services include all local area residents and those recreating on the Forest and aquatic habitats.

3.3.4 Supporting Services

Supporting services are the underlying natural processes that sustain ecosystems and enable the production of all other ecosystem services. Supporting services on the Forest include soil production, nutrient cycling, and other components that support habitat and species diversity, abundance, and distribution. Nutrient cycling represents a key supporting service.

The Ashley National Forest sustains ecosystems on which plant and animal habitat depends. For example, soil formation, nutrient cycling, production of oxygen, and evapotranspiration are factors that influence and shape characteristics of ecosystems on the Ashley National Forest. In addition, processes support the diversity and abundance of plants and animals provided by these habitats and ecosystems. For example, reforestation, natural succession, genetic variability, migration, and species interaction are shaped by these Forest characteristics.

Communities that benefit from these services include recreationists, researchers and students who benefit from opportunities for interpretation and learning. In addition, these services support communities interested in traditional and cultural uses by supporting specific habitats important for subsistence and other uses. Recreationists, local ranchers, the timber industry, and users of non-timber Forest products also benefit from this suite of services.

3.4 INFRASTRUCTURE CONTRIBUTIONS

Per the requirements outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessments, Sections 13.1 and 13.2, Infrastructure, information is required related to Forest infrastructure. An overview is provided below; additional details are included in the Infrastructure Specialist Report (Forest Service 2017f).

Infrastructure within the plan area can have a substantial impact on social, cultural, economic, and ecological conditions - both within the plan area and in the broader landscape. Infrastructure can include facilities for energy generation or transport, communications, water delivery, transportation, or recreation. These facilities directly affect conditions and uses within the plan area and may support delivery of goods and services in the broader landscape.

There are approximately 1,472 miles of Forest Service System roads, and approximately 1,107 miles of Forest Service System trails on the Ashley National Forest. Costs associated with road maintenance are shared between annual Congressional Appropriations, through County Road Agreements, and other agreements/funding sources. Total annual maintenance needs are $5,520,879. The Ashley National Forest annual roads budget has decreased from approximately $1.07 million in 2005 to $706,000 in 2015.

Other facilities supporting recreation on the Ashley National Forest include drinking and wastewater systems at campgrounds and administrative sites. The number of administrative buildings has been decreasing, as buildings are decommissioned or conveyed to other ownership to reduce operational costs.

3.5 MANAGEMENT OPERATIONS AND FOREST SERVICE BUDGET

Per the requirements outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessment, this section discusses likely budgets and other realistic assumptions.

Budgetary information for fiscal years 2011-2015 is included in **Table 3-6**, Forest Budget. Excluding funding for the plan revision, allocations for 2016 were similar to those in 2015. Overall future fiscal years are anticipated to have overall budgets similar to or less than previous years, due to the continued increase in wildfire suppression costs. In addition to wildfire suppression, other factors at the national level that are likely to require increased costs are increased fragmentation, invasive species, and changes to vegetation and wildlife habitat, due to natural and human-caused factors (Forest Service 2016f). These trends are likely to be reflected on the Ashley National Forest.

Table 3-6
Forest Budget

Fiscal Year	Salary Expenditures	Non-Salary Expenditures
2011	$6,119,981	$9,918,702
2012	$5,677,007	$7,772,712
2013	$5,232,509	$7,021,236
2014	$5,515,262	$7,250,415
2015	$5,945,919	$6,195,008

Source: Forest Service 2016f

CHAPTER 4
MULTIPLE USE

Multiple-use management of forest resources contributes a range of public benefits (36 Code of Federal Regulations 219.6(b)). The multiple-use mandate under the Multiple-Use Sustained-Yield Act of 1960 (16 U.S. Code 528-531) and the National Forest Management Act of 1976 (16 U.S. Code 1600 et seq.) is not exclusive to a single resource or use.

Key resources for the Forest are discussed in a multiple-use context below. Each of these multiple uses is assessed by defining the uses, current conditions of use, and the landscape-level drivers that affect the trend of those uses. Condition and trends of use are provided when information is available.

In addition, the relation to ecological and economic stability is discussed per the 2012 Planning Rule. The rule defines sustainability as the capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs (36 Code of Federal Regulations 219.19). The rule's objective states that plans are to guide management so that forests and grasslands are ecologically sustainable and contribute to socioeconomic sustainability, as well as have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future.

4.1 RECREATION

This section summarizes uses, settings, trends, market value, and future demands regarding recreation on the Forest. Additional information on recreational use is included in the Recreation Resource Specialist Report (Forest Service 2017e) and the Scenic Resource Specialist Report (Forest Service 2017g).

4.1.1 Existing Forest Plan Direction

As detailed in the Recreation Specialist Report, the 1986 Forest Plan (Forest Service 1986) focuses on meeting demand for recreational opportunities

through maintaining, upgrading, and adding developed recreational sites and trails while maintaining the mix of opportunities present in 1986.

The management area direction includes general prescriptions about what types of recreational opportunities or activities fit within the area emphasis, and in some cases, describes tools to help achieve the direction. Goals, objectives, standards and guidelines direct the managing of dispersed uses, trails, and developed sites. Variations for each of these tie to the management area emphasis.

Much of the management area direction repeats national and regional direction. Four Forest Plan amendments related to recreation resulted in recreation management direction for specific areas on the Ashley National Forest. In addition, the Forest Niche, approved in 2005, provided additional direction for the Forest's four distinct recreation areas and special places and its three main visitor groups.

4.1.2 Current Levels of Use and Types of Use

The National Visitor Use Monitoring Survey estimated 294,565 visits to the Ashley National Forest in 2012 (Forest Service 2012). The distribution of local and regional visitors and the types of uses are discussed in detail in **Section 3.2.6**, Tourism and Recreation.

4.1.3 Recreational Opportunities

Recreation Participation

The predominant opportunities for recreation on the Ashley National Forest include:

- viewing natural features
- viewing wildlife
- driving for pleasure
- hiking and walking
- fishing
- hunting
- developed and undeveloped camping
- motorized trail activity
- picnicking
- nature center activities

The Ashley National Forest has four areas, each of which provides distinct visitor opportunities. These include the following:

- **Flaming Gorge**: Congress established this National Recreation Area, which accounts for 16 percent of the Ashley National Forest, to provide for public outdoor recreation, and to conserve scenic, scientific, and historic resources. The primary features include the 91-mile-long Flaming Gorge Reservoir and the Green River. Red canyon walls provide a scenic backdrop for water-based recreation. Development is concentrated in a few areas, leaving the rest in a predominantly natural state.

- **Vast Backyard**: This roaded area accounts for 48 percent of the Ashley National Forest and is easily accessed. The area offers both motorized and nonmotorized remote experiences. The proximity of Wilderness and rugged mountain settings enhance the sense of expansiveness.

- **Rugged Backcountry**: Remote areas of intact natural vegetation and healthy ecosystems epitomize this setting. These areas, which account for 17 percent of the Ashley National Forest, often provide a greater sense of solitude than Wilderness because they are difficult to access.

- **High Uintas Wilderness**: Opportunities include hiking to destination lakes and summits, multi-day backpack trips, horse packing, fishing, hunting and outfitter-guide supported trips. Federally mandated Wilderness Area restrictions on motorized and mechanized use apply, as well as limits on group size. This area accounts for 20 percent of the Ashley National Forest, and also extends into the Wasatch-Cache-Uinta National Forest.

Figure 4-1, All Recreation Activities (Percent Participation 2012), show what activities visitors participated in the most on the Ashley National Forest. Visitors were able to report more than one activity. More than 60 percent of visitors to the Ashley National Forest participated in viewing natural features; 49.5 percent and 48.5 percent enjoyed relaxing and viewing wildlife, respectively (Forest Service 2012).

The percent of participation differs from the main activity that visitors reported engaging in while visiting the Ashley National Forest. Fishing was the most reported main activity at 23 percent, followed by viewing natural features (17.3 percent), hunting (14.5 percent), driving for pleasure (10.8 percent), relaxing (9.5 percent), using motorized trails (4.3 percent), and hiking/walking (4.2 percent; Forest Service 2012). All other activities were the main activity for less than four percent of visitors. Main activity participation is shown in

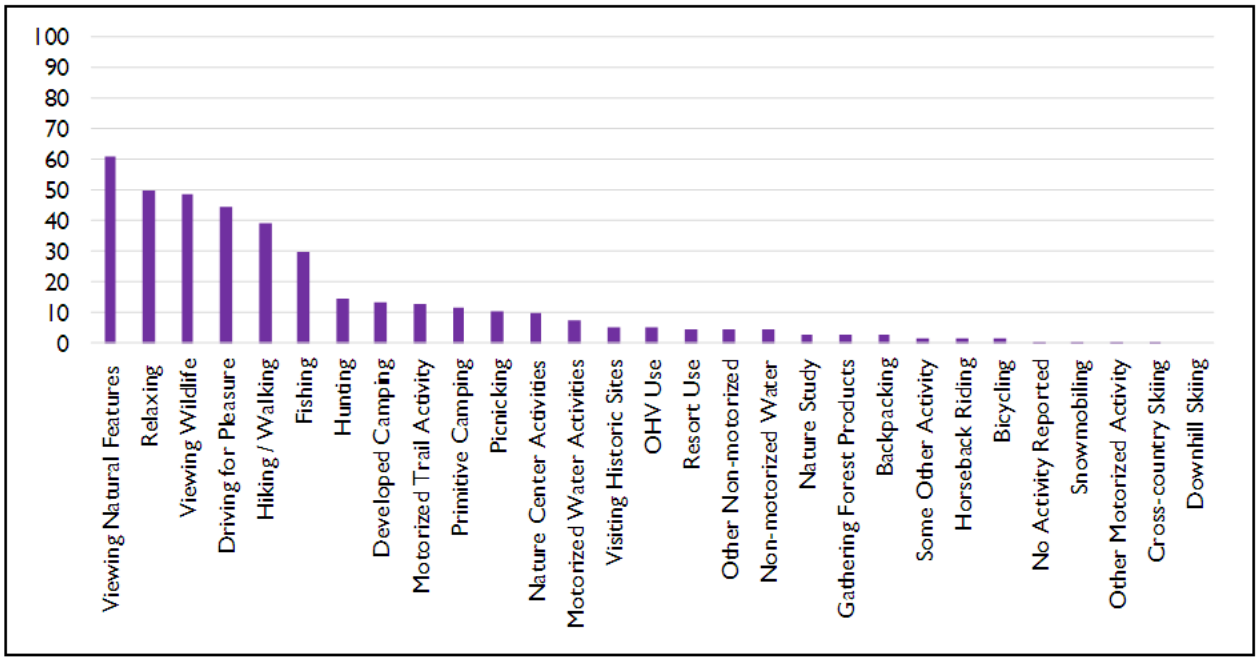
Figure 4-2, Main Recreation Activity (Percent Main Activity 2012).

Recreation Opportunity Spectrum

The Ashley National Forest uses the Recreation Opportunity Spectrum (ROS) to map, inventory, and classify the diverse range of recreational opportunities

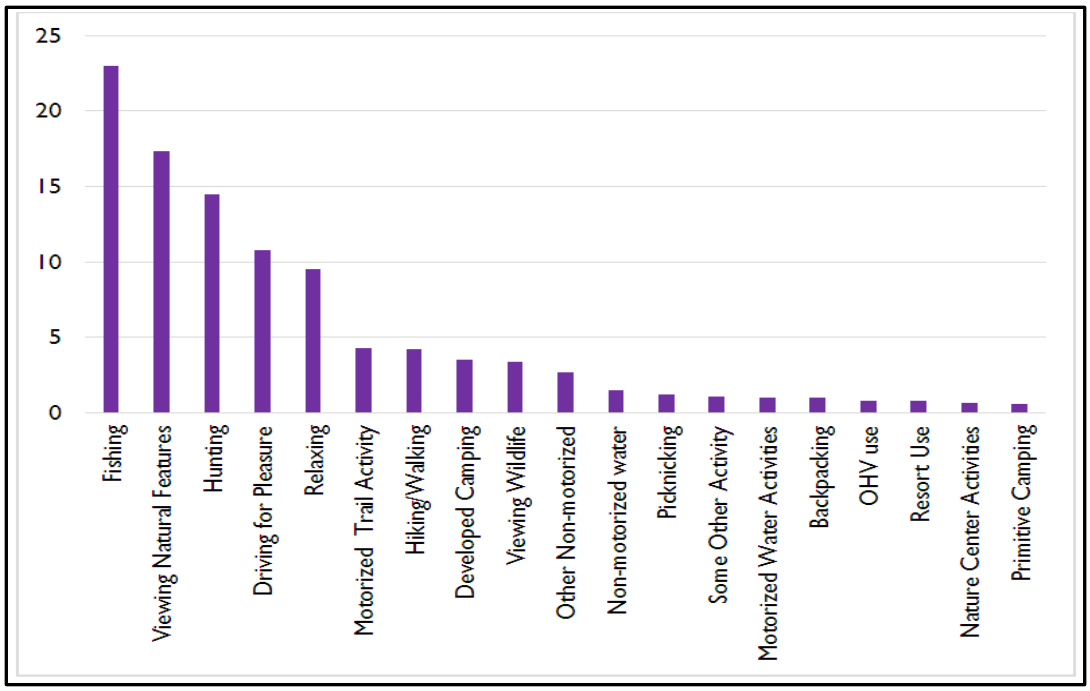
offered on the Forest. Classes on the ROS spectrum common to National Forests include primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural and modified, and rural. ROS inventories map current conditions and provide baseline information about specific settings to inform the planning process. The Forest offers opportunities in all five ROS classes common on National Forest lands. A summary is included below, and details are available in the Recreation Specialist Report.

Figure 4-1
All Recreation Activities (Percent Participation 2012)



Note: This excludes activities with 0.5 percent or less of respondents, indicating activity as the primary activity.
Source: Forest Service 2012

Figure 4-2
Main Recreation Activity (Percent Main Activity 2012)



Note: This excludes activities with 0.5 percent or less of respondents, indicating activity as the primary activity.
Source: Forest Service 2012

Primitive. Areas mapped as primitive have minimal modification to the natural environment. They are greater than 5,000 acres in size, either alone or in combination with semi-primitive non-motorized areas. Motorized activities and access are rarely allowed, and mechanized activities are limited to certain areas and uses. Interactions with other people are very limited. Facilities are limited to bridges and other structures necessary to protect the natural environment from erosion or other damage that may result from recreational use. In the High Uintas Wilderness, there are some inconsistencies within this class, based on higher concentrations of visitors. These are recorded as concentrated use areas. Primitive categorized areas make up the majority of the northwestern region of the Ashley National Forest. As of 2005, 20 percent of the Ashley National Forest is mapped as primitive on the ROS map.

Semi-primitive Nonmotorized. The area is characterized by a natural-appearing environment, usually greater than 2,500 acres in size (alone or in combination with primitive and semi-primitive motorized) and a half-mile or more from motorized routes. Interaction between visitors is low, and there may be minor evidence of human activities. These areas also include motorized routes that are used on rare occasion for administrative access to water developments, fences, or for other infrequent management needs. Semi-

primitive non-motorized areas comprise 27 percent of the Ashley National Forest, based on the ROS map.

Semi-primitive Motorized. These areas are characterized by a predominantly natural-appearing environment. The areas are usually greater than 2,500 acres in size, alone or in combination with semi-primitive non-motorized recreation. The concentration of users is low, but there is some evidence of other visitors. The area is managed with minimal on-site controls. Semi-primitive motorized areas comprise 20 percent of the Ashley National Forest, based on the ROS map.

Roaded Natural. These areas have moderate evidence of the sights and sounds of man. Such evidence is usually harmonized with the natural environment, though areas of timber harvest - and other resources are included in this class. Interaction between users may be frequent, and evidence of other users is common. Conventional motorized travel is allowed and is planned in design and construction of facilities. Roaded Natural areas make up 32 percent of the Ashley National Forest, based on the ROS map.

Rural. These areas are characterized by a natural environment that has been modified by structure and vegetation manipulation, or pastoral agricultural development. Resource use practices may be used to enhance specific recreational activities or to maintain vegetation and soils. Sights and sounds of humans are readily evident, and interaction between people is moderate to high. There are many facilities designed for use by a large number of people. Facilities for intensified motorized use and parking are available. Ski areas and marinas are examples of Rural ROS settings on National Forests. Rural areas comprise more than one percent of the Ashley National Forest, based on ROS mapping.

4.1.4 Recreation Setting

The Ashley National Forest is divided into Ranger Districts with varying geophysical features and a mixture of recreational opportunities in each. The infrastructure supporting access and recreation is influenced by the physical characteristics and recreational settings, past management of each area, and past decisions about recreational activities that each area offers. The following descriptions include some of the common recreational activities occurring in each area and the facilities associated with each district. However, recreational participation rates by activity in each Ranger District are not quantified, because few data have been collected that are accurate at the local Ranger District or geographic area scale.

