

## **3.0 AFFECTED ENVIRONMENT**

### **3.1 PROJECT AREA OVERVIEW**

#### **3.1.1 GEOGRAPHIC SETTING**

The Monticello planning area (PA) is located in the southeastern corner of Utah, adjacent to the Colorado and Arizona borders. A part of the Colorado Plateau region, the Monticello PA, is bounded by the Colorado River to the west, Canyonlands National Park and the Moab PA to the north, and the Colorado and Arizona state borders to the east and the south, respectively. The Abajo Mountains are situated in the heart of the Monticello PA. Elevations within the Monticello PA range between 3,700 at Lake Powell (near Bullfrog) and 11,360 feet at Abajo Peak (located in the Manti-LaSal National Forest).

#### **3.1.2 CLIMATE**

The climate of the Monticello PA shows wide seasonal temperature variations and both temperature and precipitation vary with elevation. Across the Monticello PA, summer precipitation generally comes from brief, heavy thunderstorms. Accumulated winter snow pack melts early in the spring and acts to infiltrate dry desert soils and recharge aquifers.

Precipitation in the southern section of the Monticello PA (near Bluff) averages 8 inches annually with most falling as rain in the late autumn months. Spring and summer thunderstorms are generally brief and violent, often resulting in flash flooding. Summers are hot, with daytime highs averaging 94°F and lows in the high 50s, although extreme highs over 110°F are not uncommon. Winters are cold, with highs averaging 46°F, and lows averaging 20°F.

The western section of the Monticello PA receives an average of 6 inches of precipitation a year, mostly in the late fall as snow. However, rain is not uncommon in the spring and late summer. Maximum summer temperatures average in the high 90s, while winter highs average 48°F, with lows generally in the high 20s.

The climate of the middle section of the Monticello PA (near Blanding) includes low humidity, warm summer temperatures and cool winters. Annual precipitation averages 13 inches, most of which comes in the form of fall rains and winter snows (11 inches). Maximum summer temperatures average 81°F, while winter temperatures average highs of 38°F and lows of 16°F.

The northern section of the Monticello PA (near Monticello) receives an average of 15 inches of precipitation annually; most of this comes in late summer thunderstorms and fall snows, which can leave heavy accumulations in the higher elevations. Maximum summer temperatures average in the high 80s during the day and low 50s at night. Winter high temperatures average 42°F, with nighttime temperatures in the high teens.

Air temperature and precipitation data collected from 1948 through 2003 for 4 locations in the Monticello PA are displayed in Table 3.1 and Figure 3.1 (WRCC 2004). (Peak elevation temperature and precipitation information was not available.)

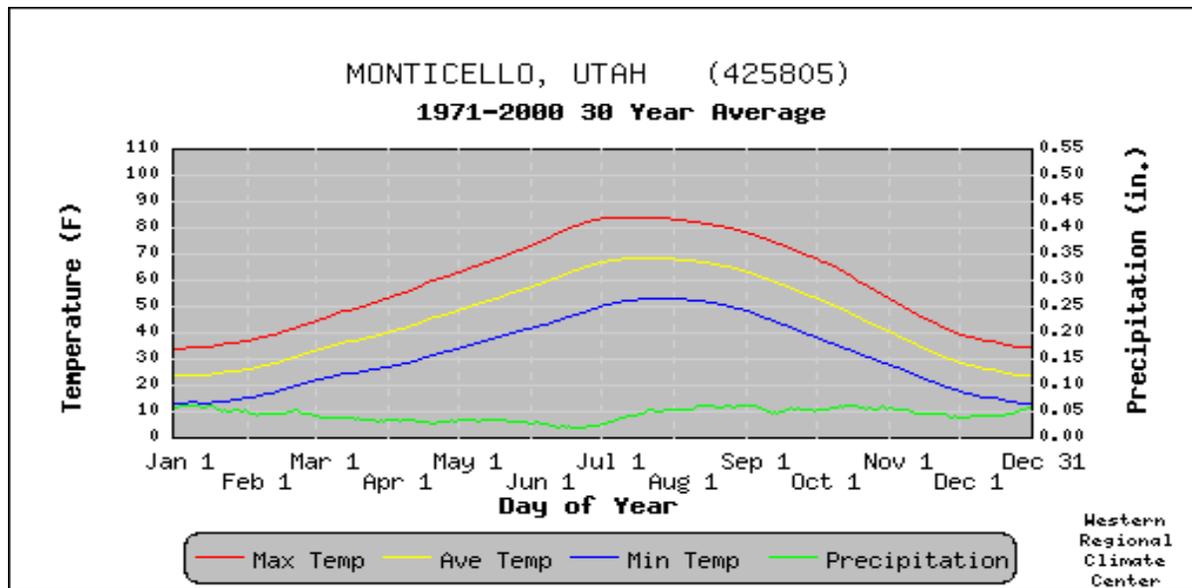
**Table 3.1. Temperature and Precipitation Data for 4 Locations in the Monticello PA**

Temperature (°F)								
Station	General Location	Elevation (feet)	Summer Means		Winter Means		Extremes	
			High	Low	High	Low	High	Low
Blanding	Northern	7,066	86.0	54.8	41.6	19.4	110	-23.0
Monticello	Middle	6,105	81.4	50.0	37.9	16.0	101	-22.0
Bullfrog	Western	3,712	96.5	67.5	48.4	27.2	110	0
Bluff	Southern	4,440	93.6	58.6	46.2	20.3	109	-22.0

Precipitation (inches)								
Station	Mean				Annual			
	Winter	Spring	Summer	Fall	Mean	High	Low	
Monticello	3.8	2.9	4.0	4.3	15.0	23.1	6.6	
Blanding	3.9	2.6	3.0	3.8	13.3	24.4	4.9	
Bullfrog	1.3	1.2	1.1	2.2	5.9	11.5	2.2	
Bluff	2.1	1.5	1.8	2.4	7.8	15.7	3.0	

Source: WRCC 2004.



- - Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1971 and 2000.
- - Ave. Temp. is the average of all daily average temperatures recorded for the day of the year between the years 1971 and 2000.
- - Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1971 and 2000.
- - Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1971 and 2000.

**Figure 3.1. Thirty-year precipitation and air temperature plots for Monticello, Utah (WRCC 2004).**

The Monticello PA has been experiencing drought for much of the last 5 years. The effects of the drought are discussed in detail in Sections 3.2, Air Quality, and 3.18, Vegetation.

## **3.2 AIR QUALITY**

### **3.2.1 INTRODUCTION**

Meteorological and topographical characteristics within the Monticello PA and the surrounding lands affect the transport, deposition and dispersion of emissions within the planning area and region. The effects of both emissions and management decisions within the area influence air quality throughout the area, not just within the boundaries of the planning area. The area within which air resources could be affected by activities within the planning area is referred to as the study area. The Monticello RMP study area includes the planning area and other areas such as Canyonlands and Zion National Parks.

The Monticello PA has been experiencing drought for much of the last 5 years, with extremely dry conditions occurring during the summer of 2002, when the Palmer Drought Severity Index (PDSI) reached near-record severity based on the last 100 years of instrumental data (NCDC 2004). These dry conditions have resulted in an increase of wind-blown dust and associated particulate matter in the Monticello PA and adjacent areas.

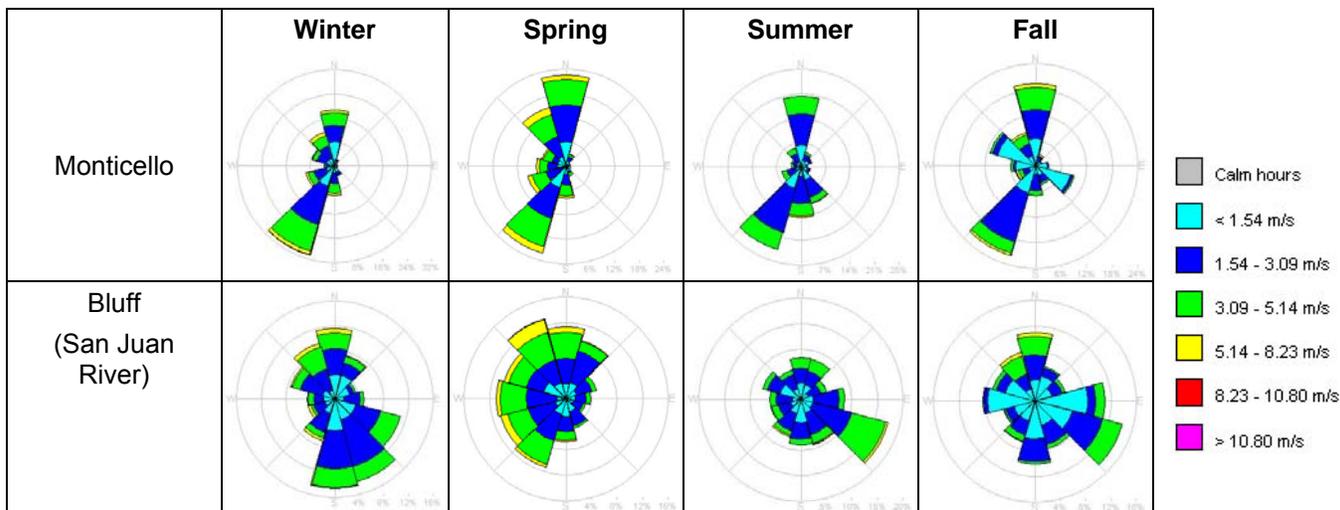
Drought is not the only climatic condition that can affect air quality in the planning area. Winter inversions and wind direction and speed can also have a great impact on air quality. When the air temperature near the ground is lower than the air temperature above, a phenomenon called a surface temperature inversion occurs. Surface inversions form because the ground cools faster than the air above. In most areas of the Monticello PA, inversions are fairly typical winter occurrences that dissipate rapidly when early morning sunlight warms the air near the ground surface. In areas where the local topography acts to pool and trap cold air (deep valleys surrounded by steep mountains) however, cold temperatures associated with stationary or slow moving high pressure systems can last for days or (rarely) even weeks and create inversions that result in poor air quality due to the compression of cold air masses and lack of circulation.

Inversions can hinder air pollutant dispersion by reducing vertical mixing. The mixing height of the plume is the height above the surface through which free vertical mixing occurs. Mixing height is often bounded by the inversion layer in the atmosphere. The dispersion of air pollutants is confined within the mixing height of the atmosphere. High mixing heights promote emissions dispersion and result in low ground level pollutant concentration. On the other hand, low mixing heights often trap emissions and result in high ground level concentration. Monticello, Blanding and Bluff are not as prone to inversions compared to other parts of the Monticello PA due to local topography, minimal snowfall, warmer wintertime low temperatures or other climatological conditions.

Air pollutant dispersion is also dependent on the wind. The pollutant path is determined by the wind direction, and the speed of transport is determined by the wind speed. Wind direction in the Monticello PA is highly influenced by the local terrain. For example, the winds along the San Juan River in San Juan County tend to blow from the west and the northwest in the spring and

blow from the east and the southeast in the other seasons (Trinity Consultants [Trinity] 2003). In the city of Monticello, which is located on the flanks of the Abajo Mountains, the winds predominately blow from the south or southwest.

Figure 3.2 presents the windroses for two cities in the Monticello PA. Windroses are graphical representations of wind speed, frequency, and direction for a given location. As can be seen from the seasonal windroses, the wind patterns in the area vary widely by season and local terrain. Therefore, dispersion and transport of pollutants are also variable in this region depending on the locations.



Data Source: 1996 Mesoscale Model (MM5) data processed using the CALMET meteorological model. The observed data from various meteorological stations are used to generate these windroses. Meteorological stations include Grand Junction, Montrose County Airport, Price/Carbon, etc.

**Figure 3.2. Seasonal windroses<sup>1</sup> in the Monticello PA.**

### 3.2.2 NATIONAL AMBIENT AIR QUALITY STANDARDS

The Code of Federal Regulations (CFR) sets National Ambient Air Quality Standards (NAAQS) in Title 40 of CFR, Part 50 (40 CFR 50). The purpose of primary NAAQS is to protect the health of the most sensitive people such as elderly and asthmatic individuals, while the purpose of secondary NAAQS is to protect public welfare from known or anticipated adverse effects associated with the presence of air pollutants, such as damage to property or vegetation. The NAAQS apply to 6 pollutants: carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), ozone (O<sub>3</sub>), and particulate matter whose diameters are smaller than 10 micrometers (PM<sub>10</sub>) or smaller than 2.5 micrometers (PM<sub>2.5</sub>), and lead (Pb). An area that does not meet the NAAQS for one or more of these pollutants would be designated as a non-attainment area on a pollutant by pollutant basis. The Monticello PA is located in an area designated as attainment for

<sup>1</sup> Windroses depict the relative frequency of wind direction as defined by the directions on a compass scale. In the diagrams above 8 directions are used (north, northeast, east, southeast, south, southwest, west and northwest, starting from the top of the diagram and going clockwise. Each ring on the wind rose represents an increased frequency (percent of the total) as described by the values listed at the bottom of the diagram (for example: 8%, 16%, 24%, 32% for winter winds in Monticello). Each branch of the rose represents wind coming from that direction. The branches are divided into segments of different thickness and color, which represent wind speed ranges from that direction. Speed ranges are identified in the scale to the right of the diagram. The length of each segment within a branch is proportional to the frequency of winds blowing within the corresponding range of speeds from that direction.

all pollutants (EPA 2003a). Table 3.2 present the existing ambient air quality in the Monticello PA (EPA 2003b).

The data listed are the most recent available for each pollutant. If there is no monitor located within the boundary of the Monticello PA, the data from the nearest representative monitor(s) were chosen. Most of the available monitoring stations are located east or southeast of the planning area. As outlined in Table 3.2 of this chapter, the air quality in and near the Monticello PA meets the NAAQS by a large margin with the exception of ozone which is just under the 8-hour NAAQS at Canyonlands National Park.

A recent assessment of air quality in National Parks around the country found that ozone concentrations and ammonium deposition increased significantly at Canyonlands National Park between 1995 and 2004 (GPRA 2005). The same report, however, found improvements in nitrate and sulfate deposition, although these improvements were not found to be statistically significant (GPRA 2005). In 2005, Canyonlands National Park did not meet a National Park Service internal air quality goal (called Ia3), which incorporates visibility, atmospheric deposition, and ozone concentration targets.

**Table 3.2. Ambient Air Quality Data for the MPA**

Pollutant	Averaging Period <sup>a</sup>	NAAQS	Monitored Concentration	Monitored Location (City, County, State)
CO	1 hour	35.0 ppm <sup>b</sup>	2.8 ppm <sup>n</sup>	Grand Junction, Mesa Co., CO
	8 hour	9.00 ppm <sup>b</sup>	1.8 ppm <sup>n</sup>	Grand Junction, Mesa Co., CO
NO <sub>2</sub>	Annual	0.053 ppm	0.003 ppm <sup>k</sup>	La Plata Co., CO
			0.016 ppm <sup>k</sup>	Bloomfield, San Juan Co., NM
SO <sub>2</sub>	3 hour	0.50 ppm <sup>b,c</sup>	0.082 ppm <sup>i</sup>	Shiprock, San Juan Co., NM
	24 hour	0.14 ppm <sup>b</sup>	0.013 ppm <sup>i</sup>	Shiprock, San Juan Co., NM
	Annual	0.03 ppm <sup>b</sup>	0.002 ppm <sup>k</sup>	Shiprock, San Juan Co., NM
Ozone	1 hour	0.12 ppm <sup>d</sup>	0.086 ppm <sup>i</sup>	La Plata County, CO
			0.077 ppm <sup>i</sup>	Mesa Verde NP, Montezuma Co., CO
			0.086 ppm <sup>i</sup>	Farmington, San Juan Co., NM
			0.082 ppm <sup>i</sup>	Island-in-the-Sky, Canyonlands NP, UT
	8 hour	0.075 ppm <sup>e</sup>	0.055 ppm <sup>j</sup>	La Plata County, CO
			0.073 ppm <sup>j</sup>	Mesa Verde NP, Montezuma Co., CO

**Table 3.2. Ambient Air Quality Data for the MPA**

Pollutant	Averaging Period <sup>a</sup>	NAAQS	Monitored Concentration	Monitored Location (City, County, State)
			0.072 ppm <sup>j</sup>	Farmington, San Juan Co., NM
			0.070 ppm <sup>j</sup>	Island-in-the-Sky, Canyonlands NP, UT
PM <sub>10</sub>	24 hour	150 µg/m <sup>3</sup> <sup>f</sup>	25 µg/m <sup>3</sup> <sup>o</sup>	Farmington, San Juan Co., NM
	Annual	50 µg/m <sup>3</sup>	15 µg/m <sup>3</sup> <sup>k</sup>	Farmington, San Juan Co., NM
PM <sub>2.5</sub>	24 hour	35 µg/m <sup>3</sup> <sup>g</sup>	13 µg/m <sup>3</sup> <sup>m</sup>	Farmington, San Juan Co., NM
	Annual	15 µg/m <sup>3</sup> <sup>h</sup>	5.9 µg/m <sup>3</sup> <sup>k</sup>	Farmington, San Juan Co., NM

<sup>a</sup> The concentration values listed in this table are based on the monitored concentrations in 2007 provided by the EPA AirData database (URL: <http://www.epa.gov/oar/data/>).

<sup>b</sup> Not to be exceeded more than once per year.

<sup>c</sup> SO<sub>2</sub> 3-hour standard is a secondary NAAQS that sets limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

<sup>d</sup> The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas.

<sup>e</sup> The 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm (effective May 27, 2008).

<sup>f</sup> Not to be exceeded more than once per year on average over 3 years.

<sup>g</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup> (effective December 17, 2006).

<sup>h</sup> To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

<sup>i</sup> Concentration is the maximum value detected at the monitored location in 2007 according to the EPA AirData database.

<sup>j</sup> Concentration is the 3 year average of 4<sup>th</sup> maxima detected at the monitored location in 2005, 2006, and 2007 according to the EPA AirData database.

<sup>k</sup> Concentration is the arithmetic mean at the monitored location in 2007 according to the EPA AirData database.

<sup>m</sup> Concentration is the 3-year average of the 98<sup>th</sup> percentile of the 24-hour values collected in 2005, 2006, and 2007 according to the EPA AirData database.

<sup>n</sup> Concentration is the 2<sup>nd</sup> maximum value detected at the monitored location in 2007 according to the EPA AirData database.

<sup>o</sup> Concentration is the 3-year average of the 2<sup>nd</sup> maxima detected at the monitored location in 2005, 2006 and 2007 according to the EPA AirData database.

### 3.2.3 PREVENTION OF SIGNIFICANT DETERIORATION

Potential air quality impact criteria also include Prevention of Significant Deterioration (PSD) increments. A PSD increment is the maximum increase in ambient concentrations of a certain pollutant that is allowed to occur above a baseline concentration for that pollutant. Federal Mandatory Class I areas with pristine air quality, such as some wilderness areas, National Parks, and Tribal reservation lands, are accorded the strictest protection. Only very small incremental increases in concentration are allowed in these areas to ensure the maintenance of their pristine air quality. The State of Utah has the authority and responsibility to determine compliance with PSD by performing a regulatory PSD Increment Consumption Analysis.

In Utah, 5 areas have been designated as mandatory Class I areas. These areas are: Arches National Park, Bryce Canyon National Park, Canyonlands National Park, Capital Reef National Park, and Zion National Park. PSD Class II areas are essentially all areas that are not designated Class I, and larger incremental increases in concentration are allowed, although the concentrations are not allowed to reach the concentrations set by Federal standards (NAAQS). Air quality data for Class I areas within the study area are also included, where available.

### 3.2.4 VISIBILITY IN CLASS I AREAS

Visibility is "the clarity with which distant objects are perceived" (EPA 2001), and is affected by pollutant concentrations, plume impairment, regional haze, relative humidity, sunlight, and cloud characteristics. A typical visual range without any manmade air pollutants would be about 140 miles in the Western states (EPA 2001). Aerosols (small particles made of solid and/or liquid molecules dispersed in the air) are the pollutants that most often affect visibility in the Class I areas. Five key contributors to visibility impairments are sulfate, nitrate, organic carbon, elemental carbon, and crustal materials. Their relative contributions to visibility impacts in the Canyonlands National Park, a Class I area within the planning area of the FO, are summarized in Table 3.3 (EPA 2001).

**Table 3.3. Summary of Visibility Impairment Pollutants Measured in the Canyonlands National Park <sup>a</sup>**

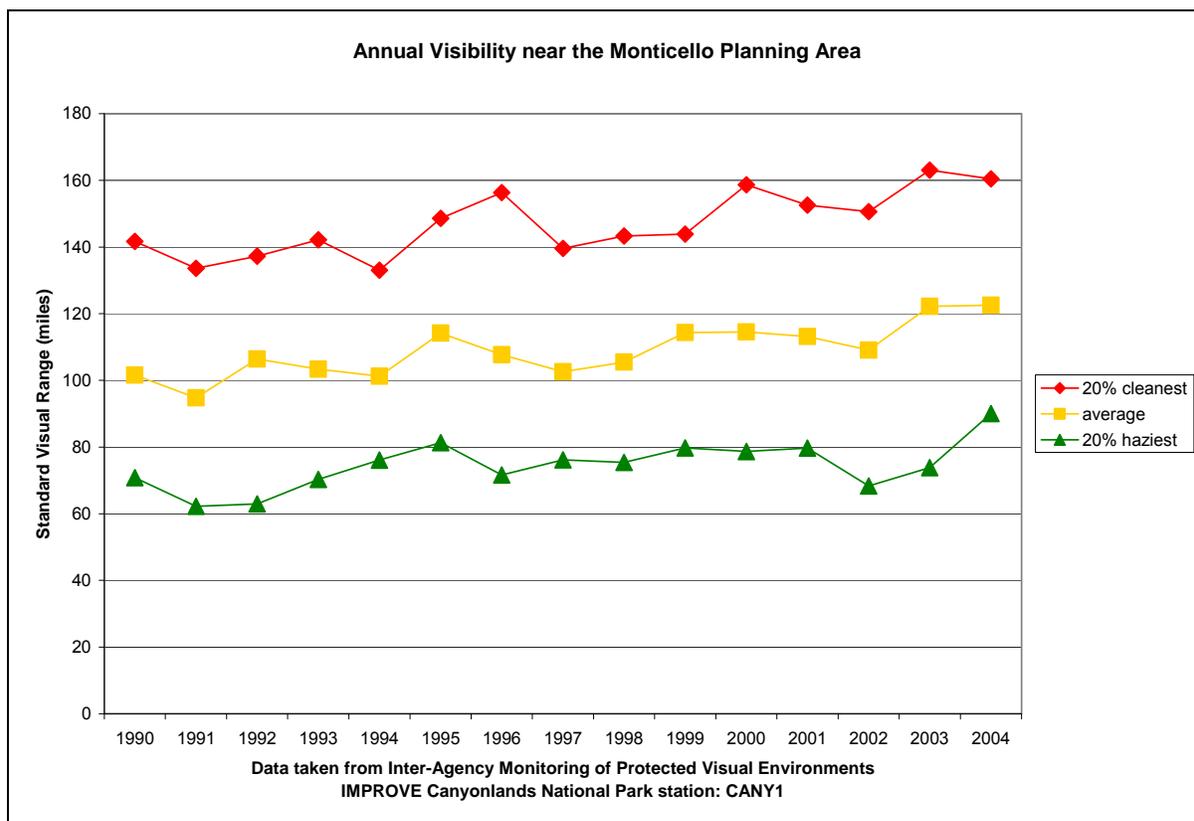
Pollutant	Contribution <sup>b</sup>	Emission Sources
Sulfate	34%	Fossil fuel combustion and forest fires.
Crustal Material	27%	Fugitive dust from roads, agricultural and forestry operations, and wind erosion.
Organic Carbon	22%	Wood burning, open burning, vehicle exhaust, and wildfires and prescribed burning.
Elemental Carbon	10%	Vehicle exhaust, wood burning, and wildfires and prescribed burning.
Nitrate	7%	Motor vehicle exhaust. Secondary sources include fossil fuel combustion and prescribed burning.

<sup>a</sup> Data source: U.S. EPA. 2001.

<sup>b</sup> Contributions are calculated by pollutant concentrations regularly measured in the Canyonlands National Park. Light extinction coefficients and visibility indices are then calculated from these values.

The 1977 Clean Air Act (CAA) included legislation to prevent future and remedy existing visibility impairment in Class I areas. In 1985, the United States Environmental Protection Agency (EPA) established a collaborative monitoring program called the Interagency Monitoring of Protected Visual Environments (IMPROVE) to monitor visibility in Class I areas. The IMPROVE network has operated a monitor in the Canyonlands National Park, located near the western boundary of the Monticello PA, since 1988. The most-impaired days in Canyonlands National Park exhibit visual ranges between 62 to 90 miles and appears to show an improvement over the decade of 1994 to 2004. The mid-range days have visual distances of 78 to 109 miles and show no significant change. The least-impaired days have visibility ranges from 107 to 144 miles and also demonstrate improvements over the decade of approximately 25% (EPA 2003c).

The visibility trend from 1990 to 2004 in the Canyonlands National Park is summarized in Figure 3.3. A more recent assessment of visibility in the Canyonlands National Park indicates that the improvement trend in visibility has continued through 2004, although the trend was measured in different units and was not found to be statistically significant (GPRA 2005). While some visibility impairments are the result of natural sources such as windblown dust and soot from wildfires, which cannot be controlled; manmade sources of pollution can also impair visibility. These include motor vehicles (organic carbon), electric utility and industrial fuel burning (sulfates and particulate), and manufacturing operations (sulfates and fine particulate matter). Visibility in Canyonlands National Park is most influenced by sulfates, fine particulate matter (i.e., dust), and organic carbon. The visibility improvements seen over the past decade are the result of implementing state and federal stationary and mobile source regulations.