Flaming Gorge Ranger District

The Flaming Gorge Ranger District is most known for its geology and for fishing opportunities on the Flaming Gorge Reservoir and the Green River, and it attracts visitors nationally. Catches include record lake trout and other fish species in Utah and Wyoming. The area overall has the most developments supporting water and road-based opportunities out of all the Ranger Districts.

The area includes the whole Flaming Gorge niche area and a part of the Vast Backyard niche area.

Recreation-associated facilities include:

- The entire FGNRA, Sheep Creek-Spirit Lake Scenic Backway, Sheep Creek Geologic Area, and sections of the Flaming Gorge-Uintas Scenic Byway and Carter Military Road
- 87 Forest Service developed recreation sites, permitted resorts and marinas, and private resorts, and historic guard station cabin rental
- 461.6 miles of system roads
- 213 miles of system trails
- Within the FGNRA: Flaming Gorge Reservoir, Dam, and Red Canyon Visitors Center, a section of the Green River popular for rafting and fishing, boat-in campgrounds, resorts, marinas, developed campgrounds, day-use areas, dispersed camping areas, and the historic Swett Ranch with interpretive facilities. Outfitters and guides support water-based activities
- Outside the FGNRA: developed campgrounds, Ute Mountain Fire lookout tower, forest cabin rental, a lodge, dispersed camping areas, numerous small lakes popular for fishing, OHV trails, and non-motorized trails

Vernal Ranger District

The Vernal Ranger District is most used by residents of northeastern Utah, northwestern Colorado, and southern Wyoming. These visitors often have a long tradition of using certain areas for annual gatherings of families and friends. Hunting, fishing, camping, and firewood gathering are common activities. Relatively gentle terrain on the eastern half and a vast backyard niche of the district allows for few limitations to travel, and several loop roads exist. U.S. Highway 191 provides year-round access to the higher elevations. The western half of the district, a rugged backcountry niche, is more remote and mountainous and contains the majority of non-motorized trails. Snowmobile use is extensive in winter, and non-motorized winter travel opportunities are provided through designated ski trails and two yurts.

Recreation-associated facilities include:

- A section of Flaming Gorge–Uintas Scenic Byway (U.S. Highway 191), Red Cloud-Dry Fork Loop Scenic Backway, and a section of Carter Military Road are special designations that add to recreational opportunities. Additional features include Ashley Gorge and many mountain reservoirs and lakes.

- Twelve developed recreation sites, concentrated use areas of dispersed recreation, yurts, and historic Forest Service cabins as rentals
- 445.4 miles of system roads
- 358 miles of system trails

Duchesne-Roosevelt Ranger District

This area contains the High Uintas Wilderness and has the highest percentage of non-motorized recreation settings and undeveloped lands of any area on the Ashley National Forest. The area provides access, via roads and trails, as the southern gateway to the High Uintas Wilderness. Road-based recreation along the main river and road corridors includes camping and day-use opportunities in developed or dispersed areas. More remote areas provide primitive, backcountry recreational opportunities with a relatively high degree of solitude, challenge, and risk for Ashley National Forest visitors. There are a few designated OHV trails at the lower elevations of the area, but most trails provide for non-motorized travel. Recreation-associated facilities include:

- The High Uintas Wilderness provides a nearly pristine natural setting. Opportunities are available for horse and foot travel to lakes and other natural features. Longer-duration activities include backpacking, stock packing, and primitive camping. Fishing, hunting, and climbing are common. The wilderness includes 456,705 acres. It is managed jointly by the Ashley and Wasatch-Cache-Uinta National Forests under the 1997 High Uintas Wilderness Management Plan. The Ashley National Forest manages 60 percent of the High Uintas and is the lead Forest.
- 34 developed recreation sites, two permitted lodges, concentrated dispersed use areas, and one private lodge
- 307 miles of system roads
- 461 miles of system trails
- Stillwater Reservoir, Moon Lake, and many smaller lakes and reservoirs; the Uinta, Yellowstone, North Fork Duchesne, and other rivers; and supporting lodges, marinas, and other facilities to support fishing and other water-based activities. Outfitters and guides support hunting, stream fishing, and backpacking activities.

The South Unit of the Duchesne-Roosevelt District receives only a small amount of the Ashley National Forest's recreation use. Most visitors are residents of the Uinta Basin or Carbon County. The predominant recreational activity is big game hunting, although hiking and camping not associated with hunting occur as well. Outfitter and guide services support some of these activities. Recreation-associated facilities are as follows:

- The section of U.S. Highway 191 from Duchesne to Price, Utah - known as the Indian Canyon Scenic Byway - bisects the South Unit. This is also a segment of the larger Dinosaur Diamond Scenic Byway.
- Reservation Ridge Scenic Backway follows the divide of this range from U.S. Highway 191 west to Highway 6.
- Avintaquin Campground is located along Reservation Ridge. There are no concentrated use areas or developed trailheads associated with this campground.
- 258 miles of system roads and 75 miles of system trails provide for recreational travel and access.

4.1.5 Ecosystem Services

Recreation represents an important cultural value for visitors and area residents. Values of recreation can be described as use values or non-use values. Recreational fishing, hunting, boating, hiking, biking, off-roading, and skiing are all nonmarket use values associated with recreation on the Ashley National Forest. Non-use values associated with recreation include existence values, such as the inherent worth in knowing that the pristine High Uintah Wilderness exists on the Ashley National Forest.

The use of nonmarket-valued goods, such as recreation use, by society is usually complemented by market goods and services - such as the consumption of fuel, lodging, and food. See **Section 3.2.6**, Tourism and Recreation, for a discussion on market values of tourism associated with recreation.

4.1.6 Scenic Character

The scenic character of the Ashley National Forest is vital among the amenities contributing to the overall lifestyle and tourism trends in southwestern Wyoming and northeastern Utah. The Ashley National Forest is the scenic backdrop to travel, work, and daily life for the area's residents and visitors. The general scenic condition was also key to securing several of the Ashley National Forest's national designations and contributes to the overall opinion on ecosystem health and Forest management decisions in the area.

The results of scenic integrity mapping show about nine percent of Ashley National Forest land with low scenic integrity, most of which is the result of timber production (clear cuts) and other traditional uses. Scenic integrity is high and very high on 88 percent of the Ashely National Forest, moderate on three percent, and low to very low on the remaining nine percent of the Ashley National Forest (for more details see Forest Service 2017e).

While less quantifiable than other measures of Forest health, strong visual character or scenic value of the landscape can positively enhance the opinions of users and their recreational experiences. Poor visual character can influence an opinion of poor Forest health and poor Forest management.

4.1.7 Recreation Trends

About 75 percent of Utah's estimated three million people live in four counties along the Wasatch Front. The current population growth in Utah is expected to continue and to almost double by 2060 (Utah Governor's Office of Management and Budget 2012). This information is important because National Visitor Use Monitoring Program reports indicate that 75 percent of visitors to the Ashley National Forest live within 200 miles of the Ashley. This distance zone includes most of the land in the Wasatch Front counties. Uintah Basin predictions include people residing in Daggett, Duchesne, and Uintah Counties, Utah, where substantial growth is also predicted. Smaller population increases are predicted for Uinta and Sweetwater Counties, Wyoming, and for the State of Wyoming for the same timeframe (see **Section 2.2**). National Visitor Use Monitoring Program monitoring indicates little international visitation to the Ashley National Forest. International visitors represent 1.6 percent of surveyed visitors in 2012. The Ashley National Forest has regional significance for recreational use because of its location on the primary route between the Greater Yellowstone Area National Parks, the national parks in southern Utah, and Rocky Mountain National Park in Colorado.

An Outdoor Recreation Participation Study for 2015 (The Outdoor Foundation 2015) shows a growth in outdoor activities in ages 6 to 12 and 25 to 44, a decline in ages 18 to 24 and 45 plus, and no change in ages 13 to 17. Overall, the participation rate (percentage of population) in outdoor activities nationwide has declined slightly from 2006 to 2014, but the number of participants has increased with the national population increase.

As detailed in the Recreation Specialist Report, based on the predicted population increases and tempered by the decline in per capita outdoor recreation participation, an estimate of 15 to 30 percent growth in visitation is predicted over the next 15 years on the Ashley National Forest.

The trend toward an older population is expected to continue. For more extensive population trend information, see **Section 2.2.2**, Population Size, Density, and Trends. Trends in recreation visits nationally include shorter trips of one to five days and an increasing percentage of one-day visits. Based on surveys, most visitors spend at least some time in nature appreciation, which is defined as such activities as viewing scenery, wildlife, or other features, studying nature, and walking.

The number of people camping has continued to increase since the 1960s. Since then, the percentage of people who camp with self-contained recreational vehicles has increased, while tent and open-air camping has decreased. The trailers and motorized vehicles in use, including boats, have ever-increasing amenities. The average size of recreational vehicles being purchased also appears to be increasing. This suggests a general trend away from more primitive recreational activities.

Results of the Public Lands and Utah Communities Survey (Krannich 2008) show, based on responses to resource use questions, that residents of local counties value recreational opportunities on public lands. The majority of these people would like to see the present mix of opportunities retained. Many survey participants would like to see trail opportunities for motorized vehicle travel increase. Others would like to see more areas and trails available for mountain biking and other non-motorized activities.

4.1.8 Risks, Stressors, and Drivers

Recreational demand is likely to continue to increase with population increases. Increased recreational demand would result in the need to build additional recreational facilities and infrastructure, and could impact sensitive resources. Conflicts between non-consumptive recreational uses (e.g., wildlife viewing) and consumptive recreational uses (e.g., hunting and fishing), as well as quiet recreational uses (e.g., hiking) and motorized uses, are likely to persist and increase, with increased recreational use on the Ashley National Forest.

Activities likely to show increases in overall rate of participation (as a percentage of visitation) are motorized trail activities, bicycle trail travel, and visits to developed areas for motorized and non-motorized day-use activities (water-based, trail-based, interpretive, and viewing). Since the publication of the 1986 Forest Plan (Forest Service 1986), recreational activities and equipment have evolved. New activities that are occurring on the Ashley National Forest include OHV side by sides, geo-caching, mountain biking, fat-tire mountain biking, and stand-up paddle boarding.

Based on expected increases in visitation and activities trends, increased demand is expected for all ROS classes. However, based on activity and other preference trends, the ROS classes likely to see the greatest increases in recreation visitation are the three classes offering motorized opportunities and a mix of opportunities for day-use activities. The three classes are rural, roaded natural and modified, and semi-primitive motorized (for more information refer to the Recreation Specialist Report, Forest Service 2017e).

Conflicts can arise when the recreational use of an area is at odds with increased demand for other resource uses. For example, increased demand for timber harvesting is incompatible with primitive and semi-primitive types of recreation, where solitude and a quiet soundscape are valued.

4.1.9 Contributions of Use/Enjoyment to Economic Sustainability

As noted in **Section 3.2.6**, Tourism and Recreation, recreation on the Ashley National Forest provided an estimated 26 jobs and $800,000 in labor income in 2014 to the region's economy. Studies by Headwaters Economics indicate that as extractive resource uses decline throughout the West, the economic importance of recreation and protected lands is increasing (Headwater Economics 2012).

The type of recreation on the Ashley National Forest may influence the level of economic contributions. For example, the national average spending per day for nonresident motorized users was estimated to be 41 percent higher than daily spending by hikers or bikers (White and Stynes 2008). Therefore, management decisions that impact the type of recreational use permitted, such as those that restrict motorized use, may impact the level of economic contributions.

4.1.10 Key Indicators

- level of recreation visitation
- number and capacity of developed sites
- recreation-related employment and income
- acres of wilderness

4.1.11 Summary

Recreation on the Ashley National Forest represents an economic sector of growing importance for some local communities. Recreation opportunities include a broad spectrum of experiences, from hunting and OHV use to hiking and wildlife viewing. Maintaining a balance of recreation uses and levels of use will support the ecological sustainability of recreation on the Ashley National Forest and allow for future use by areas residents and visitors, and for future economic contributions.

4.2 TIMBER RESOURCES

This section summarizes the current Ashley National Forest product uses, the interaction of uses of Ashley products with the ecological and economic setting, and the sustainability of these uses. Additional information is found in the Fire and Fuels Specialist Report (Forest Service 2017h).

4.2.1 Existing Forest Plan Direction

In the 1986 Forest Plan (Forest Service 1986), allowable total sale program quantity - consisting of fuel wood, saw timber, and other products - was set at 21 MMBF per year for the planning period, based on approximately 528,200 suitable acres. Long-term sustained yield is 6.319 MMCF per year. While most of the volume harvested will be dead lodgepole and ponderosa pine, there will continue to be some green trees harvested. This assumed sale quantity (21 MMBF) is somewhat below the "allowable cut" on the Ashley National Forest.

Under the 2012 Forest Service planning rule, no annual allowable sale quantity calculation is required, but the Forest Service must generate a long-term sustained-yield calculation as the ceiling for timber harvest.

4.2.2 Current Levels of Use and Types of Use

The average harvested on an annual basis over the past 10 years was approximately 11,557 hundred cubic feet (CCF) or 5,778 mbf. Fuelwood represents approximately 49 percent of material removed, post and poles representing approximately 20 percent, and softwood saw timber representing

the remainder (see **Table 4-1**, Average Annual Timber Product Removal (2006-2015)).

Fuel wood represents an important fuel source for some individuals in the socioeconomic planning area. With the exception of Sweetwater County, Wyoming (where only 1.5 percent of homes use wood as primary fuel source), all socioeconomic planning area Counties have more than six percent of homes where wood fuel is a major heating source. In Daggett and Duchesne Counties, Utah, this figure is higher than 10 percent (15 percent and 12 percent respectively; U.S. Census Bureau 2015).

Table 4-1
Average Annual Timber Product Removal (2006-2015)

Type of Product	CCF	Mbf
Harvest – softwood saw timber	3,448.8	1,724.4
Harvest – softwood pulp	0.0	0
Harvest – hardwood saw timber	0.0	0
Harvest – hardwood pulp	0.0	0
Poles	1,405.4	702.7
Posts	983.5	491.8
Fuelwood	5,719.0	2,859.5
All other products	0.0	0
Total	**11,556.7**	**5,778.4**

Note: A conversion factor of 2 CCF per mbf was used to provide an approximation of mbf.
Source: Forest Service 2016g

4.2.3 Existing Conditions and Trends

Conifers cover approximately 45 percent of the Ashley National Forest. Specifically, these are the lodgepole pine and Engelmann spruce and subalpine fir communities, which depend on elevation and aspect. Pockets of Douglas-fir and aspen occur, and isolated occurrences of bristlecone and limber pine are also found. Forested Vegetation types are displayed in **Table 4-2**, Forested Vegetation Types in the Ashley National Forest.

Detailed information on vegetation composition and distribution, including structure stage by vegetation type, is included in the Terrestrial Ecosystem Report (Forest Service 2017i).

Table 4-2
Forested Vegetation Types in the Ashley National Forest

Forest Type	Forested Acres	Percent of Forested Acres	Percent of Total Acres
Lodgepole pine	76,784	8.47	5.48
Mixed conifer	315,933	34.83	22.56
Ponderosa pine	37,876	4.18	2.70
Spruce	144,494	15.93	10.32
Douglas-fir	47,880	5.28	3.42
Aspen	152,692	16.83	10.90
Riparian	7,603	0.84	0.54
Pinyon-juniper	122,444	13.50	8.74
Other conifer	476	0.05	0.03
Other	811	0.09	0.06
Total	**906,993**	**100.00**	**64.77**

Source: Forest Service 2016h

Throughout much of the Ashley National Forest, current vegetation and age class have been influenced by fire suppression and mountain pine beetle outbreak, as well as past commercial timber harvest. Vegetation condition class (VCC) is a measure of departure from reference (prior to Euro-American settlement or natural or historical) ecological conditions. Departure from historic conditions that typically results in alterations of native ecosystem components, where VCC IA represents the lowest level of departure from historical conditions, and VCC IIIC represents the highest degree of departure.

Most of the Ashley National Forest is in VCC II A and B, representing a moderate level of departure from historical conditions (see **Table 4-3**, VCC Class by Vegetation Type, below).

Table 4-3
VCC Class by Vegetation Type

Vegetation Types	VCC IA	VCC IB	VCC IIA	VCC IIB	VCC IIIA	VCC IIIB	Other*
Ponderosa pine	0%	7%	48%	26%	16%	0%	2%
Lodgepole pine	0%	0%	44%	46%	5%	2%	3%
Douglas-fir	0%	11%	42%	37%	7%	0%	3%
Mixed conifer	0%	1%	65%	29%	2%	1%	3%
Engelmann spruce	2%	0%	85%	4%	0%	2%	7%
Miscellaneous	1%	2%	55%	22%	6%	3%	10%
Seral aspen	0%	1%	35%	50%	12%	1%	1%
Persistent aspen	0%	1%	16%	55%	26%	0%	2%
Sagebrush	1%	5%	57%	25%	8%	1%	4%
Pinyon juniper	1%	20%	42%	21%	2%	0%	13%
Desert shrub	6%	5%	3%	79%	0%	0%	7%

*water, barren ground, sparse vegetation
Source: Forest Service 2017h

In addition, vegetation conditions can be examined in the context of fire regime, which describes the frequency, predictability, and severity of fire in an ecosystem. For many vegetation types on the Ashley National Forest, the fire regimes have moderate to high departure from natural fire regimes. These, in turn, are responsible for higher tree densities and fuel accumulations, which support wildfires with uncharacteristically severe effects (Arno 1996). Details of VCC and fire regime by vegetation type are included in the Fire and Fuels Report (Forest Service 2017i). They are summarized below for key vegetation classes relevant to timber resources.

Although the return of fire is trending back to historical conditions in ponderosa pine habitat, there is still a moderate degree of departure from historical conditions. This is due to a structure that includes high densities in the younger tree layers. Much of the ponderosa pine habitat has received some sort of past treatment. Historic documents describe much of the area being salvaged in the 1920s, and again in the 1950s and 1980s, in response to beetle epidemics (Forest Service 2005). In total, about 50 to 75 percent of the ponderosa pine has also been treated in the past 20 years by prescribed burn or other fuel reduction.

The lodgepole pine forest type historically burned about every 150 years, and fires were usually stand-replacing in scope. Lack of fire in this geographic area since the late 1800s has resulted in a moderate departure from historical conditions. This also corresponds to a moderate risk of key ecosystem elements being lost due to uncharacteristic fire behavior. Commercial timber production was a common activity before the beetle outbreak and was accelerated afterward in an effort to salvage the standing dead trees. Lodgepole forest suffered the effects of a mountain pine beetle outbreak in the early 1980s, which killed 70 to 90 percent of the overstory trees in some areas (e.g., in the eastern half of the Forest).

In Douglas-fir forests on the Ashley National Forest, the presence of low- to mixed-severity fire has been largely absent and is outside historical ranges. Fire suppression leads to Douglas-fir forests becoming increasingly dense and more mature. Such conditions can lead to forest health issues that include widespread Douglas-fir beetle epidemics and increased incidents of dwarf mistletoe infection (Giunta et al. 2016). Although most of the trees killed were salable, very little has been salvaged.

In other portions of the Ashley National Forest (e.g., the South Unit), vegetation is dominated by semi-desert shrub communities mixed with pinyon/juniper woodlands. In these areas, conifer encroachment into shrublands is a dominant issue. Productive riparian zones also occur along river corridors, as seen in the Glacial Canyon and Stream Canyon Land Type Associations.

Although large fires have burned a significant number of acres across the Ashley National Forest, they are generally rare, with less than 1 percent burning

greater than 1,000 acres. The total number of acres burned on the Ashley National Forest has increased considerably over the last three decades, with a shift toward more frequent and larger fires. In addition, there has been an increase in human improvements in or next to the wildland fuels. These improvements continue to push outward from communities into the areas that have a higher risk of fire.

The fire index rating indicates that 73 percent of the planning area has a low to moderate fire risk rating. The rating combines the likelihood of a fire occurring and the potential hazard (fire behavior characteristics) in relation to current values of concern. However, excluding fire and vegetation changes due to natural and human causes would likely show that more acres would continue to move toward the moderate to high risk (see Forest Service 2017i).

There are seven local mills or potential large-sale bidders in the Uintah Basin, including two in Duchesne, two in LaPoint, one in Tridell, one in Neola ,and one in Vernal. The trend in demand for Ashley National Forest wood products, particularly for non-saw timber material, is declining. Supply for non-sawtimber material is currently exceeding demand. The offering of this material in recent years has exceeded the local purchasers' capacity due to a backlog of prior wood sales. Demand for sawtimber material, especially green sawtimber, has remained relatively constant in recent years. Fuel woods consistently represent the bulk of forest products sold from the Ashley National Forest.

4.2.4 Risks, Stressors, and Drivers

A history of fire suppression, other human uses, and vegetation management direction have resulted in a departure from historical vegetation condition in much of the Ashley National Forest. Increased density of vegetation and encroachment of conifers into shrub communities further increases the chance of high-intensity wildfire, particularly in the wildland-urban interface where the chance of human-caused ignition is increased. Should fire occur, timber resources would be impacted and the social, economic, and ecological contributions would be impacted. Overly dense forest conditions have also contributed to increased insect and disease problems, notably in outbreaks of mountain pine beetle.

Projected future temperatures appear to continue the warming trend, while projections for precipitation are more uncertain. Increasing air temperatures are expected to change the frequency, severity, and extent of wildfires. Large wildfires have occurred during a warmer climatic period in the past two decades. This signifies a future in which wildfire is an increasingly dominant feature of western landscapes (Vose et al. 2016). Details of the influence of temperature and precipitation on fire risk are included in the Fire and Fuels Report (Forest Service 2017h).

In the short term, management practices that result in lower tree densities may provide for increased resilience from drought. Well-established research indicates that lower stocking levels result in reduced tree mortality.

4.2.5 Ecosystem Services

Timber represents a provisioning service with both market and nonmarket value. Use of fuel wood represents a traditional source of fuel and a subsistence use for some area residents. In addition, timber enhances the forest scenery, attracting visitors and providing cultural services for visitors and residents. Participants in the 2008 Beliefs and Values study (Russell 2008) describe timber as having aesthetic, as well as economic, value.

Timber can also act as a supporting service for wildlife. Some Beliefs and Values study (Russell 2008) participants noted that these resources are a scarce resource that should be conserved in an arid ecosystem. Others noted a connection with regulating services and emphasized the significance of connections between timber, fire, and watersheds. These participants suggested that water availability and quality is affected by timber management policies that are perceived to contribute to conditions that result in fires that impact watersheds. This perspective suggests these watershed impacts directly influence local economies and lifestyles.

4.2.6 Ecological Sustainability

Timber harvest is an essential tool for mitigating the intensity and severity of wildfires, maintaining ecosystem integrity, and ensuring a wide variety of benefits from the Ashley National Forest. The value of harvesting often extends beyond the value of the products removed or the value of the related employment opportunities provided. Timber harvesting can be used to control stand densities, improving individual tree growth and vigor. Timber harvesting can, through mimicking natural disturbance events, be used to prevent or reduce the undesirable effects of forest insect and diseases by promoting species and age class diversity, as well as reduce hazardous fuel loads.

In the 2008 Beliefs and Values study (Russell 2008), the major concern related to timber product resources related to comments linking existing Ashley National Forest conditions with fire concerns and the potential economic benefits of increased timber harvesting. More specifically, participants felt that beetle-damaged trees represent a risk of higher fire danger. Many participants recommended more aggressive timber harvest as a method of controlling fire risk and note that timber harvest can represent a more controlled method of management as compared with natural and prescribed burns.

Similarly, of the survey participants in Daggett, Duchesne, and Uintah Counties, 44 percent believed that prescribed burns should be kept at similar to levels to current conditions. An additional 36 percent felt that increased prescribed burning was appropriate (Krannich 2008). Thirty-two percent of participants felt

that forest thinning at similar to current levels was appropriate, while 53 percent preferred increased thinning (Krannich 2008).

4.2.7 Contributions of Use/Enjoyment to Economic Sustainability

Timber harvesting represents a traditional source of employment in the socioeconomic planning area. Ashley National Forest products from the Ashley are not currently a major economic driver in the local or regional economy due to the small area suitable for harvest and the generally lower commercial value of wood products harvested. Locally, wood product sales help support a number of saw mills and smaller business and provide an inexpensive source of fuel wood for area residents.

In addition, in a 2008 survey, 80 percent of respondents in Daggett, Duchesne, and Uintah Counties felt that having forested areas that are available for timber harvesting is moderately or very important to the overall quality of life in their community (Krannich 2008).

4.2.8 Key Indicators

- Volume of wood product offered for sale
- Non-wood forest product produced or collected
- Total and per capita consumption of wood production
- Changes in fire regime and condition class
- Jobs and employment in timber products sector

4.2.9 Summary

Timber and woodland products are a traditional use of Forest resources and support local businesses. Wood products are also important for some local individuals and communities as a source of fuel wood. Timber production and timber harvest are important tools to use as part of fire risk management. They help maintain ecosystem integrity and the ability of a forest ecosystem to support multiple ecosystem services.

4.3 RANGE RESOURCES

This section summarizes the historical and current levels of livestock grazing and the influence on local economic and ecological sustainability. This section follows direction outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessment, Section 13.32, Assessing Multiple Uses. Additional information on rangeland conditions is included in the Terrestrial Ecosystems Report (Forest Service 2017i).

4.3.1 Existing Forest Plan Direction

The 1986 Forest Plan (Forest Service 1986) allows for continued use of forage by domestic livestock, assuming forage at or near 1986 levels. The 1986 Forest Plan stated that the Forest provides grazing for a total of about 75,000 AUMs each year.

4.3.2 Current Levels of Use and Types of Use

Livestock grazing has a long history of use in the socioeconomic planning area. Cattle and sheep ranching was a primary economic activity during the late nineteenth and early twentieth centuries for the communities surrounding the Ashley National Forest (Shamo 2012).

Grazing continues to be an important use in the Ashley National Forest. Grazing is managed in allotments, designated areas where the number of livestock and period of use are stipulated. There are currently 65 active grazing allotments in the Ashely National Forest. Active allotments are displayed in **Figure 4-3**, Ashley National Forest Active Grazing Allotments.

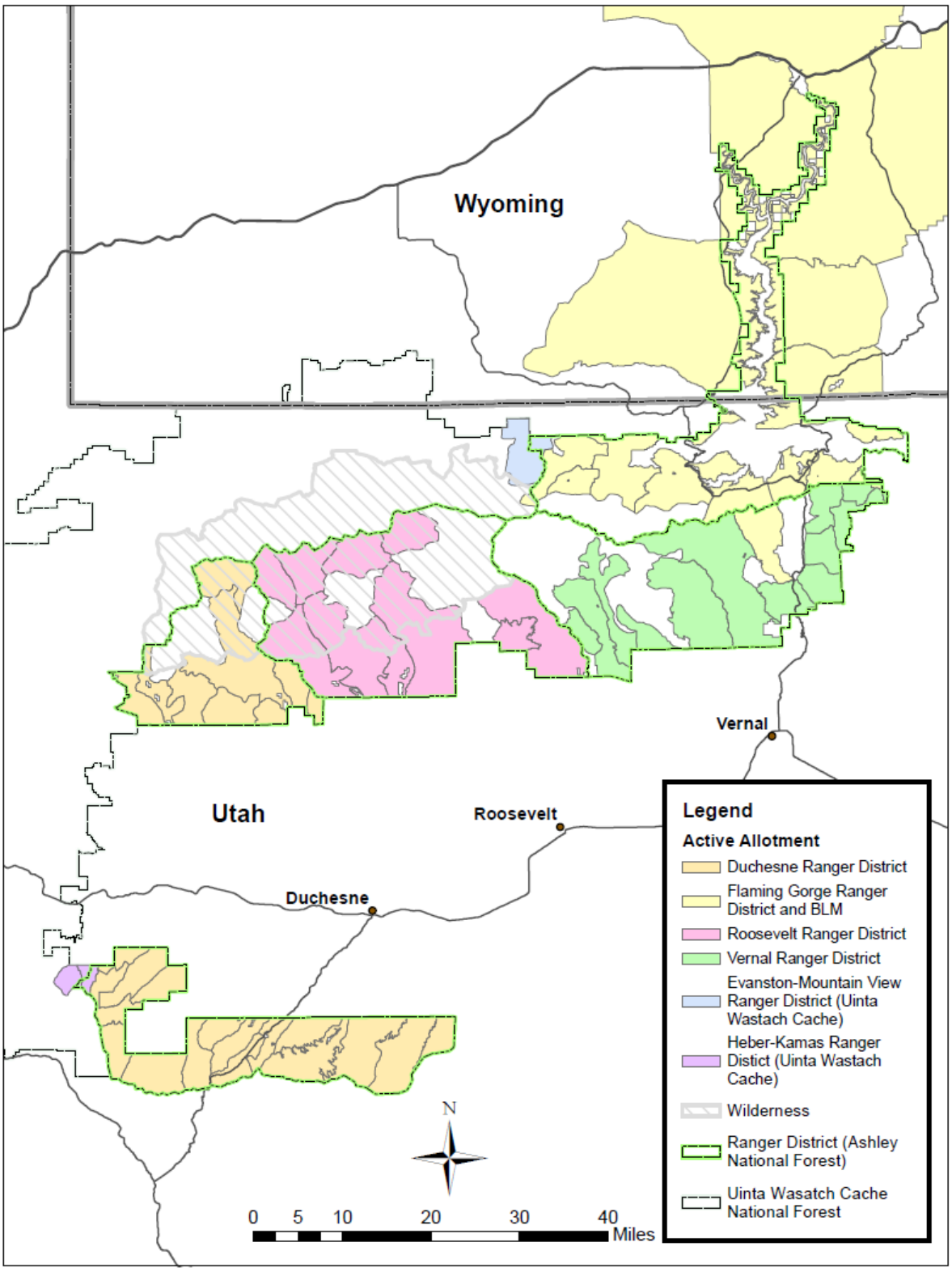
The Forest Service permits livestock grazing based on occupancy and use of National Forest System (NFS) lands that is determined by numbers of livestock and season of use. As noted in **Section 3.2.5**, livestock occupancy of NFS lands is measured and billed in HMs. According to 36 C.F.R§ 222.50(c):

"A head month is a month's use and occupancy of range by one animal, except for sheep or goats. A full head month's fee is charged for a month of grazing by adult animals; if the grazing animal is weaned or six months of age or older at the time of entering National Forest System lands; or will become 12 months of age during the permitted period of use. For fee purposes five sheep or goats, weaned or adult, are equivalent to one cow, bull, steer, heifer, horse, or mule."

A grazing permit is a document authorizing livestock to use NFS lands or other lands for livestock production. Term grazing permits are issued for periods up to 10 years, and grant the permittee priority for renewal (36 C.F.R. § 222.1(5)).

Permitted use is the number of animals allowed to graze during a grazing season (i.e., period of use) on a defined area of NFS administered lands as specified in the grazing permit. Authorized use is the use specified on the annual bill(s) for collection and verified by the permittee's payment of fees. Typically, permitted and authorized use are the same or similar each year unless there is an annual modification from permitted use due to conditions such as drought, forage production, or permittee request, which results in a different authorized use. Permitted use may be adjusted to improve or sustain resource conditions and be compatible with other uses. Permitted use is periodically evaluated using long-term trend studies to determine if livestock numbers, season of use, and level of forage utilization are at the appropriate level to maintain the sustainability of rangeland resources and are compatible with other rangeland and forest uses.

Figure 4-3
Ashley National Forest Active Grazing Allotments



Source: Forest Service 2016d

Permitted and authorized use may also be used as indicators of grazing capacity for NFS administered lands. While permitted livestock occupancy is measured in head months, forage consumption is measured in AUMs. Authorized AUMs may be evaluated to determine contributions from federal lands grazing to jobs and income to specific areas at specific points in time. One AUM is the amount of forage a 1,000-pound mature cow and calf consume in a 30-day period, which is about 780 pounds of dry weight forage (Bedel 2005). Trends in grazing levels on the Ashley National Forest are shown in **Table 4-4**, Trends in Permitted Grazing Levels. Since 1980, permitted grazing in the Ashley National Forest has decreased by approximately one percent.

Table 4-4
Trends in Permitted Grazing Levels

District[1]	AUMs	Change in AUMs 1980-2016
Flaming Gorge	13,695	-48
Vernal	23,199	+2,520
Roosevelt	11,267	-992
Duchesne	22,611	-2,391
Total	*70,772*[2]	*-911*

[1]Roosevelt and Duchesne managed as the Roosevelt/Duchesne District
[2]AUM data are variable. Total AUMs reported vary based on levels in the database at the time of report creation.
Source: Forest Service 2016d

4.3.3 Rangeland Condition and Trends

When allotment condition trends and summaries are examined, common trends emerge that are impacting rangeland conditions, specifically forage production. While conditions vary by allotment, some common issues include the following:

- Invasive annuals including cheatgrass, storks bill, tumble mustard, and musk mustard are increasing in some allotments. Increase of these invasive annuals is associated with decline in forage for cattle, and they mark a decline in ecological condition.
- Historical sagebrush treatments that reduced or removed sagebrush were designed to increase forage for cattle. The return of sagebrush and increase of less productive and less palatable herbaceous species has reduced the forage base for cattle in some places.
- Fire, where it occurs has supported forage re-generation. Due to historical fire suppression, conifer species are encroaching into some sagebrush habitat.
- Drought has resulted in a temporary decline in forage in some allotments.
- Grazing has generally been found to be compatible with aspen regeneration on the Forest allotments.