**Figure 3.3. Trend in air pollution impacts on visibility observed in Canyonlands National Park, Utah, 1990 through 2004 (IMPROVE).**

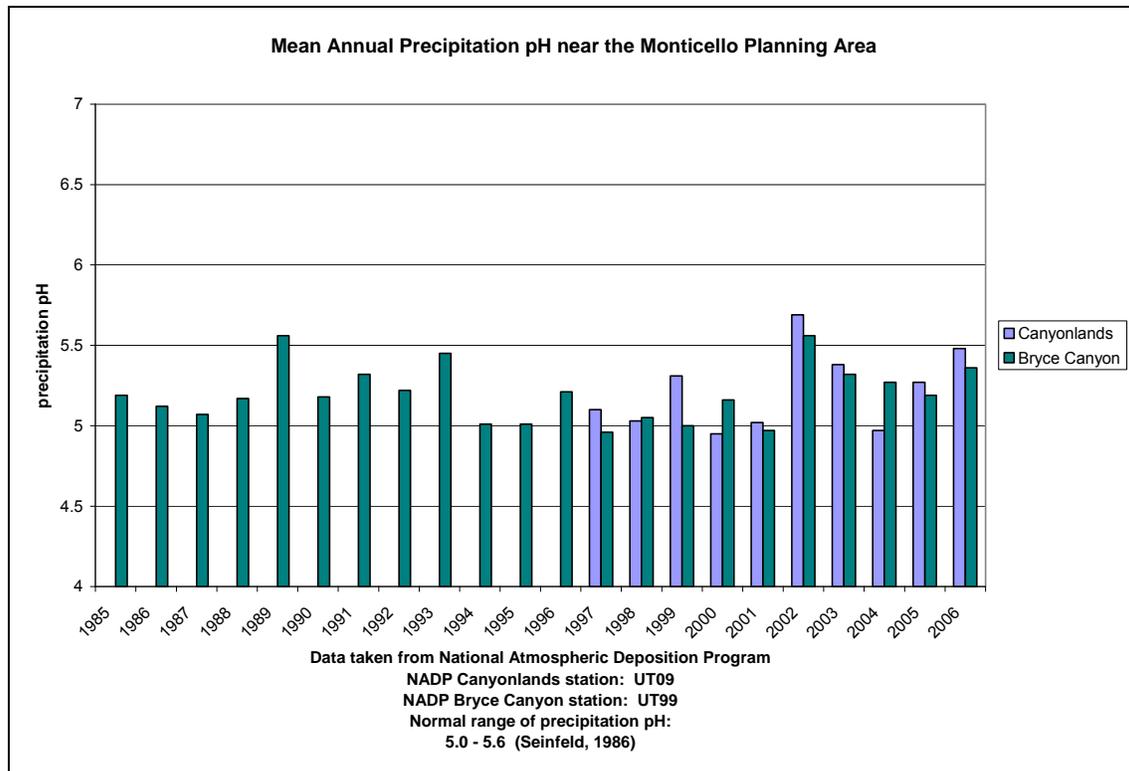
### 3.2.5 ATMOSPHERIC DEPOSITION

Atmospheric deposition refers to the processes by which air pollutants are removed from the atmosphere and deposited on terrestrial and aquatic ecosystems, and is reported as the mass of material deposited on an area (kilogram per hectare - year). Atmospheric deposition can cause acidification of lakes and streams. One expression of lake acidification is change in acid neutralizing capacity (ANC), the lake's capacity to resist acidification from atmospheric deposition. Acid neutralizing capacity is expressed in units of micro-equivalents per liter ( $\mu\text{eq/l}$ ).

### 3.2.5.1 WET DEPOSITION

Wet deposition refers to air pollutants deposited by precipitation, such as rain and snow. One expression of wet deposition is precipitation pH, a measure of the acidity or alkalinity of the precipitation (see Figure 3.4).

There are 5 NADP stations in Utah: Logan, Murphy Ridge, Green River, Bryce Canyon NP and Canyonlands NP. The NADP stations in Bryce Canyon NP and Canyonlands NP have assessed precipitation chemistry from 1985 and 1997 through to the present. Figure 3.4 shows precipitation pH has ranged from 4.95 to 5.69.



**Figure 3.4. Mean annual precipitation pH near in Bryce and Canyonlands National Parks. Data source: National Atmospheric Deposition Program.**

### 3.2.5.2 DRY DEPOSITION

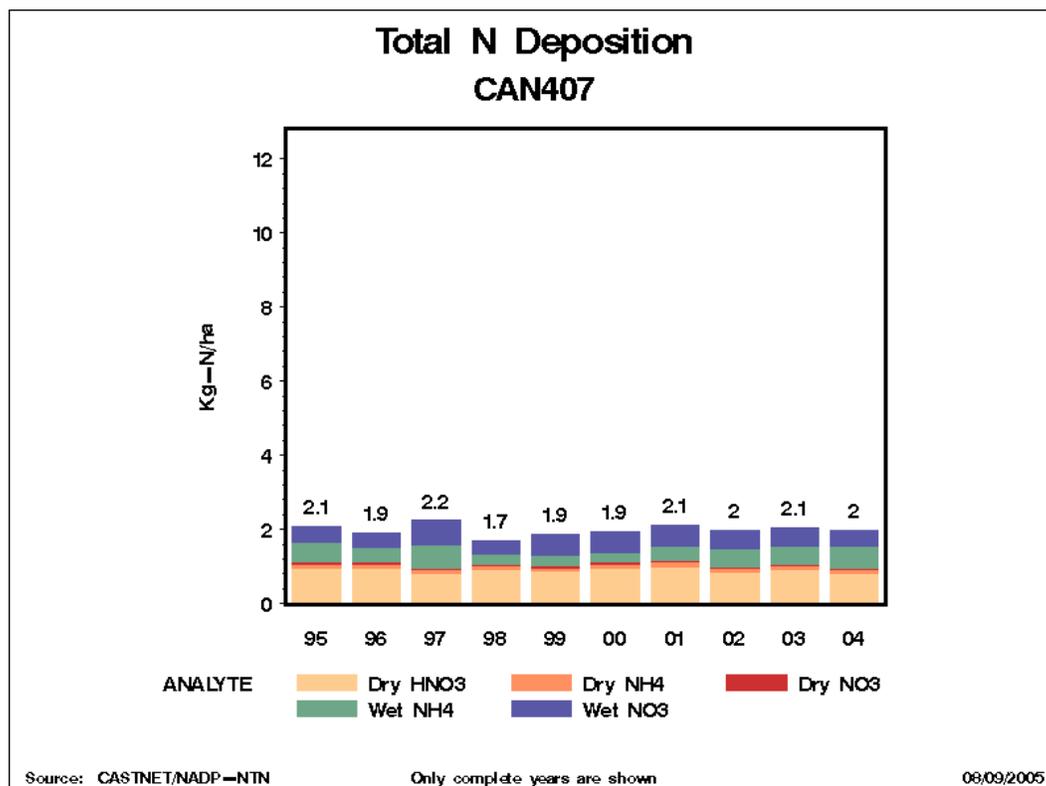
Dry deposition refers to the transfer of airborne gaseous and particulate material from the atmosphere to the Earth's surface. The Clean Air Status and Trends network (CASTNet) has measured dry deposition of ozone ( $O_3$ ), sulfur dioxide ( $SO_2$ ), nitric acid ( $HNO_3$ ), sulfate ( $SO_4^{--}$ ), nitrate ( $NO_3^-$ ), and ammonium ( $NH_4^{++}$ ), in the United States since the late 1980s. There is one CASTNet stations in Utah at Canyonlands NP.

### 3.2.5.3 TOTAL DEPOSITION

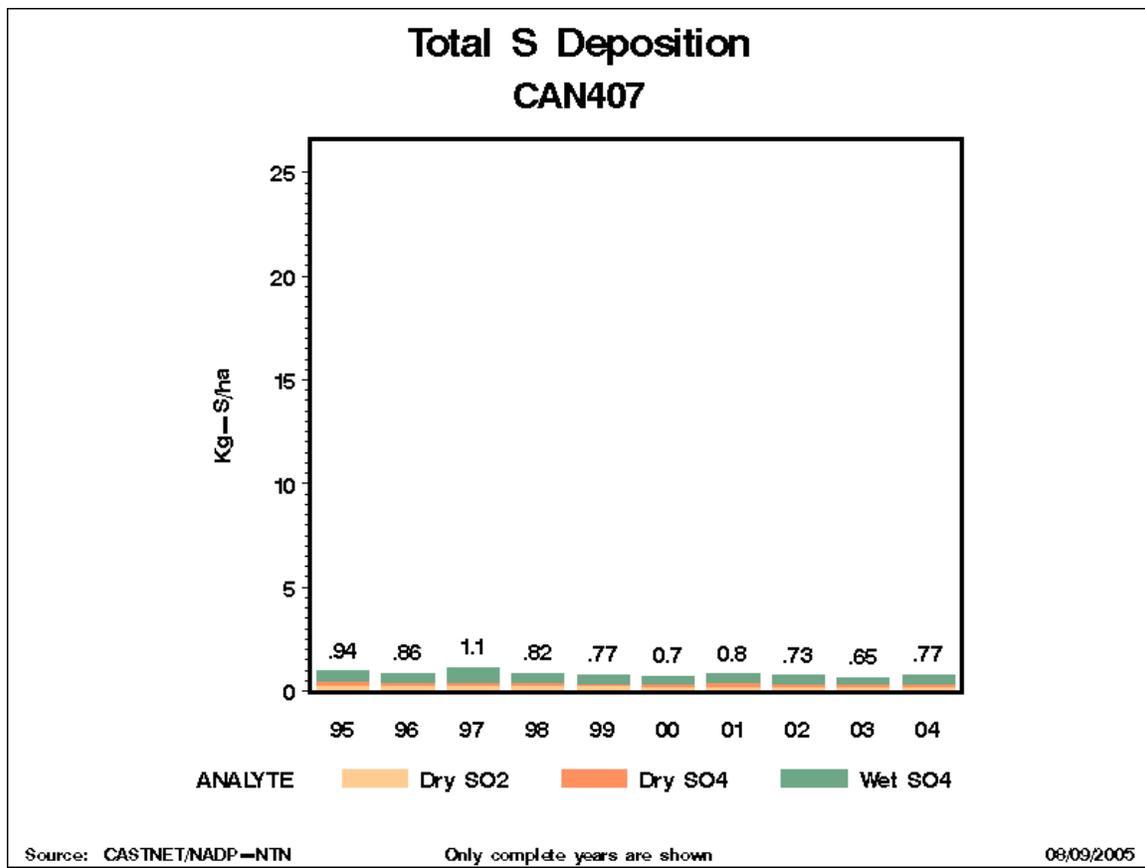
Total deposition refers to the sum of airborne material transferred to the Earth's surface by both wet and dry deposition. Total nitrogen deposition is calculated by summing the nitrogen portion

of wet and dry deposition of nitrogen compounds, and total sulfur deposition is calculated by summing the sulfur portion of wet and dry deposition of sulfur compounds.

Total deposition has been measured at Canyonlands National Park from 1995 through the present. Total nitrogen deposition has ranged from 1.7 to 2.2 kg/hectare-year since 1996 (Figure 3.5). Total nitrogen deposition of 3 kg/hectare-year represents the total pollution loading where acidification is unlikely and "below which a land manager can recommend a permit be issued for a new source unless data are available to indicate otherwise" (Fox, 1989). Studies in Rocky Mountain National Park suggest that acidification may occur with wet nitrogen deposition of 1.5 kg/hectare-year (Baron, 2006). Total sulfur deposition has ranged from 0.66 to 1.1 kg/hectare-year since 1995 (Figure 3.6).



**Figure 3.5. Total nitrogen deposition at Canyonlands National Park. Source: National Atmospheric Deposition Program.**



**Figure 3.6. Total sulfur deposition at Canyonlands National Park. Source: National Atmospheric Deposition Program.**

#### 3.2.5.4 LAKE CHEMISTRY

Atmospheric deposition can cause acidification of lakes and streams. One expression of lake acidification is change in acid neutralizing capacity (ANC), the lake's capacity to resist acidification from atmospheric deposition. Acid neutralizing capacity is expressed in units of micro-equivalents per liter ( $\mu\text{eq/l}$ ). Lakes with ANC values of from 25 to 100  $\mu\text{eq/l}$  are considered to be sensitive to atmospheric deposition, lakes with ANC values of from 10 to 25  $\mu\text{eq/l}$  are considered to be very sensitive, and lakes with ANC value of less than 10 are considered to be extremely sensitive. Based on a search of the EPA STORET database, no ANC data are currently available for Grand and San Juan County. This could be a future consideration in developing monitoring plans.

#### 3.2.6 STATUS OF EMISSIONS

The Monticello PA covers most of San Juan County. Currently, emission sources within the Monticello PA consists mostly of oil and gas development facilities and some mineral processing facilities as identified in Table 3.4.

**Table 3.4. 2005 Emissions Inventory for Grand and San Juan Counties, Utah**

County	Source	2005 Emissions (tons per year)						
		CO	NO <sub>x</sub> <sup>b</sup>	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>x</sub> <sup>c</sup>	VOC <sup>d</sup>	HAPs <sup>e</sup>
Grand County	Area source	206	16	430	88	3	285	
	Non-road mobile	2,962	176	37	30	8	905	
	On-road mobile	8,118	1,042	381	78	16	572	
	Point source	225	378	4	4	<1	69	
	Biogenics	6,596	-	-	-	-	34,973	
	Total Grand County	18,107	1,611	851	200	27	36,803	19
San Juan County	Area source	517	35	1,109	224	35	517	
	Non-road mobile	1,868	59	21	20	11	546	
	On-road mobile	6,657	1,058	399	89	21	470	
	Total San Juan County	9,042	1,153	1,529	332	67	1,533	10
<b>Regional Total</b>		<b>27,149</b>	<b>2,764</b>	<b>2,380</b>	<b>532</b>	<b>94</b>	<b>38,337</b>	<b>29</b>

<sup>a</sup> Emission inventory data from 2005 State Summary of Emissions by Source. URL: [www.airquality.utah.gov/Planning/Emission-Inventory/2005\\_State/05/State\\_List.htm](http://www.airquality.utah.gov/Planning/Emission-Inventory/2005_State/05/State_List.htm)

<sup>b</sup> Nitrogen oxides - one of the main ingredients involved in the formation of ground-level ozone.

<sup>c</sup> Sulfur oxides - contribute to respiratory illness, atmospheric deposition, and the formation of atmospheric particles that can cause visibility impairment.

<sup>d</sup> VOC (volatile organic compounds) refers to any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate that participates in atmospheric photochemical reactions. Also a precursor to ozone.

<sup>e</sup> HAPs (hazardous air pollutants) are generally defined as those pollutants that are known or suspected to cause serious health problems. Section 112(b) of the Clean Air Act identifies a list of 188 pollutants as HAPs. The emissions inventory for HAPs available from the State of Utah only includes those reported by stationary industrial sources.

The 2005 emissions inventory available from the Utah Department of Environmental Quality, Division of Air Quality (UDAQ) was used to characterize base-year emissions in San Juan and Grand County. Emissions are summarized by source type for criteria pollutants including area source, non-road mobile, on-road mobile, point sources, and biogenics. The emission inventory for hazardous air pollutants only includes emissions from stationary industrial sources.

### 3.2.6.1 ADDITIONAL SOURCES OF EMISSIONS

The seasonal windroses presented in Figure 3.2 for Monticello and Bluff (in the Monticello PA) show that prevailing wind speeds rarely exceed 5 m per second, and vary seasonally in direction. Local topography in the Monticello PA is complex and likely to influence local wind patterns to a substantial degree. As meteorological data are not available for all sites within the planning area, the stations at Monticello and Bluff were assumed to be representative of dominant trends

in prevailing wind direction for the northern and southern sections of the Monticello planning area, respectively. Due to the complexity of local topography, this assumption may not hold on a site-specific scale but is expected to be representative when applied as an annual average area-wide trend.

As stated previously, current air quality in the Monticello PA is, with the exception of ozone, consistently below the NAAQS by a large margin, as shown in Table 3.2 (observed ozone concentrations near the Monticello PA is less than, but near, the NAAQS). The Utah DEQ indicated that ozone concentrations in Class I areas of the western states have shown significant increases in the past decade and are approaching the NAAQS level (personal communication between Brock LeBaron, Utah DAQ, and Trinity Consultants on August 8, 2003). Ozone is generally not emitted directly, but forms from a chemical reaction between emissions of volatile organic carbons (VOCs) and nitrogen oxides (NOx) in the presence of heat and sunlight. Sources of VOC emissions include automobiles, gasoline stations, compressor emissions, and many other sources. Nitrogen oxides are emitted from combustion processes in automobiles, power plants, compressors, etc. Although ozone is produced throughout the year, the highest ozone concentrations in most urban areas are usually observed in the summer when strong sunlight and high temperatures drive the chemical reactions. In rural areas of the Rocky Mountain West such as the Monticello PA, high ozone concentrations have been measured in the winter. The processes of this winter ozone are not yet well understood. Stagnant meteorological conditions, such as inversions in some parts of the Monticello PA, can trap the air in the region for several days. Ozone concentrations are generally considered a regional issue. This means that ozone concentrations in a given area can result from emissions that are transported into the area from distant emissions sources, as well as from local emissions sources .

Additional concerns address emissions specific to visitation and through-traffic within the Monticello PA. Most recreational visitors engage in motorized activities that are emission sources in addition to the highway vehicles used for transportation.

Prescribed fire and naturally caused fires also present a concern to air quality. Prescribed burning is a useful tool for resource management and may be used to achieve a variety of objectives such as restoring a fire-dependent ecosystem, enhancing forage for cattle, improving wildlife habitat, preparing sites for reforestation, or reducing hazardous fuel loads. Fire used for any of these management reasons, will produce smoke and other air pollutants. Some short-term air pollutant releases are necessary to achieve the benefits of prescribed burning. Short-term effects on air quality from prescribed burns include a general increase in particulate matter, CO<sub>2</sub> and ozone precursor emissions. Land managers recognize that smoke management is critical to avoid air quality intrusions over sensitive areas or visibility problems. Vegetation management is an active part of fire management techniques and long-term effects of prescribed burning include a reduction in particulate matter, CO<sub>2</sub> and ozone precursor emissions specific to wildfire in unmanaged areas. Prescribed fire management is designed to minimize impacts.

### **3.2.7 GLOBAL CLIMATE CHANGE**

On-going scientific research has identified the potential impacts of climate changing pollutants on global climate. These pollutants are commonly called "greenhouse gases" and include carbon

dioxide, CO<sub>2</sub>; methane; nitrous oxide; water vapor; and several trace gas emissions. Through complex interactions on a regional and global scale, these emissions cause a net warming effect of the atmosphere, primarily by decreasing the amount of heat energy radiated by the Earth back into space. Although climate changing pollutant levels have varied for millennia (along with corresponding variations in climatic conditions), recent industrialization and burning of fossil carbon sources have caused CO<sub>2</sub> concentrations to increase dramatically, and are likely to contribute to overall climatic changes, typically referred to as global warming. Increasing CO<sub>2</sub> concentrations also lead to preferential fertilization and growth of specific plant species.

Global mean surface temperatures have increased nearly 1.0°C (1.8°F) from 1890 to 2006 (Goddard Institute for Space Studies, 2007). However, observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. Figure 3.7 demonstrates that northern latitudes (above 24° N ) have exhibited temperature increases of nearly 1.2°C (2.1°F) since 1900, with nearly a 1.0°C (1.8°F) increase since 1970. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of these "greenhouse gases" are likely to accelerate the rate of climate change.

The Intergovernmental Panel on Climate Change (IPCC) has recently completed a comprehensive report assessing the current state of knowledge on climate change, its potential impacts, and options for adaptation and mitigation. At printing of this PRMP/FEIS, this assessment is available on the IPCC web site at <http://www.ipcc.ch/>. According to this report, global climate change may ultimately contribute to a rise in sea level, destruction of estuaries and coastal wetlands, and changes in regional temperature and rainfall patterns, with major implications to agricultural and coastal communities. The IPCC has suggested that the average global surface temperature could rise 1 to 4.5 degrees Fahrenheit (°F) in the next 50 years, with significant regional variation. The National Academy of Sciences (2006) has confirmed these findings, but also indicated that there are uncertainties regarding how climate change may affect different regions. Computer models indicate that such increases in temperature will not be equally distributed globally, but are likely to be accentuated at higher latitudes, such as in the Arctic, where the temperature increase may be more than double the global average (BLM 2007). Also, warming during the winter months is expected to be greater than during the summer, and increases in daily minimum temperatures is more likely than increases in daily maximum temperatures. Vulnerabilities to climate change depend considerably on specific geographic and social contexts.

The BLM recognizes the importance of climate change and the potential effects it may have on the natural environment. Several activities occur within the planning area that may generate emissions of climate changing pollutants. For example, oil and gas development, large fires, and recreation using combustion engines, can potentially generate CO<sub>2</sub> and methane. Wind erosion from disturbed areas and fugitive dust from roads along with entrained atmospheric dust has the potential to darken glacial surfaces and snow packs resulting in faster snowmelt. Other activities may help sequester carbon, such as managing vegetation to favor perennial grasses and increase vegetative cover, which may help build organic carbon in soils and function as "carbon sinks."

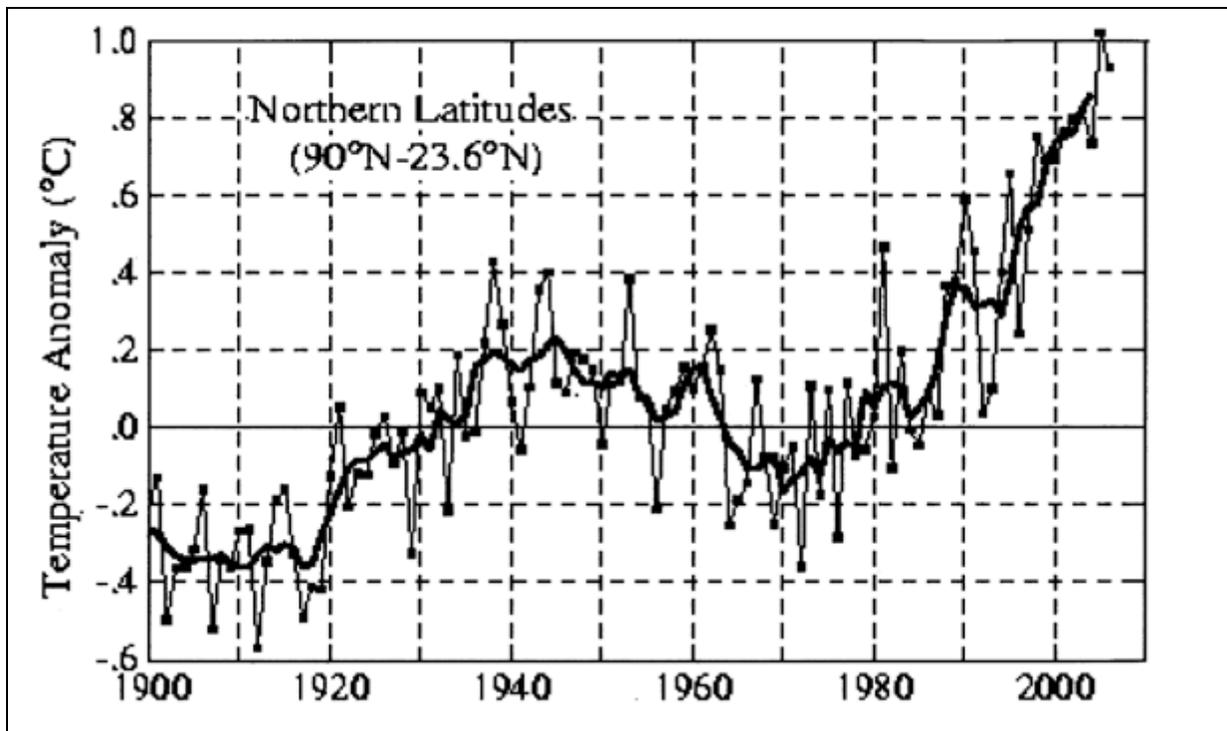


Figure 3.7. Annual Mean Temperature Change for Northern Latitudes (24–90° N).

### 3.3 CULTURAL RESOURCES

#### 3.3.1 OVERVIEW

Cultural resources are non-renewable remains of past human activity. For BLM management purposes, these remains take the form of sites, artifacts, buildings, structures, ruins, features, and natural landscapes with particular cultural importance. With a few exceptions, these remains must be at least 50 years old. In the case of natural landscapes, the period of traditional cultural use must also be at least 50 years old to be considered significant or eligible for or listed on the National Register of Historic Places (NRHP). Cultural resources also include places identified by traditional groups (e.g., Native American tribes) as sacred or otherwise important to the maintenance of group identity even if no physical manifestations of past activities are present at that location. Such locations are referred to as Traditional Cultural Properties (TCPs). Additionally, certain areas of the landscapes have particularly high densities of cultural resources and can be designated as Areas of Critical Environmental Concern (ACECs) with cultural values. This section provides an overview to the culture history of the Monticello PA, as background for understanding the types of cultural resources present. This is followed by an overview to the ethnographic data for the area. Resources are then discussed including a summary of information regarding known resources, potential TCPs, and ACECs with cultural values.

### **3.3.2 CULTURAL RESOURCE HISTORY OF THE MONTICELLO PA**

The following section contains a brief overview of past human activity on lands under the jurisdiction of the Monticello FO. This overview is divided into 3 sections: Prehistory, History, and Ethnography. It is intended only to provide a very broad outline within which to understand the basic types and affiliations of cultural resources that are present within the boundaries of Monticello PA. This overview is not a complete recitation of the entire existing body of knowledge regarding past human activity within the PA. It does not incorporate information from very recent and ongoing investigations (i.e., the condition assessment project at Moon House or excavations in Comb Wash) that are beginning to yield data that may change the existing knowledge of prehistoric land-use patterns, cultural affiliations, and timing of events and trends.

An outline of the prehistory and history of the lands incorporated by the Monticello PA is useful in understanding the broad patterns of human occupation, land use, and habitation that have occurred within the region. Humans of multiple cultures have inhabited, traversed, mapped, and developed these lands for greater than 12,000 years and have left evidence of their activities on the landscape in the form of archaeological sites, buildings, and structures. It is this material evidence that the BLM must consider when making land-use decisions within the PA.

#### **3.3.2.1 PREHISTORY**

Although the precise timing and nature of human entry into North America is currently a matter of considerable debate (Dillehay 1997; Swedlund 1999), the first period of significant recognized human occupation of the continent occurs toward the end of the Pleistocene when the climate was cooler and moister than the present (Jennings 1989:60). This time period is often referred to as the Paleoindian Period and represents the oldest time period for which archaeological evidence exists of human activity in the region. The environmental conditions during this period supported the presence of large game mammals such as giant bison, mammoth, camel, and ground sloth (Grayson 1993). Human populations over much of the continent appear to have concentrated, albeit to varying degrees, on the exploitation of these mammals during this period (Jennings 1989:59; Simms 1988). Few archaeological sites from this earliest period of known human occupation of southeastern Utah have been found within the Monticello PA. The Lime Ridge Clovis site, located 15 kilometers (km) southwest of Bluff, Utah, is a significant archaeological site on the northern Colorado Plateau in Utah (Davis 1989:66). Research conducted in Glen Canyon has also demonstrated a limited human presence during the Paleoindian period (Geib 1996:7). Archaeological evidence from this period tends to be very limited and is often confined to stone tools designed for hunting large game mammals.

The next period of prehistoric occupation in the Monticello PA is typically referred to as the Archaic Period. This period can be subdivided into several phases based on technological (tool kit) differences and different approaches the prehistoric peoples used for obtaining food; though they were still relying on hunting and gathering, they pursued smaller game animals than the previous period. Archaeological sites from this period are more numerous than those from the Paleoindian Period and contain a wider variety of artifacts. Stone tools from Archaic Period sites tend to be smaller and exhibit evidence of being used differently than the spear points Paleoindian peoples used for hunting such animals as mammoth and giant bison. The lands of the

Monticello PA appear to have been very popular for Archaic peoples as archaeological sites from this period are found throughout the FO PA. In fact, the archaeological record for San Juan County indicates widespread occupation of the area between 6000 B.C. and A.D. 100 (Geib 1996:7-9; Nielson 1985). Cedar Mesa, Elk Ridge, and Montezuma Canyon are noted for numerous Archaic Period sites of varying size and complexity. Notable sites include Alkali Ridge, Cowboy Cave, Old Man Cave, and Dust Devil Cave (Brew 1946; Schroedl 1994; Geib 1996:117). Because the peoples of this period were still relying on hunting and gathering, they had to follow migrating animals and seasonally ripening plants across the landscape, and as a result, they left evidence of their activities as numerous small sites located throughout the region.

Following the Archaic Period was the Formative Period. This period differs from the Archaic Period in that Formative Period peoples changed their approach to obtaining food from a strategy based on hunting and gathering wild animals and plants to one in which they began to grow their own food through an early form of agriculture. In the Monticello PA, the Formative Period lasted from A.D. 100 through A.D. 1300. Because the Formative Period peoples spent more time farming, they needed to spend less time pursuing animals and plants. As a result, the archaeological sites they left behind tend to be much larger and have more complex village sites than those of their more nomadic predecessors. Both large village sites and smaller archaeological sites representing the activities of Formative Period peoples are found in very large numbers throughout the Monticello PA.