- Adjustments in management have been needed in some high use riparian areas

Long-term monitoring studies across the Ashley National Forest indicate that most allotments are in satisfactory condition. Rangeland indictors such as ground cover, species diversity, plant productivity, and shrub canopy cover are measured and documented in these studies. Rangeland conditions for specific plant communities are summarized below and discussed in detail in the Terrestrial Ecosystems Report (Forest Service 2017h).

In alpine communities, livestock grazing has occurred in mostly mesic, turf, and dry meadow alpine communities over a 100 year period, but domestic sheep grazing has fallen considerably in both numbers and the area grazed over the last few decades. Recent vegetation reports from several high elevation grazing allotments indicate that, "the plant communities grazed by livestock are in satisfactory condition with stable trends or are trending toward desired condition." Long-term trend studies for about a 50 to 60 year period show that current conditions are satisfactory and trend is stable concurrent with livestock grazing.

In aspen communities livestock browsing of aspen sprouts has been minimal and not sufficient to affect successful recruitment or diminish stand persistence. Livestock grazing in the terms of numbers, class of livestock, and management is expected to remain relatively constant during the next plan period. Persistent aspen is expected to be sustained and successful aspen recruitment is expected to occur concurrent with contemporary livestock stocking rates and management strategies. Livestock grazing is expected to minimally effect seral aspen communities.

In sagebrush communities, historically, heavy livestock grazing depleted and/or reduced vigor of native herbaceous understories and increased or accelerated the increase of sagebrush canopy cover. To maintain or maximize forage production in the most productive sagebrush communities such as mountain big sagebrush, mechanical, prescribed fire, and herbicide treatments were implemented to remove sagebrush. This included plow and non-native grass seeding treatments of thousands of acres of mostly mountain big sagebrush. Since 1980, most sagebrush treatments have been prescribed fire. Sagebrush has returned, or is currently returning, to pre-treatment cover percentages. Under existing livestock numbers and season of us, sagebrush canopy cover is expected to remain within a sustainable condition under light to moderate grazing intensities. In sagebrush communities with heavy grazing intensities, sagebrush canopy cover may surpass normal ranges found under the natural range of variation.

Browsing of low elevation Wyoming big and black sagebrush by domestic sheep occurs in the Green River Basin landscapes of the Ashley National Forest near Flaming Gorge Reservoir. Browsing intensity has not been heavy enough to induce a downward trend in canopy cover of these sagebrush taxa. Browsing of

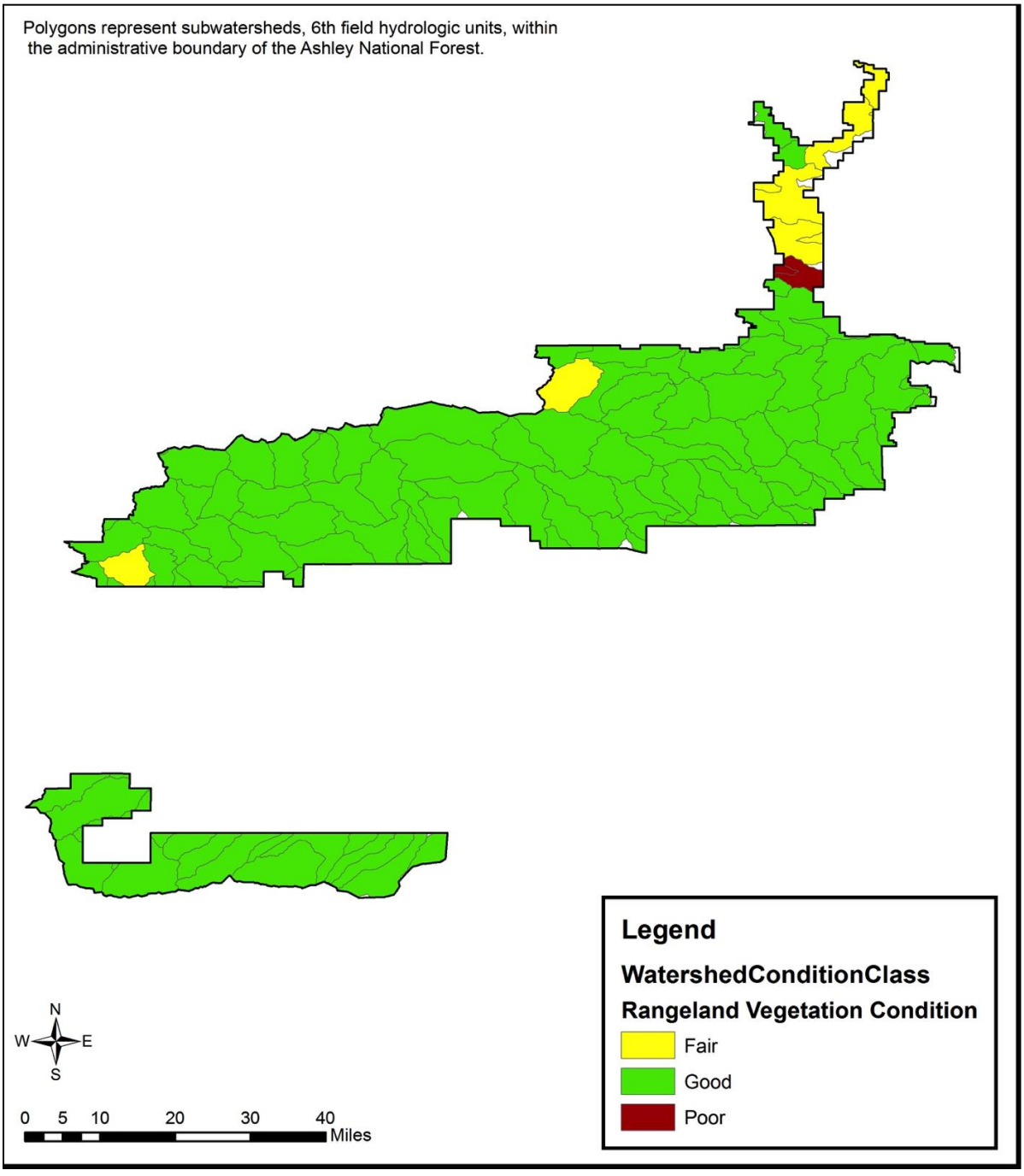
sagebrush by domestic sheep is not expected to increase during the next plan period.

In desert shrub communities, cattle and sheep grazing of the Green River Basin has remained relatively constant over the last 30 years and is expected to either remain constant in terms of numbers, time, and intensity or trend downward with additional loss of desert shrub communities from invasive annual displacements.

As invasive annuals alter composition of desert shrub communities, available forage for livestock will decrease. Invasive annuals are predicted to increase and further spread during the next plan period. Under this scenario, forage production is likely to decrease over the next 30 years.

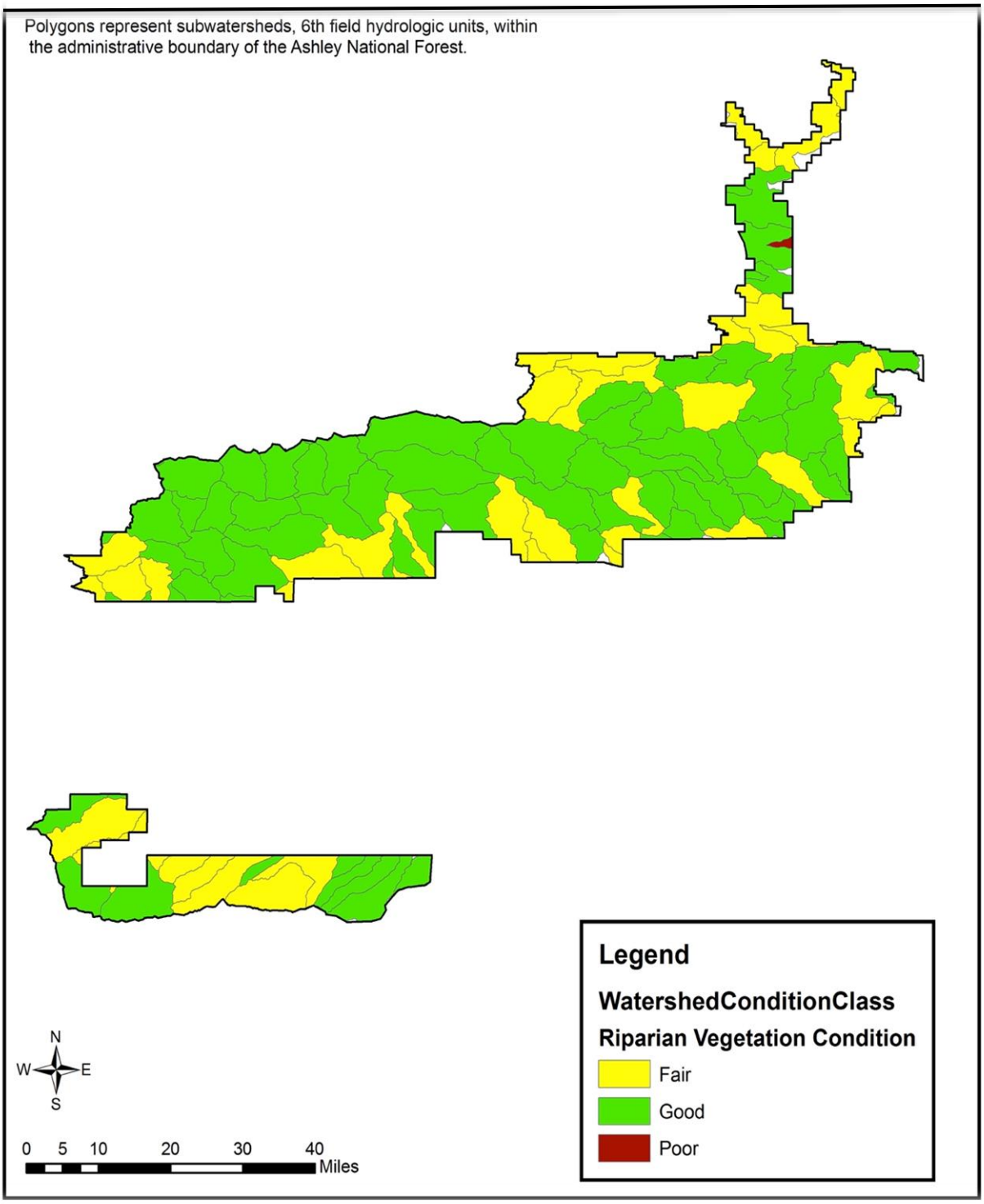
More quantitative information is available when rangeland condition is examined utilizing watershed condition data. Analysis of the Watershed Condition Class geodatabase at the sub-watershed level in 2011, found that 113 out of 123 sub-watersheds had rangelands in good condition. The exception was watersheds in the northernmost portion of the Ashley National Forest in the Wyoming portion of the Flaming Gorge Ranger District that had two watersheds rated as poor due the composition of cheatgrass and halogeten that have altered desert shrub communities and decreased forage production (see **Figure 4-4**, Rangeland Vegetation Conditions by Watershed in Ashley National Forest, 2011). For riparian vegetation conditions, 80 watersheds have good condition, see **Figure 4-5**, Riparian Conditions by Watershed in Ashley National Forest, 2011).

Figure 4-4
Rangeland Vegetation Conditions by Watershed in Ashley National Forest, 2011



Source: Forest Service 2016i

Figure 4-5
Riparian Conditions by Watershed in Ashley National Forest, 2011



Source: Forest Service 2016i

4.3.4 Rangeland Capability

Rangeland capability is the determination of the level of grazing that can be supported by available resources under an assumed set of management practices and at a given level of management intensity. A range capability analysis is not part of the plan revision process because land management planning at the Forest scale focuses on desired conditions rather than outputs. The Forest Plan will provide broad direction for the resource conditions to be achieved or maintained, but the appropriate level of grazing on a unit is best determined in individual allotment plans at the site-specific level (Fed. Reg. Vol. 77, No. 68, pp. 21168, 21221).

4.3.5 Risks, Stressors, and Drivers

The market demand for agricultural products impacts the price for livestock at market and the related economic contributions from this resource. The amount of grazing land and rangeland in the U.S. is expected to continue slowly declining over the next 50 years. This would be the case particularly in areas with more rapid population increases and concomitant appreciation in land values (Mitchell 2000).

Grazing capacity may also be impacted by rangeland conditions and forage availability, which are in turn influenced by the level and timing of precipitation. Should vegetation changes occur, grazing capacity would be impacted. Finally, the level of grazing is impacted by Forest Service management decisions, including acres available to grazing and those acres where grazing is excluded for the protection of other resources or to prioritize other resource uses.

4.3.6 Ecosystem Services

Economic, lifestyle, and benefits to forest health are described as important values associated with cattle and sheep grazing of these resources. Livestock grazing on the Ashley National Forest has an important role in both provisioning and cultural services. Based on input in the 2008 Beliefs and Values study (Russell 2008), agricultural heritage is of particular importance in the region. Commenters noted that oil and gas have always been up and down, but agriculture has been steady. Sustaining grazing is also perceived to offer benefits to the custom and culture of rural communities. The work ethic of ranching is believed to express fundamental American values that are embedded in the culture of the West. Ranching participants emphasize that rural values and lifestyles can be undermined by some management practices. In addition, commenters note that although most people who are in ranching or farming probably have a second job just because of the industry, there is a strong lifestyle value in being in agriculture, and that it affords the opportunity to teach children the value and benefit of hard work (Russell 2008).

4.3.7 Ecological Sustainability

Ecological integrity and sustainability are important parts of the grazing program today and dictate the level of authorized grazing. This management allows for productive lands that are capable of sustaining grazing and other multi-use

activities into the future and that will continue to be an important part of the local economy and culture. Feedback collected in the 2008 Beliefs and Values study (Russell 2008) noted the importance permitting grazing in locations with appropriate ecological and geographic characteristics and the necessity for monitoring that ensures ecological integrity.

4.3.8 Contributions of Use/Enjoyment to Economic Sustainability

Livestock grazing has been an important part of the local economy and culture for more than a century. In the 2008 Beliefs and Values study (Russell 2008), supporters of grazing emphasize that it provides benefits to forest health, wildlife, and open space, while also contributing to sustaining a valued lifestyle.

In addition, 85.7 percent of survey respondents in Daggett, Duchesne, and Uintah Counties feel that grazing livestock on public lands is important to the overall quality of life in their communities (Krannich 2008). In total, 53.4 percent of survey respondents in the three-county area agree that land managers should maintain about the same level of livestock grazing on public lands; 28.2 percent feel that livestock grazing could be increased to some extent.

As noted in **Section 3.2**, Overview of Market Conditions, there are 92 grazing permittees on the Ashley National Forest. The actual use levels of grazing on the Ashley National Forest supports approximately 127 jobs (in Daggett, Duchesne, Uintah, and Sweetwater counties), and the approximate labor income for grazing is $2.78 million. Most typical ranches depend only partially on federal land grazing for forage. However, economic studies have shown that this forage source can represent a critical part of their livestock operation, particularly as a summer forage source. Federal livestock grazing impacts livestock production and the viability of individual agricultural operations (Taylor et al. 2004). Grazing is likely to continue to represent an important economic sector for some communities and will help to maintain a traditional cultural setting.

4.3.9 Key Indicators

- Levels of permitted and actual use of grazing
- Rangeland conditions and sustainable forage production
- Employment and income for livestock grazing sector

4.3.10 Summary

Livestock grazing has been an important part of the local economy and culture for more than a century. Ecological integrity and sustainability are important parts of the grazing program today. They are principles that will allow for productive lands that are capable of sustaining grazing. Sustaining grazing at a level appropriate for the local setting will allow for grazing and ranching culture to continue to be an important part of the local economy and communities.

4.4 WATERSHED

This section summarizes the current types and level of use of water resources on the Ashley National Forest, and discusses the relationship between water uses and water quality and quantity. In addition, the influence on local economic and ecological sustainability are discussed. This section follows direction outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10– The Assessment, Section 13.34, Assessing Multiple Uses about the contribution of watersheds and water resources to social and economic sustainability. For additional information on water quality and quantity, refer to the Air, Soil, and Water Specialist Report.

4.4.1 Existing Forest Plan Direction

The 1986 Forest Plan (Forest Service 1986) contains direction for management of water resources, mostly in the form of goals, objectives, standards, and guidelines. Desired future conditions for water include requirements that:

- The quality of water yield will be consistent with current standards set by law
- That the water resource improvement and rehabilitation backlog of 1,031 acres will be completed by the year 2000
- That high mountain reservoirs that are replaced by other storage projects will be stabilized at optimum levels for fisheries and recreational use

Additional details are included in the Water, Air, and Soils Specialist Report (Forest Service 2017j).

4.4.2 Current Levels of Use and Types of Use

Water uses on the Ashley National Forest include non-consumptive and consumptive uses. Non-consumptive uses include use of water for recreational activities. Consumptive uses include the diversion of water for irrigation or domestic water use.

The amount and type of use for consumptive purposes is determined based on adjudicated water rights. When water rights are adjudicated (the process by which water rights are determined or decreed by a court of law), the purpose to which water is diverted is applied to a specific "beneficial use." Examples of uses include, but are not limited to, irrigation, stock watering, domestic (indoor residential), and commercial, industrial, and municipal. More recently, water rights include instream flow as a beneficial use. Water appropriated for instream flow is generally not diverted for consumptive use, but rather maintained in the natural watercourse to support aquatic wildlife.

The Ashley National Forest contains water rights in the states of Wyoming and Utah. Within the state of Utah, the Ashley National Forest possesses approximately 1,590 water rights. The beneficial uses are mainly for stock with

1,401 rights, 129 domestic rights, 41 irrigation rights, and 19 "other" rights. In Wyoming, the Ashley National Forest possesses approximately 12 domestic rights for use in recreational areas.

Fourteen pipelines for miscellaneous uses operate on the Ashley National Forest; two of the pipelines are used for electricity generation. A primary use for pipelines is irrigation; 32 irrigation pipelines or canals operate on the Ashely National Forest.

Dams on the Ashley National Forest provide storage for water for other uses, and provide opportunities for water-based recreational activities. There are 32 dams on the Ashley National Forest, with one dam planned to be decommissioned sometime in 2017. A summary of the location and main function of dams on the Ashley National Forest is included in **Table 4-5**, Current Dams on the Ashley National Forest by Main Function. The trend on the Ashley National Forest is for the decommissioning of dams, particularly those in wilderness, due to high management costs for operations and maintenance. In the past decade, approximately 13 dams in the wilderness area were stabilized, and their water rights were moved to a lower-elevation reservoir off of the Ashley National Forest.

Table 4-5
Current Dams on the Ashley National Forest by Main Function

District	Recreation	Irrigation	Hydropower	Multi-Use	Total
Flaming Gorge	6	1		1	8
Vernal		13		1	14
Roosevelt/Duchesne		8	1		9
Total	*6*	*22*	*1*	*2*	*31*

Note: One dam is scheduled for decommission and is not included in this table.
Source: Forest Service 2016j

According to Ashley National Forest inventory, 3,313 water sources are inventoried on the Ashley. The Ashley National Forest generates approximately one million acre-feet of water annually to streamflow and contributes a large but unmeasured quantity to multiple groundwater aquifers (see the Air, Soil, and Water Specialist Report for details, Forest Service 2017i).

The Ashley National Forest is also an important headwater source protection zone for multiple public drinking water systems. The Utah Department of Natural Resources, Division of Drinking Water has registered eight surface water and six groundwater-derived drinking systems with source protection zones on the Ashley National Forest, with five additional surface water systems sharing boundaries (along watershed divides where small slivers of land may overlap with the Forest boundary).

Recreational uses of Ashley National Forest waterways are discussed in **Section 4.1**, Recreation.

4.4.3 Watershed Condition and Trends

The Ashley National Forest is in the Green River drainage, a major tributary to the Colorado River. The Green River drainage begins at the Continental Divide, in the Wind River Range in west-central Wyoming, and joins the Colorado River in Canyonlands National Park in south-central Utah. The drainage includes the Upper Green River Basin and the Lower Green River Basin. These two sub-basins are divided by the Uinta Mountain Range, where most of the Ashley National Forest is located. The FGNRA is on the north side of the Uinta Mountain Range and in the south end of the Upper Green River Basin. The South Unit of the Ashley National Forest is in the Tavaputs Plateau. The Ashley National Forest lies in 10 sub-basins and 107 watersheds.

The Watershed Condition Framework is a comprehensive six-step approach for proactively implementing integrated restoration on priority watersheds on National Forests and grasslands. The classification uses a comprehensive set of four process categories, 12 indicators and 24 attributes that are surrogate variables representing ecological, hydrological, and geomorphic functions and processes that affect watershed condition.

Attributes of watersheds are examined and assigned a score.

- Class 1 or Good condition watersheds are functioning properly because they exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural potential condition
- Class 2 or Fair condition watersheds are functioning at-risk because they exhibit moderate geomorphic, hydrologic, and biotic integrity relative to their natural potential condition
- Class 3 or Poor condition watersheds are at impaired function because they exhibit low geomorphic, hydrologic, and biotic integrity relative to their natural potential condition

Scores were then aggregated by watershed and assigned an overall condition rating.

- Scores between 1.0 and 1.6 are properly functioning watersheds
- Scores between 1.7 and 2.2 are functioning at-risk watersheds
- Scores between 2.3 and 3.0 are impaired function watersheds

Overall, 57 (53 percent) of the 107 watersheds are functioning properly and 50 (47 percent) are functioning at risk; no watersheds have impaired function.

As discussed in the Air, Water, and Soil Specialist Report, factors influencing watershed condition and water quality, or with potential to increase water quality in the future on the Ashley National Forest, include the following:

- Domestic water, irrigation, and livestock developments impacting both surface and groundwater flow regimes and water quality
- Oil and gas activity
- Harvest of conifer vegetation affecting peak flows and altering channel function, as well as roading necessary for harvesting affecting sediment delivery
- Increased road, trail, and off-road vehicle use affecting sediment delivery
- Historical and present livestock use affecting stream channels, riparian areas, upland areas, and water quality
- Increasing use of all-terrain vehicles and other off-road vehicles increasing a disturbed area, with resultant effects on flow regimes and sediment delivery and transport
- Flood response and effects in recent severely burned areas
- Atmospheric deposition of nutrients, particularly nitrogen and phosphorus, and its effects on water chemistry and aquatic biota

4.4.4 Risks, Stressors, and Drivers

Conflicts between different consumptive uses of water and between consumptive and non-consumptive use influence water management on the Ashley National Forest. For example, in the 2008 Beliefs and Values study (Russell 2008), participants were concerned that water diversion may impact the ability to use the Flaming Gorge Reservoir for recreation. In addition, participants stated concerns that increased population growth can increase the demand for municipal water sources and put agricultural water needs at risk. Overall, commenters noted the importance of management of watersheds to maintain water quality and quantity, in light of resource uses and development occurring on and off the Ashley National Forest.

4.4.5 Ecosystem Services

Water can be viewed as falling within all four categories of ecosystem services. The Ashley National Forest provides water for consumptive use as a provisioning service. In addition, water availability for scenic and recreational benefit supports cultural services. Finally, the Ashley National Forest's role in maintaining clean water supplies falls under the regulating services umbrella. Water can be seen as one of the main supporting services that supports other Ashley resources. Sustaining water quality and quantity were seen as some of the most important values of the Ashley National Forest in the 2008 Beliefs and Values study (Russell 2008). A common theme about the management of watersheds is the concern about both water quality and water supply for Ashley National Forest health, as well as residential, agricultural, and recreational users.

4.4.6 Ecological Sustainability

Watersheds on the Ashley National Forest provide essential services in relation to Ashley and ecosystem health. Watershed health provides a basis for all aspects of ecological services associated with activities and qualities on and off Ashley National Forest lands.

4.4.7 Contributions of Use/Enjoyment to Economic Sustainability

Watersheds of the Ashley National Forest provide essential services to the agricultural community through irrigation water and recreational opportunities (for wildlife and water for boating). Ashley National Forest watersheds support municipal watersheds and indirectly support other resources, including timber resources.

A 2008 Utah survey (Krannich 2008) indicated the following:

- 87.7 percent of Daggett, Duchesne, and Uintah County respondents felt that having water resources from public lands to irrigate crops and pastures is very important to their quality of life.
- 82.7 percent indicated that it is very important to have such water resources to supply the water needs of homes and businesses.
- 73.2 percent indicated that it is very important to have such water resources provide habitat for fish and wildlife.
- 67.7 percent of respondents believed that public land managers should increase the extent to which development of water storage and delivery systems occur on public lands.

4.4.8 Key Indicators

- Water quality as measured in watershed assessments
- Water quantity based on ability to meet appropriated water rights
- The number of dams and water distribution systems

4.4.9 Summary

Watersheds of the Ashley National Forest provide essential services to the agricultural community through irrigation water, support recreational opportunities (for wildlife and water for boating), and provide essential services in relation to forest and ecosystem health. Watershed health provides a basis for all aspects of ecological services associated with activities and qualities on and off forest service lands.

4.5 FISH, WILDLIFE, AND PLANTS

This assessment considers multiple uses related to fish, wildlife, and plants, and follows direction outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessment, Section 13.35, Assessing Multiple Uses for fish, wildlife, and plants. This discussion is limited to wildlife species that are commonly hunted or are special interest species. Additional information on

wildlife habitat is included in the Terrestrial Ecosystems Report (Forest Service 2017h) and Aquatic Ecosystems Report (Forest Service 2017k). Information on special interest species is included in the Species of Conservation Concern Report (Forest Service 2017l).

4.5.1 Existing Forest Plan Direction

The Forest Plan (Forest Service 1986) divides the Ashley National Forest into 14 management areas, each with different management prescriptions. Wildlife habitat emphasis areas include:

- Portions of summer and winter ranges
- Threatened, endangered, and sensitive species habitat
- Strutting areas
- Calving and fawning areas
- Spawning areas in timbered and non-timbered analysis areas

In these management areas, key areas are protected to maintain their functionality for wildlife, and these areas receive priority for wildlife improvement dollars. Limitations on resource uses such as recreation, range, timber, and mineral extraction are put in place on a site-specific and seasonal basis to protect wildlife.

4.5.2 Current Use and Existing Condition and Trends

Plants and animals of importance for the Ashley National Forest include those used by the public for hunting, fishing, trapping, gathering, observing, or sustenance, including cultural or tribal uses. Of visitors to the Ashley National Forest in 2012, approximately 49 percent participated in wildlife viewing, 30 percent in fishing, and 13 percent in hunting (Forest Service 2012).

In addition, the preservation of special status species may represent an important nonmarket value for some visitors and area residents.

Information on species and groups of wildlife on the Ashley National Forest is included below. Populations of game species, both fish and wildlife, are managed by the Utah Department of Natural Resources, Division of Wildlife Resources (UDWR). Many of these species' ranges cross state lines into Wyoming and Colorado. Where they do, they are also managed by the Wyoming Game and Fish Department or Colorado Parks and Wildlife, as applicable. The states provide hunting and fishing permits, stock water bodies, and provide predator control to meet management objectives. Forest Service habitat management is a contributing factor to meeting those objectives.

In general, wildlife on the Ashley National Forest is diverse, with strong populations of big game, such as elk, moose, deer, and other nongame species (Russell 2008).

Game Species

The Ashley National Forest is known to provide a high-quality hunting experience for a variety of game. The Ashley is popular with both locals and visitors, who hire outfitters for hunting (Russell 2008).

Big Game

Table 4-6, Existing Conditions and Trends for Big Game Found on the Forest, describes the conditions and trends in the plan area associated with big game species and their uses.

Upland Game

Table 4-7, Existing Conditions and Trends for Upland Game Found on the Forest, describes the conditions and trends in the plan area associated with upland game species and their uses.

Other Wildlife Species

The UDWR also regulates waterfowl hunting, including hunting for swan, Wilson's snipe, duck, merganser, coot, and dark and light geese. Furbearers requiring a license to harvest in Utah include badger, bobcat, beaver, gray fox, kit fox, mink, marten, ringtail, spotted skunk, and weasel. Species that can be harvested year-round without a license include coyote, muskrat, red fox, raccoon, and striped skunk. It is prohibited to take black-footed ferret, fisher, lynx, river otter, wolf, and wolverine. The estimated economic value of Utah's furbearer harvest from 2013 to 2014 was more than $594,000 (UDWR 2016i). Between 2006 and 2016, the species with the largest number of individuals harvested statewide were muskrat, coyote, raccoon, skunk, and red fox (UDWR 2016i).

Sports Fisheries

The Ashley National Forest is important as a sport fishery. Flaming Gorge Reservoir and the Green River in particular receive much visitation. Sports fisheries are described in further detail below.

Flaming Gorge Reservoir

Flaming Gorge Reservoir was created in 1962, with the completion of the Flaming Gorge Dam on the Green River. The dam was created as part of the Colorado River storage project to provide water storage and hydroelectricity. The reservoir is managed by the Forest Service as part of the FGNRA. The reservoir is 91 miles long, with 350 miles of shoreline (Forest Service 2016j).

Flaming Gorge offers world-famous fishing. World record trout have been caught in these cold waters. There are numerous fishing derbies throughout the summer season, and ice fishing is popular during the winter months. UDWR lists Flaming Gorge Reservoir as a "Blue Ribbon" fishing area, meaning it is considered to be one of the best fishing areas in the state.

Table 4-6
Existing Conditions and Trends for Big Game Found on the Forest

Big Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
Pronghorn	North Slope, Three Corners/West Daggett–Buck South Slope, Vernal–Buck South Slope, Diamond Mountain–Buck Nine Mile, Anthro-Myton Bench–Buck	In some areas, pronghorn habitat is limited by a lack of succulent forbs and grasses on spring/summer ranges, due to maturing sagebrush habitat. Certain types of fences are total barriers to movement of pronghorn between seasonal ranges and water and feeding areas (UDWR 2009a).	For the North Slope unit, population is estimated at 800, and five- and 10-year population trends are increasing. For the South Slope unit, population is estimated at 300; five- and 10-year population trends are increasing and decreasing, respectively. For the Nine Mile unit, population is estimated at 325, and five- and 10-year population trends are decreasing (UDWR 2009a). Predation can limit recruitment, but it is likely dependent on many other factors such as habitat quality and water availability (UDWR 2009a).
Moose	North Slope, Three Corners/West Daggett–Bull South Slope, Yellowstone–Bull South Slope, Diamond Mountain/Vernal–Bull Wasatch Mountains–Bull	A primary limiting factor for moose across Utah is habitat availability. Habitat can be degraded, fragmented, or lost to a variety of causes, including human development and plant succession. Habitat improvement projects that favor early seral stages and increased shrub growth can be very beneficial to moose. The use of fire can also be used to dramatically improve moose habitat (UDWR 2009b).	Moose are generally tolerant and less afraid of humans than other wild ungulates, which results in frequent interaction. Though moose rarely cause serious problems, these moose should be captured and relocated. Infrequent moose-auto collisions can result in mortality and loss of human life and property (UDWR 2009b). For the North Slope unit, population is estimated at 147; slightly decreasing in three year trends (UDWR 2011a). For the South Slope, Yellowstone unit, population is estimated at 92, and for the South Slope, Diamond Mountain/Vernal unit, population is estimated at 41, both units are decreasing in five year trends (UDWR 2011b). For the Wasatch unit, population is estimated at 65 based on 2009 data; five- and 10-year population trends are stable (UDWR 2009b).

Table 4-6
Existing Conditions and Trends for Big Game Found on the Forest

Big Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
Mule deer	Deer herd unit (DHU) #8, North Slope DHU #9, South Slope, Yellowstone and Bonanza/Vernal subunits DHU #11, Nine Mile, Anthro subunit DHU #17, Wasatch Mountains	DHU 8 contains summer range and winter range. Winter range conditions were good to excellent between 1995 and 2015 (UDWR 2016a). DHU 9 contains summer and winter range, and conditions vary from very poor to excellent. Some areas have been affected by fire or drought and are recovering very slowly or not at all (UDWR 2012b). DHU 11 contains winter range in good to excellent condition (UDWR 2012c). DHU 17 contains winter range in fair to excellent condition (UDWR 2012d).	The North Slope unit is currently below state population objectives (UDWR 2017). The overall range trend is good. Some areas have suffered a sagebrush die-off, primarily due to the extended drought (UDWR 2016a 2014). The South Slope unit is currently below but trending towards state population objectives (UDWR 2017). The overall condition of the unit is declining slightly. The most critical winter range areas are currently in fair-poor condition as, reflective of the sagebrush die-off that occurred in 2003. These low-potential sites are critical during hard winters (UDWR 2016b). The Nine Mile unit has population levels below state population objectives (UDWR 2017). All of the Range Trend study sites were considered to be in good condition as of the 2015 sample year. Deer winter range has shown improvement from 2005 to 2015 (UDWR 2016c). The Wasatch Mountains Unit population levels below b state objectives for all sub-units (UDWR 2017). Range trend varies depending upon the site ecological potential. Winter range condition was considered to be in very poor to good condition as of the 2015 sampling year. Winter range is the critical habitat factor on these subunits. (UDWR 20126d).