Within southeastern Utah, the Formative Period has one distinct culture occupying San Juan County: the Anasazi (or *Hisatsinom*, as they are called by the Hopi). This group is hereinafter referred to as the Ancestral Puebloans. The boundaries for the culture are debated; it is known that the Ancestral Puebloans occupied the Four Corners, but the extent of the occupation as far as Las Vegas, New Mexico to Las Vegas, Nevada is debated among professional archaeologists (Geib 1996:98-88; Cordell 1997:196). Table 3.5 presents the chronology of the region during the Formative Period (Jennings 1989:306).

**Table 3.5. Formative Period Chronology**

Period	Date Range
Pueblo IV/V	A.D.1300–1700
Pueblo III	A.D.1100–1300
Pueblo II	A.D.900–1100
Pueblo I	A.D.750–900
Basketmaker III	A.D.450–700
Basketmaker II	A.D.1–500

Two traditions of Ancestral Puebloans are believed to have occupied the southeastern portion of Utah: the Kayenta and the Mesa Verde (Geib 1996:531; McVickar 2001:233). Interactions with Ancestral Puebloan groups to the east southeast (Chaco Canyon) and west (Virgin River Branch) also influenced people in the area. Clear delineation between these groups is difficult due to the nature of regional integration during the Formative period (Geib 1996:99, Varien 1996:11). What

is now San Juan County was the borderland for these two groups. Archaeological sites in the area contain evidence that the two groups interacted with each other (McVickar 2001:232, 233).

It is also hypothesized that during the latter part of the Formative Period, the peoples (Athabaskans) who would later identify themselves as the Navajo and Apache moved into the region (Maryboy and Begay 2000:271). This theory is supported by both linguistic and physical similarities among Northern and Southern Athabaskan groups (Maryboy and Begay 2000:271).

### 3.3.2.2 HISTORY

The written history of the Monticello PA covers a long period from the early Spanish explorers to the recent past. While physical evidence of past human activities during the historic period is present within the FO, much has been lost as a result of subsequent land uses in the same locations. Cultural resource sites from the historic period can be found almost anywhere within the FO boundaries, though most are found around the roadways, communities, and developments that exist today.

The primary impetus for early historic period use of southeastern Utah was trade, and as the most lucrative markets included slaves, horses, firearms, and other wares illegal to trade with Native Americans, few of the earliest expeditions were ever recorded. However, records do exist to demonstrate that Spanish traders were among the first, if not *the* first, Euro-Americans to make use of the lands within the Monticello PA. This use primarily took the form of trade routes passing through the area, and remnants of the Old Spanish National Historic Trail can still be found northeast of Monticello. Such routes were also used and expanded upon by fur trappers and traders who used the area during the early 1800s. Archaeological evidence of trading posts has been found along these trade routes throughout Utah.

As the dominance of the fur trade waned, European traffic through the Four Corners Region took on a different tone. With the settlement of the Salt Lake Valley by the Mormons in 1847, the Church of Jesus Christ of Latter-day Saints (LDS) became a prominent religious and political player in an area that was being more rapidly divided by boundaries and economic interests. In 1854, the LDS church dispatched William Huntington and Jackson Stewart to explore the Four Corners region for possible expansion of Brigham Young's burgeoning religious state, Deseret. As a result of information obtained during the Huntington Expedition, the Elk Mountain Mission of 1855 was executed in the La Sal Mountains. As the Elk Mountain Mission spread south into the San Juan River drainage to establish relations with the Navajo Nation, the resources of the mission were spread thin. Many of the tribes grew disdainful of the LDS presence, and after a number of the mission party members were killed the project was generally abandoned. Limited, if any, archaeological evidence of these early interactions between the LDS church and Native American groups is likely to be present within the FO.

In 1875, the U.S. made its first real indication of territorial interest in the region by sending U.S. Geological Survey teams lead by James L. Gardiner and Henry Gannet, under the direction of Ferdinand V. Hayden, to survey the La Sal Mountains. After two weeks, the Hayden Expedition of 1875 shifted attention to the Abajo Range whereupon they fell under attack by a band of Utes. They were forced to abandon their equipment in Peters Canyon, at an archaeological site that has

been identified. Much of their equipment has since been recovered, and is archived at the University of Wyoming (Pierson 1980:82).

By the late 1800s, relatively large numbers of settlers of the LDS church had been sent to southeastern Utah to colonize the area. The green valleys of the San Juan River, Colorado River, and Green River drainages became attractive destinations for cattlemen seeking to graze herds destined for sale in the new markets of the west. The first cattle were grazed in the valleys of the region in 1874 (Pierson 1980:88-90). Little archaeological evidence of this early cattle grazing is likely to be present on BLM lands in the FO as many such homesteads/ranches now exist on private lands. The same such condition would exist for agricultural communities and farmsteads established by pioneers who settled the region alongside and after the cattle ranchers. Irrigation ditches, holding ponds, and rows of poplar trees planted as wind breaks are scattered across the southeastern Utah landscape, though again mostly on private lands.

By the 1890s, placer mining in the Abajo Mountains began to draw prospectors (Pierson 1980:91). Within a few short years, silver, copper, and other minerals drew almost equal attention. Even uranium and related deposits of vanadium and carnotite attracted some speculative interest, but would not be of much regional importance until after atomic weapons had been developed. Archaeological evidence of these and later mining efforts are known to exist with the Monticello PA.

Into the twentieth century, growth was slow and steady, limited by the nature and degree of industries to which the land was suited. World War I had minor influence upon San Juan County's economy, as did the Great Depression, which may have had a positive effect upon the towns of the region. Southeastern Utah was sparsely populated and, lacking a well-developed economic foundation, there was little to be affected by a national economic downturn. As the U.S. pulled out of the Great Depression and resumed normal life, San Juan County started an economic transition. World War II had attracted the support of tribal members and European Americans alike, but aside from exposing the residents of southeastern Utah to new skills and various parts of the world the economy was affected very little. The detonation of two nuclear weapons on Japanese soil changed the regional economy in a way far greater than any other single factor had to this time.

Uranium, once a mineral of minimal economic importance, became a commodity in an international arms race. In 1952, Charles Steen discovered the Mi Vida mine in Big Indian Canyon (McPherson 1995:256). Subsequent discoveries resulted in the opening of a uranium mill outside Moab in 1956 (Pierson 1980:100). The population of southeastern Utah multiplied exponentially, and as more lands were consolidated under subsurface mineral rights and homes were constructed for the new arrivals, farming and ranching industries began to decline. Despite the poorly understood, but formidable, health risks associated with uranium mining and milling, the economy of the region grew exponentially.

By this time, more Americans took to the highways than ever before. Interstate roadways developed since the 1920s were refined, automobiles were nearly perfected, fuel was inexpensive, and families enjoyed surplus incomes. As mining, ranching, and agriculture declined, southeastern Utah's tourism industry expanded. Arches National Monument was turned

into a National Park, and was joined by Canyonlands (Pierson 1980:101). The completion of the Glen Canyon Dam in 1963 created a vast manmade reservoir that attracts fishermen, houseboat and water sport enthusiasts.

With tourism came a need for more federal employees to play host to visitors and, as a result, a new economy began to form. Support industries evolved in and around population centers and along highways. The trends following the 1950s have not changed dramatically, but continue to expand as southeastern Utah becomes an increasingly popular location for residents of Salt Lake City, Denver, and surrounding areas who frequently visit the valley for mountain biking, climbing, off-road vehicle recreation, and sight seeing. The economy of San Juan County, derived primarily from use of public lands, has become more than a regional issue. General concern from environmental interest groups, outdoor recreationists, and community leaders seeking to enhance the interests of their residents has resulted in numerous attempts to sway national law in one direction or another. As these issues are refined through discussion, San Juan County's population follows seasonal fluctuations dictated by the peaks and valleys of the tourist industry.

### **3.3.3 ETHNOGRAPHIC DATA**

The history and concerns of individual tribes and tribal groups are detailed and complex and beyond the scope of summary in this document. A separate, comprehensive ethnographic overview is being prepared in conjunction with the current updating of the Monticello FO Resource Management Plan (RMP) and will provide field office cultural resource specialists and managers with in-depth descriptions of the claims to, concerns about, and importance ascribed to lands within the Monticello PA (Molenaar et al. [in progress]). This stand-alone document will be a companion to the new RMP and will be used in making decisions regarding land uses contained in or permitted by the RMP.

For the purpose of this chapter, ethnographic summaries and a discussion of potential site types to which tribes may ascribe religious or cultural values are provided in the following sections. These summaries outline what is currently known about concerns individual tribes have regarding management of lands within the Monticello PA and note the types of resources that have been identified as sacred or of traditional importance to the individual tribes.

#### **3.3.3.1 UTE MOUNTAIN UTE AND WHITE MESA UTES**

The aboriginal territory of the Ute once covered an extensive area that included what is now Colorado, Utah, and New Mexico. Of the 3 bands that make up the Southern Ute populations (Muache, Capote, Weenuche), the Weenuche (Ute Mountain Utes and White Mesa Utes) inhabited the Monticello PA. They ranged from the Dolores River in the east, to the Colorado River in the north and west, to the San Juan River in the south. There are few diagnostic indicators, such as distinctive pottery or wickiup sites, which provide proof of Ute occupation in the San Juan region of Utah and Colorado. Utes tended to utilize existing structures and leave few cultural markers behind upon leaving an area. However, ethnographic data place the Utes in the San Juan region at least since the 1500s.

Utes place religious and traditional importance on many land features throughout southeastern Utah. Significant places of traditional use include Water Canyon or River-Flowing-From the Sunrise (San Juan River), Sagebrush Canyon or Crows Canyon (Montezuma Canyon), Slick Rock Mound (Comb Ridge), Two Rocks Canyon (Cow Canyon), Where-the-Sun-Sets-Last (Mount Tukuhtnikivats in the La Sal Mountains). Bitter Root Mountain (Sleeping Ute Mountain) and the Colorado River are mythical places. Blue Mountain and Standing-Alone-Mountain (Navajo Mountain) are considered to be places of worship to the Utes. Mancos (Jim) Mesa and Spanish Mossback Mesas were used in historic times as Ute fortresses in times of conflict (McPherson and Yazzie 2000). Historically, the Bear Dance, a spring ceremony symbolic of nature's awakening, was performed in Bluff, Montezuma Canyon, and Allen Canyon. Today the ceremony takes place in the fall in White Mesa; however, the Utes may ascribe cultural significance to these historic ceremony locations.

### 3.3.3.2 PAIUTE TRIBES

San Juan County is considered to be on the periphery of traditional Paiute territory that extended across southern Utah and Nevada, northern Arizona, and down along the western side of the Colorado River into California. The Monticello PA is east and north of traditional Paiute territory, although the San Juan Band Paiutes may have used resources along the San Juan River in what is now the boundary between San Juan County and the Navajo Reservation (Kelly and Fowler 1986; McPherson and Yazzie 2000). There are no known places of religious or traditional importance to the Paiute on lands managed by the Monticello FO. The Paiute Indian Tribe of Utah has indicated an interest in the traditional plant usage of the San Juan region.

### 3.3.3.3 THE HOPI TRIBE

The Hopi have rich oral traditions that tell of Hopi clan migrations throughout the Southwest, including southern Utah (Schroeder 1985). Archaeological evidence places the Hopi's ancestors originally within the San Juan region of the Southwest. Sometime during the end of the 1200s, a prolonged drought forced these people to move away from the area towards the north, west, south, and east. After several generations, the people continued their migrations, eventually settling on the southern escarpment of Black Mesa in northeastern Arizona. In present times, Hopi clans continue to inhabit and practice agriculture in Black Mesa country (Ferguson et al. 1993; Brew 1979; Courlander 1971).

Places of religious and traditional importance for the Hopi have not been identified in the Monticello PA. However, the Hopi claim to be culturally affiliated with the occupants of prehistoric places such as habitation sites, pictograph sites, or petroglyph sites. These occupants are known in the scientific community as Paleoindian, Archaic, Fremont, and Anasazi but are known to the Hopi as *Motisinom* (First People) and *Hisatsinom* (Ancient Ancestors) (Ferguson 1997; Newton 1999). The Hopi Cultural Preservation Office does claim cultural affiliation to archaeological sites within the Monticello PA.

### 3.3.3.4 PUEBLO OF ZUNI

The Pueblo of Zuni is located in a part of western central New Mexico that has been inhabited by ancestors of the Zuni since A.D. 700 or 800 (Woodbury 1979). Like the Hopi, the Pueblo of Zuni claims traditional cultural use of areas far from their present-day reservation (Ferguson and Hart 1985). The Zuni claim stewardship over all lands upon which they hunted, collected materials such as plants and minerals, or traveled regularly to trade. Zuni forbearers especially journeyed great distances for the purpose of collecting materials for ceremonial purposes. Traditional hunting and gathering areas extended as far south as the Mogollon and Gallo Mountains in southwestern New Mexico and westward into Arizona (Ferguson and Hart 1985). It should be noted that this area does not extend into present-day Utah; however, like the Hopi, the Zuni claim cultural affiliation to the Paleoindian, Archaic, Anasazi, and Fremont peoples (Pueblo of Zuni 1995). Therefore, all prehistoric or ancestral Puebloan sites within the Monticello PA are considered by the Zuni as places of traditional importance (Panteah and Zuni Cultural Resources Advisory Team 1997).