Table 4-6
Existing Conditions and Trends for Big Game Found on the Forest

Big Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
Rocky Mountain Elk	North Slope –Three Corners North Slope- Summit/West Daggett South Slope Bonanza/Vernal/Yellowstone– Nine Mile–Anthro Wasatch Mountains	Elk habitat is continually being fragmented or lost due to human expansion and development. Elk summer range, such as aspen habitat, has been gradually replaced by conifers due to fire suppression, and winter ranges that were once dominated with shrubs and perennial grasses have been replaced by annual grasses or invasive weeds that are not beneficial to elk (UDWR 2015a).	Population in the North Slope unit is above state population objectives in Summit and West Daggett sub-unit and below in Three Corner sub-unit (UDWR 2017). The overall range trend within the North Slope unit is good. Some areas have suffered a sagebrush die-off, primarily due to the extended drought (UDWR 2016e). Population in the South Slope Yellowstone sub-unit is above state objectives, while the Diamond/Mt Vernal sub-unit is below, likely due to the high number of antlerless permits issued over the past two years (UDWR 2017). In 2015, the browse and herbaceous understory components in the unit showed some improvement since the 2003 drought related sagebrush die off. However, the most crucial winter range areas are currently only in fair condition, and there are several critical winter range sites in the Vernal subunit that are in poor or very poor condition (UDWR 2016f). Population in the Nine Mile unit is above and state population objectives (UDWR 2017). Condition trends for summer and high-elevation winter ranges appear to be stable (UDWR 20126g). Population trends are at or below state objective levels in all three Wasatch Mountains sub-units, likely do to the issuance of antlerless permits to reduce the population (UDWR

Table 4-6
Existing Conditions and Trends for Big Game Found on the Forest

Big Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
			2017). Overall conditions are good. Some wintering areas suffered a sagebrush die-off due to the seven-year drought that ended in late 2004. Since 2005 there have been several wet years, which resulted in good grass production. The majority of the Range Trend monitoring sites on this unit are in fair to good condition (UDWR 2016h). Chronic wasting disease has been found in the North Slope and South Slope units near Flaming Gorge and Brush Creek. The UDWR and their partners have treated over 650,000 acres of elk habitat since 2005. There are no known instances of predators causing elk herd declines in Utah (UDWR 2015a).
Rocky Mountain Bighorn sheep	North Slope, West Daggett (Uintas) Wasatch Mountains, Avintaquin	Bighorn habitat can be degraded, fragmented, or lost to a variety of causes, including human disturbance, mineral development, and natural succession. Human disturbance in bighorn sheep habitat is an increasing concern in many areas of Utah. Those disturbances include outdoor recreational activities, such as off-road vehicle use, mountain biking, river running, and others. Pinyon-juniper expansion has fragmented large expanses of otherwise suitable habitat (UDWR 2013a).	Within the planning area, the Uintas and Avintaquin populations both have decreasing population trends. However, the populations are still considered large enough by the state of Utah to withstand harvest of a few rams a year. Parasites and diseases are a major concern for bighorn sheep management in Utah. Parasites, such as those that cause Psoroptic mange, and respiratory diseases, such as those caused by Pasteurellosis, have resulted in large-scale population declines in short periods of time. Predation by mountain lion can be a serious limiting factor to bighorn sheep herd establishment or expansion (UDWR 2013a).

Table 4-6
Existing Conditions and Trends for Big Game Found on the Forest

Big Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
			Recommendations to limit impacts of bighorn and domestic sheep interactions are provided by the Western Association of Fish and Wildlife Agencies Wild Sheep Working Group (2012).
Mountain goat	North Slope/South Slope, High Uintas West North Slope/South Slope, High Uintas Central North Slope/South Slope, High Uintas East North Slope/South Slope, High Uintas Leidy Peak Kamas/Chalk Creek	Given the fragile nature of alpine habitats, mountain goat utilization of the available forage must be closely monitored. In addition to their direct utilization of forage, the creation of dust bowls by mountain goats has been identified as a potential habitat concern, but this is considered normal behavior (UDWR 2013b).	All populations in Utah are the result of introductions, the first of which occurred in 1967. (UDWR 2013b). Trend count data for Uinta units shows large variations in population by unit from 2001-2014, with an overall trend towards an increase in population in the high Uintas (UDWR 2014a). Little information is available relative to disease in mountain goats. However, there are some documented occurrences of disease that may be of concern for mountain goats in Utah, including contagious ecthyma, Johnes disease, and respiratory pneumonia. Predation does not seem to be a limiting factor to mountain goat population growth in Utah (UDWR 2013b).
Mountain lion (cougar)	North Slope, Three Corners North Slope, Summit/West Daggett South Slope, Yellowstone South Slope, Bonanza/Diamond Mountain/Vernal Either sex for all	Residential and commercial development on private lands near the Ashley National Forest is incrementally reducing cougar distribution through habitat alteration and destruction (UDWR 2015b).	Statewide population estimates range from 2,500 to 3,900. Cougar populations may be limited by prey abundance, availability, and vulnerability (UDWR 2015b).

Table 4-6
Existing Conditions and Trends for Big Game Found on the Forest

Big Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
Black bear	North Slope, Three Corners/West Daggett South Slope, Yellowstone South Slope, Bonanza/Diamond Mountain Wasatch Mountains, Avintaquin/Currant Creek Nine Mile	Aspen stands are likely the important Forest community in Utah, providing both cover and food. Successional replacement of aspen stands by conifers can significantly reduce bear food production in aspen communities. Large-scale logging may be detrimental to bear habitat. Human contact due to recreation and development within bear habitat leads to bear habituation and conflict (UDWR 2011c).	Utah's black bear population appears to have increased since 1990. Results of population reconstruction for Utah bears suggest the bear population from 2000 to 2006 may have stabilized (UDWR 2011c).

Source: Cited in table

Table 4-7
Existing Conditions and Trends for Upland Game Found on the Forest

Upland Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
White-tailed ptarmigan	Uinta Mountains	High-elevation willow vegetation comprises both wintering and breeding habitat (UDWR no date).	Seventy-seven white-tailed ptarmigan were introduced into the Uinta Mountains in 1976. Birds now may be found in Garfield Basin, Yellowstone Basin, Gilbert Basin, Atwood Basin, Beaver Basin, Rainbow Basin, and in Smith's Fork, Rock Creek, Black's Fork, Henry's Fork, and Lake Fork drainages. Ptarmigan are believed to be distributed from Deadhorse Pass on the west to Leidy Peak on the east (UDWR no date).
Forest grouse (ruffed and dusky)	N/A	Aspen stands and higher-elevation aspen stands transitioning to conifer forest.	UDWR does not conduct formal surveys for Forest grouse. In 2014 (the most recent year data are available), approximately 2,400 grouse were taken in UDWR's Northeast region (UDWR 2015e).
Wild turkey	N/A	Loss of riparian habitats could potentially reduce suitable wild turkey habitat (UDWR 2014b).	No detailed habitat inventories have been conducted to assess historical trends in turkey habitat throughout Utah; UDWR does not conduct population surveys. However, hunting statistics suggest a population of 18,000 to 25,000 statewide. Annual weather conditions have the greatest impact on Utah's wild turkey populations. Disease and predation may also affect wild turkey populations (UDWR 2014b).
Chukar	N/A	Chukar is losing habitat due to urbanization on adjacent private lands and sagebrush conversion. Habitat conversion to areas dominated by annual invasive grasses provides reduced habitat quality for chukar	Chukar Partridge were first introduced into Utah in 1935, and continuing introduction of pen-raised and wild-trapped birds have intermittently continued to the present. Well over 300,000 birds have been released to date. For the most part, Chukar Partridge have done well in Utah, but they have periodically experienced significant localized

Table 4-7
Existing Conditions and Trends for Upland Game Found on the Forest

Upland Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
		(UDWR 2003).	or general population declines due to severe winters or drought (UDWR 2003).
Greater sage-grouse	Mapped occupied habitat overlapping the Forest includes the Carbon (Tavaputs, Anthro, Emma Park, Schofield, Gordon Creek, and Sanpete units), Lucerne, Uintah (Diamond Mountain) and Wyoming-Black Fork population areas (BLM and Forest Service 2015). The state identified the Uintah Sage-grouse Management Area (UDWR 2013c).	Carbon: Approximately 66 percent of sagebrush in the area is in mid- to late-seral classes, which are usually reflective of between 10 and 30 percent sagebrush cover, providing habitat that best meets GRSG habitat guidelines (BLM and Forest Service 2015). Lucerne–There is currently 0.5 percent disturbance in GRSG habitat in the Lucerne Population Area. There is no history of fire in GRSG habitat in this area (BLM and Forest Service 2015). The Uinta (Diamond Mountain) area has roads (mostly small gravel roads), two pipelines, power lines (transmission and distribution), and a pipeline compressor station spread across this area. Disturbances to this population are relatively minimal (BLM and Forest Service 2015).	Carbon-Habitat modeling indicates that the preferred level of sagebrush cover in the area will decrease from 80 to 76 percent in 10 years and continue to decrease to around 67 percent at 50 years due to increases in annual grasses and conifer encroachment. Oil and gas and other anthropogenic disturbances continue to be a threat in the Anthro unit (BLM and Forest Service 2015). Lucerne-There are long-term downward trends due to annual grasses and conifer encroachment (BLM and Forest Service 2015). Wyoming-Black Fork- 88 of the 102 unoccupied leks have been abandoned and 14 others destroyed. Current data indicate that approximately 80 percent of this unit contains habitat that best meets GRSG habitat guidelines (i.e. mid-late seral classes with 10 and 30 percent sagebrush cover). Modeling of the existing habitat trends indicates that this habitat is likely to decrease to 76 percent within 10 years and 67 percent in 50 years due to increases in annual grasses and conifer encroachment (BLM and Forest Service 2015). The 10-year average for males counted at leks in the Uintah Sage-grouse Management Area is 452, with a 10-year maximum and minimum of 822 and 238, respectively (UDWR 2013c).

Table 4-7
Existing Conditions and Trends for Upland Game Found on the Forest

Upland Game	Baseline Information for Species/Groups	Habitat Condition	Trends, Issues, and Concerns
		Wyoming Black-Fork– approximately 80 percent of sagebrush is in mid- to late-seral classes, which are reflective of between 10 and 30 percent sagebrush cover, providing habitat that best meets GRSG habitat guidelines (BLM and Forest Service 2015).	Region-wide management direction was provided in the Utah Sub-regional Greater Sage-Grouse Land Use Plan Amendment (BLM and Forest Service 2015).

Sources: Cited in table

Fisheries available at Flaming Gorge Reservoir include brown trout, channel catfish, crawfish, Kokanee salmon, Mackinaw (lake trout), rainbow trout, and smallmouth bass (Utah Fish Finder 2016; UDWR 2015c). Burbot, a nonnative, is also present. Its expanding population is threatening brown trout and other sports fisheries (Gardunio et al. 2011).

The reservoir is also very popular for ice fishing, which is an important source of recreation income in the winter months.

Green River

Located below Flaming Gorge Dam, this 35-mile-long tail water fishery extends all the way to the Colorado border. Anglers can float the river in dories, rafts, or kick boats. There is also foot access to the river from the Little Hole National Recreation Trail, which runs between the Spillway and Little Hole boat launch sites (Forest Service 2016j). The area provides breathtaking glimpses of canyon and high desert habitats. Water levels fluctuate daily in the Green River, due to controlled discharges at Flaming Gorge Dam (UDWR 2015c). Fisheries available at the Green River are brook trout, brown trout, channel catfish, cutthroat trout, northern pike, rainbow trout (Utah Fish Finder 2016), and mountain whitefish (UDWR 2015c).

Other Fishing Opportunities

There are more than 1,000 natural lakes in the Uinta Mountains, and more than 500 of them support populations of game fish. There are also more than 400 miles of streams. Fly fishing in the summer and fall months offers some of the fastest catch rates for trout in the state. Standard baits are also effective. The UDWR provides fishing reports for a number of lakes on the Ashley National Forest, including Spirit Lake, Sheep Creek Lake, Browne Lake, Long Park Reservoir, Moose Pond, and East Park Reservoir (UDWR 2015d).

Watchable Wildlife

Given the diversity of fish and wildlife on the Ashley National Forest, there are great opportunities for wildlife viewing and for fishing. The UDWR has organized multiple, diverse, watchable wildlife events in the past, some of which are ongoing annual events. In addition to the organized events, visitors can experience self-directed watchable wildlife opportunities provided by an abundance of big game species like moose, bighorn sheep, deer, elk, and mountain goats. Watchable wildlife events - held in cooperation with the UDWR- include Bald Eagle Day, Kokanee Day, Osprey Watch, Loon Watch, and Mountain Goat Watch. The events have attracted approximately 685 to 1,100 visitors per year. The Wildlife and Rivers Festival, held in 2005, attracted 500 to 600 visitors alone, but has not been held in subsequent years due to lack of organizational funding and staff. Other watchable wildlife events - organized by the UDWR - have included watches for bighorn sheep, sandhill cranes, greater sage-grouse, deer, and elk.

Plants and Wildlife with Cultural Value

As documented in the Tribal Specialist Report, numerous plants have tribal importance for the Ute people, such as ponderosa and pinyon pines, sweet grass, sagebrush, dandelion, and gooseberries. These plants have been traditionally used for medicinal, ceremonial, food, and utilitarian purposes. For example, Ute groups peeled ponderosa pine trees for food and other implements, such as cradle boards and saddle parts. Sweet grass has been collected near Lower Stillwater in McAfee Basin, and lodgepole pine was collected in the Red Cloud loop above Brownie Canyon (see Tribal Specialist Report for additional details, Forest Service 2017c).

Special Status Species

A part of revising a National Forest management plan is to identify federally protected threatened, endangered, proposed, and candidate species that reside in or have suitable habitat on the planning unit. The responsibility the Forest Service has for threatened and endangered species is to work with U.S. Department of the Interior, Fish and Wildlife Service, as well as other partners, such as state wildlife agencies, to help in the recovery of these species. Similarly, the primary goal for proposed and candidate species is to conserve these species and their habitat to ensure management actions do not threaten these species, such that they become listed as threatened or endangered. The list of federally protected threatened, endangered, proposed, and candidate species are determined and maintained by U.S. Department of the Interior, Fish and Wildlife Service on a regional basis. For the Ashley National Forest, these lists are managed by the Ecological Services Office in Salt Lake City, Utah. There are nine federally protected threatened, endangered, proposed, and candidate species (eight fish and wildlife species, and one plant species) considered in the plan revision.

In addition to the federally protected species, the Forest Service identifies species of conservation concern (SCC). SCC are species other than federally recognized threatened, endangered, proposed, or candidate species that may be lower in numbers or have been trending downward due to various factors. Therefore, the agency ensures management actions do not impact these species or their habitat, and that viable populations are maintained.

The original lists of SCC to consider were generated by the Forest Service's Region 4 Office. These lists consisted of 96 animal and 81 plant species as potential SCC for the Ashley National Forest. In determining which SCC would be carried forward, the Forest Service considered a host of evaluation factors, including, but not limited to:

- Global and state status
- Documented occurrences in the planning unit
- Establishment

- Distribution
- Abundance trends
- Threats and risks
- Other species-specific concerns

The Forest Service has currently identified six fish and wildlife potential SCC, and 17 plant potential SCC.

Detailed information on habitat conditions and trends, and ecological and human-related stressors for both federally protected threatened, endangered, proposed, and candidate species and SCCs are given in the Species of Conservation Concern Specialist Report for the Forest (Forest Service 2017k).