### 3.3.3.5 NAVAJO NATION

Navajos are believed to have entered the southwest during the mid-to-late 1500s and into southern Utah by the 1700s. Their traditional lands covered the area bounded by the 4 sacred mountains that are of primary religious and sacred significance to the Navajo: Blanca Peak, Mount Taylor, the San Francisco Peaks, and the La Plata Mountains (Maryboy and Begay 2000). Today, the Navajo presently occupy a reservation that is roughly 25,000 square miles and covers much of northeastern Arizona, northwestern New Mexico, and a small portion of southern Utah. The northern border of the Navajo Reservation borders the Monticello PA.

The earliest known Navajo site in San Juan County is a hogan in White Canyon, west of Bear's Ears, dating to 1620. Early Navajo expansion into the Monticello PA is also supported by a Navajo petroglyph at Bluff, Utah, which is in an eighteenth-century style. Navajos also attach cultural significance to 3 mountains in Utah that are mentioned in Navajo rite-myths: *Dzil Diloi* (Abajo Peaks), *Naatsisaan* (Navajo Mountain), and *Shash Jaa* (Bear's Ears) (Gilpin 2001; Packak et al. 1992). Recently, the Navajo claimed the Colorado River watershed, including the Green River, as a place of religious and traditional importance based on creation stories (Molenaar 2003c).

### 3.3.3.6 PUEBLO OF JEMEZ

The Towa-speaking Jemez people are thought to have migrated with the ancestors of the Zia into the Jemez Mountains around A.D. 1250, eventually settling into the valley along the Jemez River (Ford et al. 1972; Ellis 1956; Sando 1982). Jemez people believe that their ancestors came into this world at *Hoa-sjela*, or Stone Lake, a place located on the present-day Jicarilla Apache Reservation in northwestern New Mexico (NAU and SWCA 1996). Although no places of religious or traditional importance to the Pueblo of Jemez have been identified in the Monticello PA, Jemez religious leaders are thought to have made treks to an emergence shrine at "Banana Mountain" which may be another name for Sleeping Ute Mountain (Ellis 1967:40).

### **3.3.3.7 PUEBLO OF ZIA**

The Zia are thought to have migrated southward from southwestern Colorado into the Greater Mesa Verde and Chaco Canyon regions and claim both areas as ancestral homes. By the late 1300s, Zians had settled in a series of sites along the Jemez River, where they eventually settled (Ellis 1956, 1967). The Zia pueblo originally consisted of 5 villages in the 1500s, but their numbers were reduced following the Pueblo Revolt of 1689. Today, the Zia Pueblo consists of one village and two separate land parcels, is presently situated along the Jemez River, 30 miles north of Albuquerque. The Pueblo of Zia, like other Pueblos, claim cultural affiliation to prehistoric cultures of southeastern Utah based on ancestral migration and origin stories. The Pueblo of Zia has consulted with the Monticello FO on cultural resource issues but has not identified any places of religious or traditional importance.

### **3.3.3.8 PUEBLO OF ACOMA**

Acoma is a Keresan-speaking pueblo located 20 miles southeast of Grants in north-central New Mexico. Prehistoric Acoma culture ranged from the plains of eastern New Mexico, to the Zuni Mountains in the west, to the Rio Puerco in the east, and to the north of Mount Taylor (Holmes 1989). Like other Pueblos, Acoma oral traditions tell of their ancestors as having emerged from under the earth at *Shipap*, their place of origin in the north. Archaeological data such as pottery dating and oral traditions hold that Acoma has been occupied since prehistoric times, possibly as early as A.D. 700 (Ruppe 1990; Ruppe and Dittert 1952) with a later mix of migrants arriving from Mesa Verde, Chaco Canyon, and possibly the Gila and Cebolleta regions around A.D. 1300 (Horr 1974; Ellis 1974). Like other Pueblos, the Pueblo of Acoma claims cultural affiliation to prehistoric cultures of southeastern Utah based on their migration stories. The Pueblo of Acoma has consulted with the Monticello FO on cultural issues but has not identified any places of religious or traditional importance.

## **3.3.4 CULTURAL RESOURCE OVERVIEW**

More than 25,000 cultural resource sites have been documented thus far in all of San Juan County. An estimated 60–65% of all of these sites are located on public lands, with the majority of these being under the jurisdiction of the BLM Monticello FO. The BLM's management responsibility for the archaeological record of San Juan County grows significantly each year. During the 16 years since the completion of the existing RMP (BLM 1991a), an average of 450 new cultural resource sites have been documented each year in San Juan County. Most of these sites were identified as a result of the Section 106 process of the National Historic Preservation Act of 1966 (NHPA) associated with applications for use of public lands. In order to make sound management decisions regarding land uses, cultural resource specialists and managers within the Monticello PA must understand how cultural resources are distributed across the landscape, which types of cultural resources are present within the FO PA, and which portions of the FO PA have been subject to cultural resource inventories, and which areas have not. At the present time, no comprehensive overview of known cultural resource sites and cultural resource survey projects conducted to-date within the Monticello PA exists. The Monticello FO recognizes the need for such an overview and is currently pursuing its preparation in conjunction with the RMP revision.

While thousands of cultural resource sites may be found eligible for listing on the NRHP, only an extremely small percentage are ever actually formally nominated and listed on the Register. Of the known sites within the Monticello PA, 7 are listed on the NRHP as either individual entities or as part of a larger archaeological district or National Historic Landmark. Table 3.6 summarizes these sites.

**Table 3.6. National Register–listed Sites and Districts, National Historic Landmarks, and National Monuments within the Monticello PA**

Site Number/Name	Year Designated	Acreage Included	Status
Alkali Ridge	1985	2,340 acres	National Historic Landmark
Big Westwater Ruin	1974	< 1 acre	National Register–listed site
Hole-in-the-Rock Trail, Dance Hall Rock	1980	40,300 acres linear corridor	National Register–listed site
Sand Island Petroglyph Panel	1980	< 1 acre	National Register–listed site
Newspaper Rock Petroglyph Panel	1976	< 1 acre	National Register–listed site
Butler Wash	1981	2,025 acres	National Register–listed archaeological district
Grand Gulch	1982	4,240 acres	National Register–listed archaeological district

While there have been many inventories for cultural resources in the Monticello PA, there are significant gaps in the database that have increased the difficulty in management of these resources. These limitations include large unsurveyed areas where there is no current knowledge about cultural resources, gaps in the database of particular site types, and research-related data limitations. Despite the many cultural resource inventories within the Monticello FO PA, the total percentage of the area covered has been relatively small. While a systematic audit of surveyed and as-yet unsurveyed lands within the Monticello PA is beyond the scope of this document, a cursory review of previous project location mapping available at the Utah State Historic Preservation Office (SHPO) suggests that less than 10% of all BLM lands within the Monticello FO PA have been subjected to intensive-level cultural resource inventories. As a consequence, there are still large areas for which there is no current information regarding the numbers, types, and distribution of cultural resources.

Further, the majority of previous cultural resource inventories within the FO PA have been driven by Section 106 compliance related to specific development or land-use projects. These inventories have addressed discrete locations and have typically resulted in the "clearance" of small parcels of land and narrow linear corridors. As such, much of the current understanding of site types and their distributions, as well as of prehistoric and historical land-use patterns, is based on piecemeal information gleaned from this patchwork of small, disparate surveys.

### 3.3.5 POTENTIAL TRADITIONAL CULTURAL PROPERTIES

Consultation with Native Americans can result in the identification of traditional cultural properties (TCPs), which are physical locations of importance to the cultural identity or history of a living community of people today. Based on previous consultations with tribal organizations, the following TCP site types have the potential for being identified in the Monticello PA.

#### 3.3.5.1 ARCHAEOLOGICAL SITES

Many Native American groups claim affiliation with prehistoric archaeological sites such as rock art, burials, and village sites. The Hopi Tribe, for example, claims that often the exact locations of some of these places, such as ancestral archaeological sites and burials, are unknown to tribes until these sites are identified by Hopi cultural experts during ethnographic or ethnohistoric investigations or by archaeologists during archaeological investigations of a given study area. Not only do the Hopi consider these sites to be TCPs, they also believe that they are historic properties eligible for inclusion on the National Register under Criteria A, B, C, and D for the following reasons:

- **Criterion A** because they are associated with the Hopi clan migrations, which have made a significant contribution to the broad patterns of Hopi history.
- **Criterion B** because they are "associated directly with Ma'saw and the Hopis' covenant to leave their footprints across the land."
- **Criterion C** because "ancestral archaeological sites, that may be individually anonymous, are identified as part of the great clan migration that are central to all that is Hopi."
- **Criterion D** because they have yielded or have the potential to yield information important to Hopi prehistory (Ferguson 1997; Hopi Cultural Preservation Office 1995).

Other tribes also consider ancient Native American archaeological sites as places of traditional importance. For example, the Zuni have identified all "ancestral" archaeological sites as places of traditional importance, as well as being eligible for inclusions on the National Register (Anyon 1995; Hart 1993:40). They say that these sites meet Criteria A and B (as outlined in National Register Bulletin 15) because of their association with the Zuni ancestors and their oral migration histories (Panteah and Zuni Cultural Resources Advisory Team 1997). The Utes also consider some of these sites to be culturally significant and sacred and maintain that the spirit of their ancestors dwell at archaeological sites and will remain as long as the sites are not disturbed (Newton 1999; Perlman 1998). Recently, a spiritual leader of the Uintah and Ouray Ute Tribe has stated that the disturbance of significant archaeological sites is leading to the destruction of Ute religion and diminishing the power of the spirits that remain at these sites (Molenaar 2003a).

#### 3.3.5.2 ROCK ART SITES

Many tribes have strong spiritual convictions regarding petroglyphs and pictographs and usually request that these sites not be disturbed, especially if the site was created with the intention of connecting with a spiritual or natural power. Many Ute and Puebloan groups also believe that rock art created by their ancestors retains the spirits of their ancestors. The Hopi Cultural

Preservation Office has ascribed cultural values to Fremont rock art panels as far north as Nine Mile Canyon in the Price Field Office area (Molenaar 2003b).

Rock art panels are also seen by tribes as physical evidence of Native American land use indicating territorial boundaries, hunting and camping sites, and trail or migration markers. It is generally accepted by Native Americans that some panels depict tribal stories and legends and that only those with special cultural knowledge can interpret them. In the past, Utes have derived spiritual powers and authority from special petroglyph panels for their Bear Dances (Spangler 1995:775). In the course of Section 106 consultations, the Uintah and Ouray Ute Tribe often request one-half mile buffers around rock art panels, if possible (Molenaar 2003b).

### **3.3.5.3 ROCK SHELTERS**

Rock shelters and cave sites located within the Monticello PA can potentially be identified as TCPs. These locations include overhangs, crevices, and cave sites and are significant to Native Americans as ancestral dwellings. These site types are also potential ancestral grave sites for the Ute Tribe (Pettit 1990). These sites also may be identified as places where Native Americans communicated with the supernatural world by means of prayer, offerings, and vision quests (Molenaar 2003a).

### **3.3.5.4 NON-ARCHAEOLOGICAL SITE TYPES**

Non-archaeological site types are distinguished from archaeological site types in order to discuss places that are not necessarily associated with prehistoric or historic artifact assemblages and collections. These sites are typically identified by tribal representatives during the government-to-government consultation process that is required of federal agencies. Some common site types are lakes and springs, land features, and traditional gathering or collection areas.

#### **3.3.5.4.1 LAKES AND SPRINGS**

Native Americans often claim places of water as places of traditional importance and have traditional stories about mythical beings or water spirits that live in lakes, springs, and rivers. The Colorado River and its tributaries have sacred significance to the Navajo. The Colorado, Green, and Price rivers have been identified as sacred to the Navajo because they come from natural spring water and also because the Colorado River flows from the north and can be associated with some of the Navajo creation stories. According to the Navajo, when the Green River is impacted, the cultural integrity of the spring water is affected, which in turn affects traditional procurement use values (Molenaar 2003c).

#### **3.3.5.4.2 TRADITIONAL GATHERING OR COLLECTION AREAS**

Traditional plant or other resource gathering areas may be places of traditional importance to Native American groups. These areas are generally places where Native Americans go to collect resources such as medicinal plants used and minerals to be used in ceremonies and are often in current use when identified. Within the Monticello PA, such resources include green willow

found in riparian areas throughout the FO, and a variety of other plant resources, including firewood, gathered from Cedar Mesa (Molenaar et al. 2005).

### 3.3.5.4.3 LAND FEATURES

Large geographic regions, such as deserts, mountain ranges, and valleys are often identified as TCPs but none have been formally documented as such. Examples of such types of places near the Monticello PA are Sleeping Ute Mountain and the Henry Mountains.

### 3.3.6 DESIGNATED ACECs WITH CULTURAL RESOURCE VALUES

Under the existing RMP (BLM 1991a), approximately 362,920 acres were designated as ACECs based upon combinations of the use categories described above (see Table 3.7). Additionally, clusters of sites comprising approximately 357,780 acres were identified as desirable for nomination to the National Register as archaeological districts, primarily for their scientific and conservation use values (Table 3.7). Four cultural resource sites comprising a total of 13 acres were identified as desirable for nomination to the National Register as individual listings owing primarily to their allocation to the scientific, conservation, and traditional use value categories (Table 3.8).

Management of the Grand Gulch area and Cedar Mesa ACEC is currently governed by the Grand Gulch Plateau Cultural and Recreation Area Management Plan (BLM 1993c). This plan provides for: 1) the formation of a PA archaeological committee to identify important research questions relevant to the archaeological record of the area; 2) active consultation with the Navajo Tribe, Ute Tribe, Hopi Tribe, Zuni Tribe, All Pueblo Council, San Juan County Historical Society, and Four Corners Heritage Council; 3) archaeological surveys based on the likelihood of impacts to National Register eligible sites; 4) stabilization of select ruins; 5) restrictions on and issuance of special area use permits for commercial and non-commercial use; 6) the development of an interpretive plan to educate visitors about the cultural resources of the area; 7) monitoring to assess impacts to archaeological resources; and 8) development of a public affairs plan related to the area. Specific management prescriptions are also outlined for individual units within the larger FO PA.