4.5.3 Risks, Stressors, and Drivers

There are a variety of risk factors that impact land and resource conditions and the ability to meet plan objectives, some of which are beyond the control of Forest Service management. For fish, wildlife, and plant management, drivers are dominant ecological processes. Stressors may result in an imbalance of ecological processes. Drivers and stressors are closely related and have direct influence and feedback mechanisms with ecosystem structure and function. Drivers and stressors that influence fish, wildlife, and plant management within the socioeconomic planning area include:

- Disturbance regimes–wildfire and wildland fire, vegetation succession, and anthropomorphic disturbance
- The effects of climate change
- Nonnative plant and wildlife species invasions

4.5.4 Ecosystem Services

The ability to hunt wildlife on the Ashley National Forest represents an important provisioning and cultural service for area residents who have historical ties to this use. In addition, the presence of habitat to support wildlife allows for wildlife viewing and other recreational experiences that represent the cultural services offered by this resource. Maintaining habitat for federally protected threatened, endangered, proposed, and candidate species and SCC supports the ability of these species to survive. Species survival can itself have inherent value for some people, whether or not they experience seeing it, as discussed in **Section 3.3.2**, Cultural Services.

4.5.5 Ecological Sustainability

There is no published information concerning the potential impacts of hunting, fishing, or wildlife viewing on ecological integrity and species diversity locally. However, there is an increasing trend in all forms of recreational use on the Ashley National Forest, including a rising demand for hunting and fishing, which is expected to continue in the future.

Hunting and fishing license quotas are set by UDWR and are guided by multi-year statewide and unit-specific management plans. Many hunting license quotas are limited by UDWR. Therefore, the quotas are not expected to increase much in the future, if at all.

Many hunters camp on the Ashley National Forest, in both developed campgrounds and undeveloped sites, often along streams or other sensitive areas. There is also an increasing trend in the number of hunters incorporating all-terrain vehicles and utility terrain vehicles into their activities. Because of increased motorized use, it is likely that hunting activities are impacting habitat integrity and habitat use for some wildlife species.

Fishing is also a very popular recreational activity on the Ashley National Forest. Currently, there are no limitations on the number of fishing licenses. Users distribute their activities based on their preferences and abilities toward concentrated use areas or more secluded recreational settings. By the nature of this activity, Ashley National Forest users are attracted to and often concentrate along sensitive streamside zones and lakesides. It is likely that the ecological integrity of known high-use fishing areas is affected. Of particular concern may be impacts on high alpine lakes and stream zones. Existing management direction for these areas should be evaluated to identify trends in use and impacts.

4.5.6 Contributions of Use/Enjoyment to Economic Sustainability

As discussed in **Section 3.2.6**, tourism and recreation are important contributors to the economy in the socioeconomic planning area. Wildlife- and fish-associated recreation on the Ashley National Forest contributed an estimated 34 jobs and $1,141,000 in labor income in 2014. Preservation of wildlife habitat and managing this resource for sustained populations supports continued economic contributions from this resource.

In addition, 89.5 percent of survey respondents in Daggett, Duchesne, and Uintah Counties indicate that maintaining trees and vegetation for wildlife habitat on public lands is moderately or very important to the overall quality of life (Krannich 2008).

4.5.7 Key Indicators

- Acres of habitat, stream miles, and habitat quality for key economic species to support desired population levels
- Acres of habitat stream miles, and habitat quality for federally protected threatened, endangered, proposed, and candidate species and SCC
- Employment and income related to wildlife recreation

4.5.8 Summary

Consumptive and non-consumptive uses of fish and wildfire resources are an important social, economic, and cultural tradition on the Ashley National Forest. The highest and most concentrated use is likely recreational hunting and fishing. These activities not only contribute substantially to the local economy, but also to the culture of the surrounding communities. Wildlife viewing also represents an important form of recreational use. Once user traditions are established, many users return to the Ashley National Forest regularly because of the unique opportunities associated with fish and wildlife resources and the local scenic environment associated which the pursuit of these activities.

Maintenance and enhancement of habitat supports the continued presence of fish and wildlife for recreation opportunities. In addition, preservation of special status wildlife for the future represents an important non-use value.

4.6 ENERGY AND MINERALS

This section includes analysis of the contribution of renewable and nonrenewable energy and mineral resources to social and economic sustainability, and follows direction outlined in FSH 1909.12, Land Management Planning Handbook, Chapter 10–The Assessment, Section 13.5, Assessing Renewable and Nonrenewable Energy Resources, Mineral Resources, and Geologic Hazards. Additional information is provided in the Minerals and Energy Specialist Report (Forest Service 2017d).

In many parts of the U.S., National Forest System lands overlie geologic formations that contain oil or natural gas. "Leases" are offered under the mineral leasing laws for many of the lands for the purpose of drilling exploratory wells and extracting oil and/or gas. The mission of the Forest Service in relation to minerals management is to support, facilitate, and administer the orderly exploration, development, and production of mineral and energy resources on National Forest System lands to help meet the present and future energy needs of the nation.

On the Ashley National Forest, the Forest Service manages mineral resources to provide orderly exploration, development, and production of mineral and energy resources consistent with the use and protection of the other resource values. However, mineral development on Forest Service lands can exclude other uses. For example, if there is mineral development going on in an area, it is not as attractive to recreational users as areas that would not have such use. Mineral development requires aboveground equipment and machinery. As noted in **Section 2.11**, Communities of Interest, recreational users and conservation-minded individuals or groups likely prefer more natural settings when using the Forest.

4.6.1 Existing Forest Plan Direction

Much of the direction for mineral development is governed by, decided, and prescribed at or above the agency level, such that additional restrictions or

directions at the Ashley National Forest and Forest planning level are either duplicative or potentially in conflict with existing laws and regulations, or might conflict with valid existing rights held by the mining claim or mineral lease holders.

4.6.2 Current Levels of and Type of Use

Renewable and nonrenewable energy development occur on the Ashley National Forest. Currently, renewable energy on the Ashley National Forest is limited to hydropower. The Flaming Gorge Dam, operated by the U.S. Department of the Interior, Bureau of Reclamation, and located in the Flaming Gorge District of the Ashley National Forest, generates large amounts of renewable energy (approximately 344,369,000 kilowatt-hours per year).

Very small hydropower operations also exist at Yellowstone Lake and in Uinta Canyon. The Yellowstone area plant is on private lands, and the Uinta Canyon facility is on tribal lands. Both are run by Moon Lake Electric cooperative and use water from the Ashley National Forest. Due to the large topographic variations across the Ashley National Forest, additional opportunities for hydropower generation certainly exist, but the undeveloped rivers tend to be small. The amount of hydropower potentially available is also small relative to other potential sources.

Oil and gas wells in the Roosevelt-Duchesne District have potential for production of geothermal energy, once those wells are no longer productive for oil and natural gas. Nonrenewable energy development on the Ashley National Forest consists of oil and natural gas (currently 160 oil and gas wells on 51 well pads), coal (currently minimal development on the Ashley National Forest), tar sands (currently several deposits), oil shale (in the South Unit portion of the Ashley National Forest), and low-grade geothermal energy resources. In the Uinta Basin, in which the Ashley National Forest is located, oil and gas is the principal player.

Locatable mineral development on the Ashley National Forest includes three active mines and three exploratory drilling projects. See the Energy and Minerals Specialist Report (Forest Service 2017d) for more detailed information about the level of mineral and energy development on the Ashley National Forest and the locations of existing activity. The Ashley National Forest is also available for salable mineral development. While salable mineral development has occurred in the past, there are currently no public projects underway that require or are using salable minerals from the Ashley National Forest.

4.6.3 Existing Condition and Trends

Hydropower installations on the Ashley National Forest provide more renewable energy than any other renewable energy source. Because other forms of renewable energy are more abundant and more easily extracted elsewhere, they are not sought out for development on the Ashley National Forest.

As described in detail in the Energy and Minerals Specialist Report (Forest Service 2017d) the Ashley National Forest currently has 160 wells. Approximately 50 additional oil and gas wells have been approved for development, but have not yet been drilled. In addition, an existing Master Development Plan includes an additional 200 wells that have not yet been approved or evaluated in site-specific detail. Whether or not these additional wells will be approved or drilled, depends on the preferences of leaseholders of Linn Energy and Vantage Energy, as well as future market prices and demand for crude oil and natural gas. Much of the South Unit has good potential for oil and gas resources, including large areas that are not currently subject to oil and gas leases. A new oil and gas leasing analysis will be needed for future oil and gas leasing, both to determine areas of the Ashley National Forest to be made available for leasing, and to determine the appropriate lease stipulations to be applied to future leases.

In addition, a portion of the Whiterocks Tar Sand deposit, located on adjacent private lands, has been mined to produce natural asphalt for paving local roads. The deposit appears to continue onto the Ashley National Forest, but has not yet been leased for exploration or development. Although widespread, the known oil shale deposits within the Ashley National Forest are relatively thin and impure, compared with the much thicker and richer oil shale deposits on BLM-administered lands near Bonanza and the White River Gorge in Utah.

It is anticipated that there is no potential for economic development of coal due to the small size of the individual deposits. There are known deposits of trona and other sodium minerals. All active mining operations for trona lie outside the Ashley National Forest, but there is an active 40-acre sodium mineral lease on the Forest; not expected that sodium leases or subsurface mining operations will extend onto the Ashley National Forest. There are currently no active phosphate leases on the Ashley National Forest, but the BLM and Ashley have received several requests for phosphate leasing on the Ashley National Forest in recent years. For additional details, see the Energy and Minerals Specialist Report (Forest Service 2017d).

The scale and nature of locatable minerals exploration, development, and ongoing production of the locatable minerals known or likely to be found on the Ashley National Forest, as well as the scale of management of such activities, is largely dependent on and driven by changes in market prices and industry interest.

As no large increases or decreases in construction or maintenance of Ashley National Forest Service facilities is envisioned, saleable minerals production is likely to remain stable.

4.6.4 Risks, Stressors, and Drivers

The level of mineral development is largely driven by market factors. The recent oil and gas boom and bust period experienced in the socioeconomic planning

area provides one example of the impact of market factors on development, jobs, and related economic conditions. The level of development on the Ashley National Forest is low relative to the development on adjacent BLM-administered lands, private lands, and tribal lands.

4.6.5 Ecosystem Services

Oil and gas development is recognized as representing an important source of raw materials from Ashley National Forest-administered lands and falls within provisioning services. In the 2008 Beliefs and Values study (Russell 2008), participants noted the contribution of economic benefits to local communities, as well as the benefit provided to national energy reserves. Others, however, noted the impacts of increased development as a result of energy activity and the changes to communities and social structure that result. Participants in the study noted population growth, increased diversity among residents, increased employment, higher wages, increased housing prices, decreases in the availability of affordable housing, increases in substance abuse, increases in traffic, and strains on infrastructure, and an overall "busy" pace of life (Russell 2008).

4.6.6 Ecological Sustainability

Oil and gas development may result in impacts on other resources and resource uses on the Ashley National Forest. Participants in the 2008 Beliefs and Values study (Russell 2008) note that given the development activities on other public and private lands, they believe the best use of National Forest lands might be for purposes other than oil and gas activity. Concerns about oil and gas development include assessments of the effects of oil and gas development on other Ashley National Forest resources and user experiences.

Some statements, such as the following, express concern about the possible impacts on recreational users from oil and gas development: "There is an awful lot of public land being developed for oil and gas. Why the National Forest too? I don't want to see oilrigs when I go to the Forest; you see them so many other places. If they allow oilrigs, it would change the place. People enjoy a place where there isn't that kind of development. There is not a lot of great public land left and it is a valued and limited resource. We need to keep some of it from development and I would like to see the Ashley as a place free from oilrigs."

4.6.7 Contributions of Use/Enjoyment to Economic Sustainability

As discussed in **Section 3.2.3**, energy and mineral development represents an important source of income and employment in the socioeconomic planning area. More than 89 percent of survey respondents in Daggett, Duchesne, and Uintah Counties expressed that development of energy resources on public lands is either moderately important or very important (Krannich 2008).

The study also showed that 79 percent of respondents felt that the extent of mineral exploration and extraction on public lands should either stay about the same (41 percent) or increase (38 percent). The continued level of economic

impacts depends on market conditions for the resource(s), which is determined by the global market and is, in large, part, outside of the control of Forest Service management. In addition, the degree to which development may exclude other land uses with economic contributions should be noted (e.g., visitors interested in recreation may find an area with mineral development less desirable for this activity, and therefore economic contributions from this use would be decreased).

4.6.8 Key Indicators

- Acres available for oil and gas leasing
- Employment and income supported by energy and development operations

4.6.9 Summary

Mineral and Energy development represents a key economic sector in the socioeconomic planning area, and resources from the Ashley National Forest contribute a small but important percentage of the minerals developed. Levels of minerals available for development should be balanced with needs for other resource and resource uses to ensure that a range of resources are supported in the future. Market demand, as influenced by factors outside of the Ashley National Forest control, will continue to dictate the economic sustainability of mineral development.

4.7 SUMMARY

The 1986 Forest Plan was designed based upon consideration of environmental, social, and economic factors and aimed to maximize net public benefit consistent with the principals of multiple use and sustained yield.

Based on current economic modeling and social input, the Ashely National Forest represents a minor contribution to local economic and social stability in the region overall, though contributions at the community level may be more significant. The demand for forest resources, and the level of impact of management decisions, would continue to be influenced by external market conditions, which are likely to be variable over the planning period. As a result, any future management actions would be designed balance tradeoffs of services provided, and provide long term forest productivity and ecological and economic sustainability.

This page intentionally left blank.

CHAPTER 5
REFERENCES

Arno, S. F. 1996. "The seminal role of fire in ecosystem management–impetus for this publication." Pp. 3-5. In: The use of fire in forest restoration (C. C. Hardy and F. Arno, editors). U.S. Department of Agriculture Forest Service, Intermountain Experiment Station, Ogden, Utah.

Birdwell, J. E., T. J. Mercier, R. C. Johnson, and M. E. Brownfield. 2013. In-place oil shale resources examined by grade in the major basins of the Green River Formation, Colorado, Utah, and Wyoming: U.S. Geological Survey Fact Sheet 2012–3145: Internet website: http://pubs.usgs.gov/fs/2012/3145/.

BLM and Forest Service (United States Department of the Interior, Bureau of Land Management, and United States Department of Agriculture, Forest Service). 2015. Utah Greater Sage-Grouse Proposed Land Use Plan Amendment and Final Environmental Impact Statement. BLM Utah State Office, Salt Lake City, Utah.

Brown, T. C., J. C. Bergstrom, and J. B. Loomis. 2007. "Defining, valuing, and providing ecosystem goods and services." *Natural Resources Journal* 47(2):329-376.

Bedel, T. E. 2005. Glossary of Terms Used in Range Management, 4th Ed. .Denver, CO: Society for Range Management. Page 2.

Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. V. O'Neill, J. Paruelo, R. G. Raskin, P. Sutton & M. van den Belt. 1997. "The value of the world's ecosystem services and natural capital." *Nature* 387:253–260.

Daggett County. 2016. Emergency Services. Internet website: http://www.daggettcounty.org/.

Daily, G. C., S. Alexander, P. R. Ehrlich, L. Goulder, J. Lubchenco, P. A. Matson, H. A. Mooney, S. Postel, S. H. Schneider, D. Tilman, G. M. Woodwell. 1997. "Ecosystem services: Benefits supplied to human societies by natural ecosystems." *Issues in Ecology* (2) spring 1997.

Dean Runyan Associates. 2016. Wyoming Travel Impacts 2000-2015. Prepared for the Wyoming Office of Tourism, Cheyenne. April 2016.

Duchesne County. 2016. Emergency services. Internet website: https://www.duchesne.utah.gov/.

Eichman, H. 2009. Forest Service. U.S. Department of Agriculture. Ashley National Forest: Economic Environment. Report prepared in coordination with Forest Plan revision. Vernal, Utah.

Forest Service (United States Department of Agriculture, Forest Service). 1986. Ashley National Forest Land and Resource Management Plan. Vernal, Utah. Internet website: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5277280.pdf

_____. 2005. Land Systems Inventory. Ashley National Forest. Inventory maintained by Forest Ecologist (S. Goodrich) and Forest Soil Scientist (D. Koerner). Original inventory: Andrew E. Godfrey. 1976. Description of Land Types and Landtype Associations on the Ashley National Forest. Unpublished. U.S. Department of Agriculture, Forest Service.

_____. 2012. National Visitor Use Monitoring Survey for the Ashley National Forest – Round 3. Internet website: http://apps.fs.fed.us/nfs/nrm/nvum/results/A05003.aspx/Round3.

_____. 2015. ASR 18-1, Secure Rural Schools Act Titles I, II, and III. Internet website: http://www.fs.usda.gov/main/pts/securepayments.

_____. 2016a. Ecosystem Management Coordination Staff. Website Analysis Methods Guide: The Estimated Economic Contributions of National Forests and Grasslands. Internet website: http://fsweb.wo.fs.fed.us/economic_contribution.

_____. 2016b. The Four Corners Timber Harvest and Forest Products Industry, 2012. Internet website: http://www.fs.fed.us/rm/pubs/rmrs_rb021.pdf.

_____. 2016c. Forest Products Cut and Sold from the National Forests and Grasslands. Internet website: http://www.fs.fed.us/forestmanagement/products/cut-sold/index.shtml.

_____. 2016d. Livestock Grazing Allotment data. Unpublished data provided by Ashley National Forest staff. Vernal, Utah.

_____. 2016e. Launches and Shuttles to the Green River and Flaming Gorge by Local Outfitter and Guides. Provided by personal communication with Ashley National Forest staff, Ryan Buerkly. Vernal, Utah.

_____. 2016f. Fiscal Year 2017 National Forest Service Budget Overview. February 2016. Internet website: Fiscal Year 2017. Washington, DC. Internet website: http://fs.fed.us/sites/default/files/fy-2017-fs-budget-overview.pdf

_____. 2016g. Average Annual Timber Product Removal (2006-2015). Unpublished data provided by Ashley National Forest staff, Vernal, Utah.

_____. 2016h. Vegetation data. Unpublished data provided by Ashley National Forest staff. Vernal, Utah.

_____. 2016i. Watershed data. Unpublished data provided by Ashley National Forest staff. Vernal, Utah.

_____. 2016j. Consumptive and nonconsumptive water use data. Unpublished data provided by Ashley National Forest staff. Vernal, Utah.

_____. 2017a. Economic Environment Report. Prepared by Forest Service TEAMS Enterprise Unit for Ashley National Forest, Vernal, Utah.

_____. 2017b. Public Draft Lands Specialist Report. Ashley National Forest. Vernal, Utah.

_____. 2017c. Public Draft Areas of Tribal Importance Report. Ashley National Forest. Vernal, Utah.

_____. 2017d. Public Draft Energy, Minerals, and Geological Hazards Specialist Report. Ashley National Forest. Vernal, Utah.

_____. 2017e. Public Draft Recreation Specialist Report. Ashley National Forest. Vernal, Utah.

_____. 2017f. Public Draft Infrastructure Report. Ashley National Forest. Vernal, Utah.

_____. 2017g. Public Draft Scenic Resources Specialist Report. Ashley National Forest. Vernal, Utah.

_____. 2017h. Public Draft Terrestrial Ecosystems Report. Ashley National Forest. Vernal, Utah.

_____. 2017i. Public Draft Water, Air, and Soils Specialist Report. Ashley National Forest. Vernal, Utah.

_____. 2017j. Public Draft Aquatic Ecosystems Report. Ashley National Forest. Vernal, Utah.

_____. 2017k. Public Draft Species of Conservation Concern Report. Ashley National Forest. Vernal, Utah.

_____. 2017l. Public Draft Energy Resources, Mineral Resources and Geologic Hazards and Resources Report. Ashley National Forest. Vernal, Utah.

Gardunio, E. I., C. A. Myrick, R. A. Ridenour, R. M. Keith, and C. J. Amadio. 2011. "Invasion of illegally introduced burbot in the upper Colorado River Basin, USA.". *Journal of Applied Ichthyology*. Volume 27, Issue (1):36–42.

Giunta, A. D., M. J. Jenkins, E. G. Hebertson, and A. S. Munson. 2016. Disturbance Agents and Their Associated Effects on the Interior Douglas-Fir Forests in the Central Rocky Mountains. Forests 2016, 7, 80. Internet website: http://www.mdpi.com/journal/forests.

Headwaters Economics. 2012. West is Best How Public Lands in the West Create a Competitive Economic Advantage. November 2012. Internet website: http://headwaterseconomics.org/land/west-is-best-value-of-public-lands.

Kline, J. D. 2006. "Defining an Economics Research Program to Describe and Evaluate Ecosystem Services in the Management of Public Lands". General Technical Report PNW-GTR-700, Pacific Northwest research Station, U.S. Department of Agriculture, Forest Service. Portland, Oregon.

Krannich, R. S. 2008. Public Lands and Utah Communities Survey. Utah State University. Institute for Social Science Research. Internet website: http://publiclands.utah.gov/wp-content/uploads/2013/08/PublicLandsandCommunities.pdf.

Millennium Ecosystem Assessment. 2005. Ecosystems and Human Well-Being. A Framework for Assessment. Internet website: http://millenniumassessment.org/en/Framework.html.

Minnesota IMPLAN Group. 2014. IMPLAN Professional Version 3.1.

Mitchell, J. E. 2000. Rangeland resource trends in the United States: A technical document supporting the 2000 USDA Forest Service RPA Assessment. Gen. Tech. Rep. RMRS-GTR-68. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.

National Agricultural Statistics Service. 2006. MODIS, Land Cover Type Yearly L3 Global 1km MOD12Q1, as reported in Headwaters Economics' Economic Profile System. Internet website: headwaterseconomics.org/eps.

_____. 2012. U.S. Department of Agriculture. Census of Agriculture, Volume 1, Chapter 2: County Level Data. Issued May 2014. Internet website: https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/.

Nelson, S. R. 1997. History of the Uinta National Forest. A Century of Stewardship. Uinta National Forest. Vernal, Utah.

Patterson, M. E., J. M. Montag, and D. R. Williams. 2003. "The urbanization of wildlife and management: Social Science, conflict, and decision-making." *Urban Forestry and Urban Greening* 1(3):171-184.

Russell, J. C. 2008. Adams-Russell Consulting. Aspects of Beliefs and Values Regarding Resources and Management of the Ashley National Forest. Ashley National Forest. Vernal, Utah.

Shamo, M. L. 2012. Historical Grazing on the Ashley National Forest. U.S. Department of Agriculture, Forest Service, Intermountain Region. The University of Utah's American West Center. Salt Lake City, Utah.

Sweetwater County. 2016. Emergency Services. Internet website: https://www.sweet.wy.us/.

Taylor, D. T., R. H. Coupal, and J. G. Thompson. 2004. The Economic Importance of Livestock Grazing on BLM Land in Fremont County Wyoming. University of Wyoming Department of Agricultural and Applied Economics. October, 2004. Internet website: http://www.uwagec.org/WyoCRE/Publications/Fremont%20County%20final26Oct04.pdf.

Taylor, D. T., and T. Foulke. 2016. Sweetwater County Related Hunting and Fishing Spending, 2015. University of Wyoming, Department of Agricultural and Applied Economics. Prepared for the Sweetwater County Commissioners. September 2016. Internet website: http://wyomingwildlife.org/public-lands/wpli/economic-impact/.

The Outdoor Foundation. 2015. Outdoor Recreation Participation. Topline report. Internet website: http://www.outdoorfoundation.org/pdf/ResearchParticipation2015Topline.pdf

UDWR (Utah Department of Natural Resources, Division of Wildlife Resources). No Date. Utah Hunting Upland Game, Locating white-tailed ptarmigan in the Uinta Mountains. Internet website: https://wildlife.utah.gov/uplandgame/ptarmigan/uinta_wt.php.

_____. 2003. Strategic Management Plan for Chukar Partridge (*Alectoris chukar*). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2009a. Utah Pronghorn Statewide Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2009b. Utah Moose Statewide Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2011a. Moose Herd Unit Management Plan. Herd Unit 8A, B, and C. North Slope; West Daggett-Three Corners and Summit. Utah Department of Natural Resources, Division of Wildlife Resources. March 2011. Salt Lake City, Utah.

_____. 2011b. Moose Herd Unit Management Plan. 2011. Herd Unit 9. South Slope. Utah Department of Natural Resources, Division of Wildlife Resources. March 2011. Salt Lake City, Utah.

_____. 2011c. Utah Black Bear Management Plan V.2.0 2011-2023. UDWR Publication 11-01. Utah Division of Wildlife Resources and the Utah Black Bear Advisory Committee, Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2013a. Utah Bighorn Sheep Statewide Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2013b. Utah Mountain Goat Statewide Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2013c. Final Conservation Plan for Greater Sage-grouse in Utah. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2014a. Mountain Goat Herd Unit Management Plan. Wildlife Management Units #7, #8, #9. Uinta Mountains (Kamas, N. Slope, S. Slope). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2014b. Utah Wild Turkey Management Plan 2014. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2015a. Utah Elk Statewide Management Plan. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2015b. Utah Cougar Management Plan V.3 2015-2025. UDWR Publication No. 15-28. Utah Division of Wildlife Resources and the Cougar Advisory Group. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2015c. Blue Ribbon Fishing. Internet website: https://wildlife.utah.gov/hotspots/blueribbon.php.

_____. 2015d. Fishing Reports. Internet website: https://wildlife.utah.gov/hotspots/.

_____. 2015e. Utah Upland Game Annual Report 2014-2015. Publication 15-24. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2016a. Deer Herd Management Plan–Deer Herd Unit #8 (North Slope). Utah Department of Natural Resources, Division of Wildlife Resources, Department of Natural Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/408-unit-deer-management-plans.html.

_____. 2016b. Deer Herd Management Plan–Deer Herd Unit #9 (South Slope). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/408-unit-deer-management-plans.html.

_____. 2016c. Deer Herd Management Plan–Deer Herd Unit #11 (Nine Mile). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/408-unit-deer-management-plans.html.

_____. 2016d. Deer Herd Management Plan–Deer Herd Unit #17 (Wasatch Mountains). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/408-unit-deer-management-plans.html.

_____. 2016e. Elk Herd Unit Management Plan–Elk Herd Unit #8 (North Slope). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/1965-unit-elk-management-plans.html.

_____. 2016f. Elk Herd Unit Management Plan–Elk Herd Unit #9 (South Slope). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/1965-unit-elk-management-plans.html.

_____. 2016g. Elk Herd Unit Management Plan–Elk Herd Unit #11 (Nine Mile). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/1965-unit-elk-management-plans.html.

_____. 2016h. Elk Herd Unit Management Plan–Elk Herd Unit #17 (Wasatch Mountains). Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah. Internet website: https://wildlife.utah.gov/hunting-in-utah/hunting-information/big-game/118-hunting/big-game/1965-unit-elk-management-plans.html.

_____. 2016i. Utah Furbearer Annual Report 2015-2016. Publication No. 14-17. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

_____. 2017. 2017 Deer and Elk Herd Status and Antlerless Permit Recs. Utah Department of Natural Resources, Division of Wildlife Resources, Salt Lake City, Utah.

Uinta County. 2016. Emergency Services. Internet website: http://www.uintacounty.com/126/Fire-Protection.

Uintah Fire District. 2016. Fire services. Internet website: http://www.uintahfire.com/.

University of Utah. 2015. Ken C. Gardner Policy Institute. Utah Travel and Tourism Profiles. 2013-2014. Internet website: https://travel.utah.gov/wp-content/uploads/CombinedTourismProfiles.pdf.

U.S. Bureau of Economic Analysis (United States Department of Commerce, Bureau of Economic Analysis). 2014a. CA25N Total Full-Time and Part-Time Employment by NAICS Industry. U.S. Department of Commerce. Internet website: http://www.bea.gov/.

_____. 2014b. CA5N Personal Income by Major Component and Earnings by NAICS Industry. U.S. Department of Commerce. Internet website: http://www.bea.gov/.

_____. 2017. Consumer Price Index Inflation calculator. Internet website: https://www.bls.gov/data/inflation_calculator.htm

U.S. Bureau of Labor Statistics (United States Department of Labor, Bureau of Labor Statistics). 2016. Local Area Unemployment Statistics. Internet website: www.bls.gov.

U.S. Census Bureau (United States Department of Commerce, Census Bureau). 1990. CPH-2-1: Census of Population and Housing. Internet website: http://www.census.gov/library/publications/1993/dec/cp-2.html.

_____. 2000a. Census 2000 Summary File, DP-1: Profile of General Demographics. Internet website: factfinder2.census.gov.

_____. 2000b. Census 2000 Summary File, SF-1: Population, Housing Units, Area, and Density. Internet website: actfinder2.census.gov.

_____. 2010a. Census 2010, DP-1: Demographic Profile Data. Internet website: factfinder2.census.gov.

_____. 2010b. Census 2010 Summary File, SF-1: Population, Housing Units, Area, and Density. Internet website: factfinder2.census.gov.

_____. 2015. American Fact Finder. American Community Survey 5-Year Estimates. Internet website: http://factfinder.census.gov/.

_____. 2016a. American Community Survey 5-Year estimates. As reported in Headwaters Economics' Economic Profile System. Internet website: headwaterseconomics.org/eps.

_____. 2016b. County Business Patterns. As reported in Headwaters Economics' Economic Profile System. Internet website: headwaterseconomics.org/eps.

_____. 2016c. Poverty thresholds. Internet website: http://www.census.gov/data/tables/time-series/demo/income-poverty/historical-poverty-thresholds.html

_____. 2016d. Small Area Income and Poverty Estimates (SAIPE). Internet website: https://census.gov.

U.S. Department of the Interior. 2015. Office of Natural Resources. Federal Onshore SY Revenues by County. 2006-2015. Internet website: http://useiti.doi.gov

_____. 2016. Payments in Lieu of Taxes. Internet website: https://www.doi.gov/pilt.

U.S. Energy Information Administration. 2016. U.S. Department of Energy. Spot Prices for Crude Oil and Petroleum Products: Cushing, OK. Internet website: http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=PET&s=RWTC&f=M.

Utah Department of Natural Resources, Division of Oil, Gas, and Mining. 2016a. Publications. Internet website: https://oilgas.ogm.utah.gov/pub/Publications/Reports/State_Rankings_OilProd_13-12.pdf.

_____. 2016b. Statistics. Internet website: http://oilgas.ogm.utah.gov/Statistics/Statistics.cfm.

Utah Department of Public Safety. 2015. Preliminary Crime in Utah Report 2015. Bureau of Criminal Identification. Internet website: https://bci.utah.gov/utah-crime-statistics/.

Utah Department of Workforce Services. 2016a Economic Snapshots. Updated September 8, 2016. Internet website: http://jobs.utah.gov/wi/regions/county/index.html.

_____. 2016b. Population Data Viewer. Internet website: http://jobs.utah.gov/jsp/wi/utalmis/gotoPopulation.do.

_____. 2017. Economic Snapshots. Updated 2017. Available from Internet website: http://jobs.utah.gov/wi/regions/county/index.html.

Utah Energy. 2016. Energy Development in the Uintah Basin. Internet website: http://energy.utah.gov/view-energy-development-fuels-uintah-basin-economy/.

Utah Fish Finder. 2016. Utah Fishing Reports Statewide. Internet website: http://www.utahfishfinder.com/fishing.shtml.

Utah Governor's Office of Management and Budget. 2012. Baseline Projections. Internet website: https://gomb.utah.gov/budget-policy/demographic-economic-analysis/.

Ute Indian Tribe. 2013. General overview. Internet website: www.utetribe.com/.

Vose, J. M. J. S. Clark, C. H. Luce, and T. Patel-Weynard, 2016. Effects of Drought on Forests and Rangelands in the United States: A Comprehensive Science Synthesis. General Tech Report WO-93b. U.S. Department of Agriculture, Forest Service, Washington, DC. Forest Service

Western Association of Fish and Wildlife Agencies Wild Sheep Working Group. 2012. Recommendations for Domestic Sheep and Got Management in Wild Sheet Habitat. Internet website: https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5385708.pdf.

White, E. M., and D. J. Stynes. 2008. National Forest Visitor Spending Averages and the Influence of Trip-Type and Recreation Activity. Journal of Forestry. January/February 2008. Internet website: http://www.wildfire-economics.org/Library/White_&_Stynes_2008.pdf.pd

Wyoming Department of Administration and Information, Economic Analysis Division. 2016. Economic Summary: 3Q2016. Internet website: http://eadiv.state.wy.us/wel/Economic_Summary3Q16.pdf

Wyoming Department of Employment. 2015. Declining Industries Report for Third Quarter 2015 in NAICS. Internet website: https://doe.state.wy.us/lmi/G_DInd/G_D_Industries.htm.

Wyoming Department of Workforce Services. 2016. Wage Records in Wyoming: Employment and Earnings by Age, Gender, County, & Industry, 2000-2015. Internet website: http://doe.state.wy.us/lmi/trends/1016/1016.pdf.

Wyoming Division of Criminal Investigation. 2015. Uniform Crime Report. Internet website: http://wyomingdci.wyo.gov/dci-criminal-justice-information-systems-section/uniform-crime-reporting.

Wyoming Oil and Gas Conservation Commission. 2017. County Reports. Internet website: http://wogcc.state.wy.us/CntyTable.cfm?oops=1.

Wyoming State Government. 2017. Consensus Revenue Estimating Group (CREG). Revenue Forecast Fiscal Year 2017 – Fiscal Year 2022. Internet website: http://eadiv.state.wy.us/creg/GreenCREG_Jan17.pdf.

This page intentionally left blank.