**Table 3.7. ACECs with Cultural Resource Values Designated by the Monticello FO**

ACEC Name	Year Designated	Acreage Included	Justification
Alkali Ridge	1991	35,890 acres	Significant diversity of cultural sites; large Pueblo I sites (A.D. 700–900) in this area are part of the Alkali Ridge NHL. Large pueblos with complex architecture and connecting prehistoric roads are included in this diverse cultural landscape. This unique Historic Landmark is significant in the history of archaeology in the southwestern U.S. This ACEC has high scientific and conservation use values.
Cedar Mesa	1991	323,760 acres	This ACEC contains a wide array of cultural resources reflecting most of the history of human use of southeastern Utah. Basket Maker -Pueblo I

**Table 3.7. ACECs with Cultural Resource Values Designated by the Monticello FO**

ACEC Name	Year Designated	Acreage Included	Justification
			interface sites (pre-A.D. 1 to A.D. 700), terminal Pueblo III occupations (ca. A.D. 1300), plastered rooms in buildings associated with the Pueblo III occupations (A.D. 1100 to 1300), prehistoric roads, the historic Hole-in-the-Rock Trail, and pioneer era sites are all represented within this ACEC. The ACEC also has high Native American traditional uses and values as well as scientific, conservation, and public values.
Shay Canyon	1991	1,770 acres	This ACEC contains significant rock art associated with Archaic and Pueblo motifs as well as important paleontological resources including at least one dinosaur track way. The ACEC has high public and conservation use values.
Hovenweep	1991	1,500 acres	This ACEC contains large structural Pueblo II–Pueblo III sites (A.D. 850–1300), a terminal Pueblo III occupation (ca. A.D. 1300) as well as evidence of interaction with the Mesa Verde Anasazi population. The ACEC has high scientific, public, and conservation use values.

**Table 3.8. Sites and Districts Identified in the 1991 RMP for National Register Listing**

Name	Acreage Included	Site or District
San Juan Prehistoric Roads	500 acres	District
Cedar Mesa	349,640 acres	District
Fable Valley	5,030 acres	District
Tin Cup Mesa	2,610 acres	District
Ruin Spring	10 acres	Site
Kachina Panel	1 acre	Site
Monarch Cave	1 acre	Site
Three Story Ruin	1 acre	Site

## 3.4 FIRE MANAGEMENT

### 3.4.1 INTRODUCTION AND RESOURCE OVERVIEW

The Monticello PA is within the BLM Moab Fire District, which consists of approximately 6.5 million acres of public land interspersed with state, private, and other federally regulated lands throughout Carbon, Emery, Grand, and San Juan counties. The divergent elevations throughout the area support a wide range of vegetation and soil types including riparian areas, forested high mountain watersheds, grasslands and shrublands, and sparse, arid desert sands. During a normal

fire year the entire district averages 100 wildfires resulting in 10,000 to 16,000 acres each year of burned and potentially damaged land. Most fire activity occurs in the eastern half of the district, although fires can occur in almost all areas of each field office. In the 25-year period between 1980 and 2005, approximately 74% of wildland fires occurring in the entire Moab Fire District were caused by lightning. Prior to 1995, an average of 100 fires per year burned an average of 10,000 acres per year. The past decade has shown a trend of increasing wildland fire, with an average of 130 fires each year burning an average of 16,000 acres each year.

Wildland fire occurrence and size can depend on a range of factors including elevation, vegetative community, fuel moisture, precipitation and/or a lack of precipitation, the ability of fire to carry in specific types of vegetation, and other climate dynamics such as dry summer weather following a wet spring or extended periods of drought. Human-caused fires in the Monticello PA are negligible, but may occur near roads from vehicle ignitions and/or in camping areas outside of designated campsites such as along the San Juan River corridor. Resource values threatened by fire include recreation sites, oil/gas sites, cultural sites, watersheds, wildlife habitat and wildland-urban interface areas. High intensity fires that cover large acreages have occurred in almost all areas, although 90% of the wildland fires in the Moab Fire District are less than 10 acres. Depending on climatic conditions, a typical fire season stretches from March through October with the peak occurring in the lightning-prone period from mid-June to mid-August.

The Moab Fire District has a wide variety of fuel types comprised of numerous species such as grassland mixes, sagebrush and sage/grass, brushland/grass, pinyon/juniper, ponderosa pine, mountain brush, mixed conifer, and invasive species including cheatgrass, tamarisk and others. The affect of wildland fire or the absence of fire in these vegetative communities is closely tied to other public lands resources such as watersheds, soils, wildlife, and livestock grazing. Historically, fire was essential to a healthy ecosystem, providing the needed regeneration of some species and promoting diversity of other species in riparian areas, grasslands, shrublands, woodlands, and forests. The exclusion of fire over the past century, in combination with other land management practices, has compromised the health of many vegetative communities. Two of the predominant issues in the Monticello PA are the loss of shrubland and grassland communities to pinyon/juniper encroachment, and the spread of prolific invasive species.

Communities surrounded by these compromised ecosystems are becoming increasingly susceptible to wildland fire with an accompanying threat to lives and property. Communities in need of management action to reduce the threat from wildland fire on adjacent public lands are identified as wildland-urban interface areas (WUIs). WUIs presently recognized within the Monticello PA include the communities of Blue Mountain Ranch, Natural Bridges, Bug Point, Cedar Point, Canyon Terrace, Boulder Point, Eastland, Ucolo, Summit Point, Montezuma Canyon, Bluff, Peter's Canyon, Blanding, and Monticello.

Current fire management direction encourages wildland fire use and both fire and non-fire fuel reduction treatments to restore natural fire regimes and to promote the overall ecological health of public lands. The operational role of the Moab Fire District is multi-faceted and comprises wildland fire control and suppression activities, hazardous fuels reduction, wildland fire prevention and education, and collaboration with other agencies in suppression activities as well as in both WUI and non-WUI fuels reduction projects. The Monticello FO Manager authorizes

management response to wildland fires within the Monticello PA, approves decisions for prescribed fire and non-fire fuels reduction treatments, and issues restrictions and closures within the Monticello PA during periods of high fire activity.

### **3.4.2 SPECIFIC MANDATES AND AUTHORITY**

Fire management on BLM lands falls under several broad federal laws and regulations as outlined previously in this document (see Chapter 1), and is also directed by more specific legislation and policy. The following section discusses those mandates and authorities specific to BLM fire management.

- The Federal Wildland Fire Management Policy (BLM 1995), revised as Federal Fire Policy (U.S. Department of the Interior 2001): Provides for firefighter and public safety first, while protecting and improving public lands through fire management activities. Reviewed in 2001, improvements to implementation actions were recognized as necessary to ensure adoption of the Federal Fire Policy (USDI 2001) by all federal agencies. The review concluded that while the 1995 Policy is still appropriate, the role of fire should be emphasized in land management to improve ecosystem health and sustainability. Also, more attention must be given to fire risk in the wildland urban interface, and implementation of the Policy could be improved through better interagency and interdisciplinary coordination.
- The National Fire Plan (USDI 2000): Developed under Presidential direction following the fires of 2000, calls for the continued development and support of firefighting resources, to restore damaged landscapes, and to rebuild communities, with economic assistance as necessary.
- 2000 Cohesive Strategy (Lavery and Williams 2000): Aims to reduce wildland fire risk to communities and to restore and maintain ecosystem health by restoring vegetation to their historic fire regime (i.e., fire frequency and intensity).
- Healthy Forests, An Initiative for Wildfire Prevention and Stronger Communities (signed by the President on August 22, 2002): Designed to improve regulatory processes to ensure more timely decisions and greater efficiency in the effort to reduce catastrophic wildland fire, especially in the wildland-urban interface. As a result of the initiative, in 2003 the Department of the Interior adopted two new categorical exclusions under NEPA: (1) 1.12 for hazardous fuel reduction and (2) 1.13 for post-fire rehabilitation of resources and infrastructure.
- Healthy Forests Restoration Act (Public Law 108–148, December 2003): Crafted to improve statutory processes for hazardous-fuel reduction projects. Provides authorities and direction to help reduce hazardous fuels, especially in the wildland/urban interface, and to restore healthy forest and rangeland conditions. Encourages collaboration with other entities, early public involvement in the planning process, and monitoring of hazardous fuel reduction projects.
- Southeastern Utah Annual Fire Operation Plan (prepared annually): Coordinates cooperation between other BLM districts, U.S. Forest Service (USFS), Bureau of Indian Affairs (BIA), State of Utah, and NPS. Includes procedures for initial attack of a wildfire.

- Instruction Memorandum 2004–007: Land Use Plan and Implementation Plan Guidance for Wildland Fire Management (BLM 2003c), which supersedes BLM Handbook 1601-1 (BLM 2005a) Appendix C, Section J, Fire Management. The interim guidance ensures Federal Wildland Fire Management Policy and 10 Year Comprehensive Strategy guidance are incorporated into land-use plans.
- BLM Manual Handbook H-1742-1 (BLM 1999a) (and supplemental guidance 11/27/2002): Provides direction for emergency stabilization and rehabilitation (ESR).
- BLM Prescribed Fire Manual H-9214 (BLM 2000): Provides direction for planning and implementation of prescribed fire projects and associated prescribed fire plan content.
- Interim Management Policy for Lands Under Wilderness Review H-8550-1 USDI (BLM 1995) Section J, Fire Management: Provides direction for fire management activities in these specially managed areas.
- Final Environmental Impact Statement and Record of Decision (Utah) Vegetation Treatment on BLM Lands in the Thirteen Western States (BLM 1991b): Directs the appropriate use of vegetation management techniques.
- BLM Utah Land Use Plan Amendment for Fire and Fuels Management (2005g): Directs and coordinates BLM fire and fuels management statewide and amends individual field office RMPs.

### **3.4.3 FIRE MANAGEMENT PLAN**

The Moab Fire District Fire Management Plan (FMP) acts as the primary strategic document for fire management in the Monticello PA (Map 3). The FMP integrates RMP direction, goals and objectives for resources influenced by wildland fire, suppression actions, fuels treatment activities, and emergency stabilization and rehabilitation (ES&R). The overlying goal of the FMP is to describe specific actions authorized on the public lands within the Moab Fire District to protect life and ensure public safety, target resource goals and objectives, reduce fuel loads, and to achieve and maintain healthy, functioning ecosystems.

### **3.4.4 DESIRED WILDLAND FIRE CONDITION**

The desired wildland fire condition (DWFC), as described in the Utah Land Use Plan Amendment for Fire and Fuels Management, incorporates both condition class and fire regime in the development of fire management strategies (BLM 2005g). The condition class of a vegetative community is defined in terms of its departure from the historic fire regime; determined by current vegetative composition including alterations and disturbances, and also by the length of fire return intervals within that particular community. Along with one of 3 possible condition classes, 5 combinations of fire frequency intervals or "fire regimes" are considered in assigning attributes to categorize a vegetative community's current condition. The combination of both of these measurements gives a vegetative community a fire regime/condition class rating or "FRCC." As the FRCC is an index of ecosystem at-risk conditions, the DWFC is the description of the desired condition of a vegetative community as it relates to susceptibility from severe fire effects (e.g., the loss of key ecosystem components—soil, vegetation structure, species; or alteration of key ecosystem processes—nutrient cycles, hydrologic regimes). For example, a healthy ecosystem at low risk of losing key ecosystem components following wildland fire

would be considered at optimum DWFC. A lengthy description of fire regime, condition class analyses and historic fire return intervals can be found in Appendix D of the Utah Land Use Plan Amendment for Fire and Fuels Management (BLM 2005g).

### **3.4.5 LANDSCAPE LEVEL MANAGEMENT**

Fire management actions authorized for wildland fire activities, prescribed fire and non-fire fuel treatments, and ES&R are based on the DWFC. The Utah Land Use Plan Amendment for Fire and Fuels Management (BLM 2005g) addresses specific fire management objectives for each major vegetation group, designed to result in progress toward the DWFC of public lands under the jurisdiction of the BLM. Specific actions designed to meet the DWFC are detailed in Table 2.1 of the Utah Land Use Plan Amendment for Fire and Fuels Management and attached to this document as Appendix B. Vegetation groups and fire management objectives are briefly summarized below.<sup>2</sup>

#### **3.4.5.1 SALT DESERT SHRUB**

Salt desert shrub occurs over approximately 85,000 acres in the Monticello PA. The DWFC for this community is native, open salt desert shrub with little invasive species and fire exclusion because of the historical infrequent fire return interval. Management objectives include wildland fire suppression, no wildland fire use, a wide array of fuels treatments, and aggressive seeding in ES&R treatments.

#### **3.4.5.2 PINYON AND JUNIPER WOODLAND**

Pinyon/juniper woodlands cover a large portion of the Monticello PA, with estimates averaging over one million acres on public lands. Objectives differ for those areas where pinyon and juniper did and did not occur historically. The DWFC in historic pinyon/juniper areas is open stands with grass and shrub understory. These areas historically experienced a fire return interval of 15–50 years, which prevented movement of pinyon/juniper into other vegetative communities. The DWFC in non-historic pinyon/juniper areas is the restoration of the vegetative community previous to pinyon/juniper encroachment. Management objectives include minimal suppression where possible to mimic natural fire return interval, wildland fire use where feasible, a wide array of fuel treatments, and aggressive seeding in ES&R treatments.

#### **3.4.5.3 SAGEBRUSH**

Healthy sagebrush stands have declined throughout the Monticello PA, with an estimated 170,000 acres remaining. The DWFC is diverse age class with grass and forbs understory. Management objectives involve a balance between invasive species concerns, wildlife habitat, and restoration of historic fire return interval. Objectives include wildland fire use when appropriate, full-spectrum fuel treatment, and aggressive seeding in ES&R.

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<sup>2</sup> Total acres by vegetation type presented in this section vary from those presented in the Vegetation section because the fire acreages were calculated using GAP and the vegetation acres were calculated using ReGAP.

#### **3.4.5.4 GRASSLAND**

Grasslands occur over approximately 13,000 acres of the Monticello PA. In historic native grassland areas, the DWFC is native grass/forbs community. Dependent upon other resource objectives, the DWFC in non-native grasslands is native grassland or shrub community. Management objectives consider historic fire return interval of 15–50 years and may include wildland fire use, prescribed fire and mechanical and chemical fuel treatments to reduce invasive grasses and encroachment by other trees/shrubs, and aggressive seeding in ESR.

#### **3.4.5.5 BLACKBRUSH**

Blackbrush communities in Utah are thought to have poor regeneration following wildland fire. These communities cover approximately 300,000 acres of the Monticello PA, and management objectives include excluding wildland fire as well as prescribed fire and non-fire fuels treatments.

#### **3.4.5.6 MOUNTAIN SHRUB**

In the Monticello PA, mountain shrub areas cover approximately 6,500 acres. The DWFC in mountain shrub would be differing age classes in mosaic patterns with the exception of WUI areas. When possible, management objectives allow wildland fire to mimic historic fire return intervals. Fuels treatment of all types is encouraged to decrease the potential for high-severity fire.

#### **3.4.5.7 MIXED CONIFER/DOUGLAS FIR/ASPEN**

Mixed conifer/Douglas fir and aspen woodlands cover less than 1,000 acres in specific areas within the Monticello PA. Healthy forests would include a grass/brush understory as well as differing age classes of trees. To achieve this, management objectives include allowing wildland fire where it is possible without high-severity fire and encouraging fuels treatment to retain age diversity, remove ladder fuels, and to reduce fuels where wildland-urban interface values are at risk. Preferred ES&R treatments include tree planting to promote forest regeneration.

#### **3.4.5.8 PONDEROSA PINE**

There are approximately 1,000 acres of ponderosa pine forest in the Monticello PA, most of which is considered condition class 3 in need of treatment. The DWFC of a healthy ponderosa stand would be open stands with grass/forb understory and a diversity of age classes. Management objectives include allowing fire to play a natural role when possible by allowing fire, conducting mechanical fuels treatments, and consideration of seeding in ESR treatments.

#### **3.4.5.9 RIPARIAN WETLAND**

Although this vegetative type covers less than 1% of the total acreage in the Monticello PA, overall it is a vital component. The DWFC of riparian wetland focuses on the reduction of invasives and the retention or restoration of the historic vegetative composition appropriate to the

site. Management objectives allow low-intensity fire in most riparian areas and encourage prescribed fire and mechanical treatment to restore native riparian and wetland species. Active as opposed to passive restoration would be the primary focus of ES&R treatments in riparian wetland areas.

### **3.4.6 FIRE MANAGEMENT PRIORITIES**

Protection of human life, including the lives of firefighters committed to an incident, is the mandated priority for fire management activities. This priority overrides other strategies, actions, and RMP resource goals and objectives. The protection of human communities and infrastructure, other property and improvements, and natural and cultural resources is based on human health and safety, and the costs of protection. Balancing priorities in fire management decisions considers the protection of WUI areas, the maintenance of existing healthy ecosystems, the protection of high priority subbasins or watersheds (HUC 4 or HUC 5), special status species, and/or cultural resources and landscapes.

### **3.4.7 FIRE MANAGEMENT ACTIVITIES TO MEET THE DWFC**

All BLM field offices were given national direction to establish general landscape level goals and objectives for fire management. Landscape level management goals incorporated into the Utah Land Use Plan Amendment for Fire and Fuels Management (BLM 2005g) that apply to the Monticello PA include:

1. Establishing firefighter and public safety as the primary goal in all fire management decisions and actions.
2. Using wildland fire to protect, maintain, and enhance resources and when possible allowing fire to assume a natural ecological role.
3. Reducing hazardous fuels to protect human, natural and cultural resources as well as to restore ecosystems and protect communities.
4. Suppressing fires according to resource objectives and with consideration for firefighter/public safety and other benefits and values to be protected.
5. Providing a consistent, safe, and cost-effective fire management program through appropriate management of planning, staffing, training, and equipment.
6. Establishing fire management units (FMUs) for acreages with burnable vegetation on all BLM-administered lands.
7. Providing emergency stabilization, rehabilitation and restoration to protect and sustain resources, and to safeguard public health and safety as well as community infrastructure.
8. Working with partners and other affected groups to reduce risks to communities and to restore healthy ecosystems.

More specific resource objectives are incorporated in FMPs for individual field offices. To ascertain the most effective methods for achieving DWFC goals in each of the vegetative communities in Utah, fire management activities listed below were discussed and authorized in the decision record for the Utah Land Use Plan Amendment for Fire and Fuels Management (BLM 2005g).

### **3.4.7.1 SUPPRESSION**

A wildland fire requires an appropriate management response or AMR. The AMR can range from full suppression to managing fire for resource benefit (wildland fire use). AMR is guided by the resource strategies, goals and objectives of the RMP with an emphasis on firefighter and public safety, benefits and values to be protected, and suppression costs. FMU objectives as described in the FMP would provide further guidance for an AMR.

### **3.4.7.2 WILDLAND FIRE USE FOR RESOURCE BENEFIT**

Wildland fire use may be an AMR to a naturally ignited wildland fire to accomplish specific resource management objectives in predefined designated areas. Operational management of wildland fire use for resource benefit is detailed in a Wildland Fire Implementation Plan (WFIP). Due to resource condition (FRCC) and proximity to values at risk, wildland fire for resource benefits is not acceptable on all BLM lands within the Monticello PA. As the DWFC of resources move from a higher FRCC to a lower FRCC, wildland fire use for resource benefits in some FMUs may become more practicable. FMUs will be periodically reassessed by fire and fuels staff as well as by resource staff to ascertain changes in vegetation and potential for wildland fire use as a resource tool.

### **3.4.7.3 PRESCRIBED FIRE AND NON-FIRE FUELS TREATMENTS**

Prescribed fire and non-fire treatments are used for hazardous fuels reduction and for community protection from wildland fire. Treatments are also implemented to accomplish resource goals and objectives such as wildlife and range improvements. Treatment projects and acreages are determined through RMP goals and objectives.

Approximately 90% of all non-fire treatment acres are mechanical and/or seedings. Chemical and biological treatments comprise less than 10% of total non-fire treatment acreages. Limitations in applying prescribed fire to meet fuels reduction targets include the condition of vegetation (i.e., aggressive non-native species invasion, or extended periods of drought), air quality restrictions, restrictions on motorized access, budget allocations, personnel capabilities, risk, policy and guidance, and social acceptability.

### **3.4.7.4 EMERGENCY STABILIZATION AND REHABILITATION**

Emergency stabilization and rehabilitation actions following wildland fire may be implemented to protect and sustain resources, and to safeguard public health and safety as well as community infrastructure. All ES&R activities following wildland fire in the Monticello PA would be implemented following the Emergency Fire Rehabilitation Handbook (BLM 1999a) and treatments would be designed according to the Normal Year Fire Stabilization and Rehabilitation Plan (NFRP) for the Moab Fire District, of which the Monticello Planning Area is a part.

### **3.4.7.5 MONITORING**

Monitoring actions would quantify results from fire management decisions and activities. Monitoring conclusions could be used to determine the need for additional or different activities, revisions to the FMP and/or NFRP, or amendments to the RMP.

### **3.4.8 SUMMARY**

National fire management policy has changed and advanced over the past several years in response to increased fatalities, property loss, local economic disruptions and the risk to ecosystems associated with severe wildland fire seasons and increasing WUI conflicts. Because of the imperative to immediately incorporate national and interagency direction into BLM fire management, the Utah BLM amended several BLM land-use plans to include fire management direction and current scientific understanding regarding the nature of fire in the ecosystem. The Utah Land Use Plan Amendment for Fire and Fuels (BLM 2005g) is a lengthy document with an accompanying biological opinion from the U. S. Fish and Wildlife Service (USFS). Although it remains a separate document, fire and fuels management direction contained within the amendment is incorporated by reference in this RMP in its entirety, along with all appendices, tables, and attachments. Also incorporated into this RMP are the resource protection measures (RPMs) identified through the LUP Amendment process that were determined necessary to protect natural or cultural resource values in the implementation of fire management practices.

Fire management direction, activities, and objectives that affect the resources within the Monticello PA are summarized above. Specific goals and objectives for resources within the Monticello PA that are determined in this RMP and that may alter or augment the current decisions for fire and fuels management as dictated by the Utah Land Use Plan Amendment for Fire and Fuels Management (BLM 2005g) will be analyzed in Chapter 4 of this document.

## **3.5 HEALTH AND SAFETY**

### **3.5.1 INTRODUCTION**

A priority in land management for the Monticello FO is ensuring health and human safety on its public lands. The BLM's goals are to effectively manage hazardous materials and safety hazards on the public lands to protect the health and safety of public land users and stewards, protect the natural and environmental resources, minimize future hazardous and related risks, costs and liabilities, and to mitigate physical hazards in compliance with all applicable law, regulation, and policy. These goals stem from the BLM's response to the finding of the National Research Council, Committee to Evaluate the Hazardous Materials Program of the Bureau of Land Management (the Committee). In 1992, the Committee recommended that the BLM "...integrate hazard management activities into BLM's continuing land-use planning and environmental functions." Accordingly, BLM follows its national, state, and local contingency plans as they apply to emergency responses. These plans are also consistent with federal and state laws and regulations.

### 3.5.2 HAZARDOUS MATERIALS

Hazardous materials are generally defined as a usable product or substance that may cause harm to humans, natural resources, or the environment when spilled, released, or physically contacted. Hazardous materials are used in every day activities and may be in the form of a solid, liquid, or gas. Regardless of their physical state, hazardous materials may be toxic, flammable, combustible, reactive, and/or corrosive. When used and stored properly, associated risks are minimized or eliminated.

Physical hazards that pose a threat to the health and safety of humans or animals (e.g., abandoned mine sites, abandon structures, dams, earthquakes, floods, discarded solid waste, etc.) are responsibilities under this program.

Hazardous materials problems within the Monticello PA can result from programs conducted by state and local governments, by local businesses and industries, and/or by illegal dumping of hazardous materials on lands administered by the BLM. There are no approved hazardous material dumps or repositories within the Monticello PA.

#### 3.5.2.1 POTENTIAL HAZARDS

The various producers of hazardous waste pose a potential impact to the health and safety of area residents and visitors, and to the physical environment itself. Both commercial and illegal activities can lead to the creation of hazardous waste sites. Spills, illegal dumping, and the discovery of abandoned hazardous materials are probable within the Monticello PA boundaries. Contaminants from these sites can pose an imminent threat to public safety and negatively impact the environment by impacting soils, ground water flows, air quality, and water quality. The following paragraphs discuss the area's potential hazardous material generators within the Monticello PA.

#### Oil and Gas Drilling Operations

Oil and gas drilling operations are a major user and producer of hazardous materials within the Monticello PA. Potentially hazardous materials or substances typically used in drilling and completion operations are listed in Table 3.9. These substances are contained by the operator and disposed of in a licensed commercial disposal facility. Oil and gas operations are exempt from the Resource Conservation and Recovery Act (RCRA) as oil or gas products become subject to RCRA only after they have been purchased from the oil and gas operator. Oil and gas operations are required to have an emergency response protocol to manage hazardous materials during production and transportation.

**Table 3.9. Typical Hazardous Materials Used in Well Drilling and Completion Operations**

Hazardous Material or Substance	Use
Sodium hydroxide	pH control
Diesel fuel	Engine fuel while drilling
Methanol	Surfactant

**Table 3.9. Typical Hazardous Materials Used in Well Drilling and Completion Operations**

Hazardous Material or Substance	Use
Hydrochloric acid	Acidizing agent
Acetic acid	Acidizing agent
Formaldehyde	Acidizing
Ethylene glycol	Coolant/dehydration
Benzene, hexane	Natural gas condensate
Lead, cobalt, barium, and manganese compounds	Paints (various types)
Zinc and copper compounds	Grease and lubrication oil
Propane	Fuel

Source: BLM 2005j.

Well fires are rare but could occur under favorable conditions, and a well fire could result from a blowout during drilling or workover activities from a gas leak. Conditions that would cause gas accumulation in a confined space, and ignition by a spark would likely produce a well fire. Well fires and explosions during and after drilling operations are a potential health and safety risk, but there have been no reported well fires within the Monticello PA since 1990 (personal communication between Jeff Brown, Monticello FO, and Laura Burch, SWCA on September 5, 2006). Regulations, proposals for operations, Applications for Permits to Drill or Conditions of Approval provide well control measures to minimize blowouts and fires.

### Oil and Natural Gas Pipelines

There are several major natural gas pipelines within the Monticello PA along with numerous secondary pipelines. Operators of the major pipelines include Williams, Anadarko Petroleum, and EnCana Oil and Gas (USA) Inc. Hazardous materials associated with natural gas pipelines include emissions from compressor stations, and benzene and hexane from natural gas condensates. Pipeline accidents have been infrequent in the county, but a possibility of accidents remains due to a number of factors including earthquake, landslide, flood, dam failures, wild fire and man-made causes (San Juan County 2002a). Please see San Juan County's Hazardous Materials Emergency Response Plan (HMERP) for locations of pipelines.

Within the Monticello PA, water, natural gas, and oil pipeline leakages or ruptures have been occurring annually, with an average of 2 to 3 incidences per year. The leakages or ruptures often occur close to the well pads. They are repaired and cleaned up by the operator, and contaminated soil is taken to appropriate treatment facilities on BLM-administered or private lands (personal communication between Jeff Brown, Monticello FO, and Laura Burch, SWCA on September 5, 2006).

Major transportation pipeline design, materials, maintenance, and abandonment procedures are required to meet the standards set forth in U.S. Department of Transportation (DOT) regulations (49 CFR Part 192, Transportation of Natural Gas by Pipelines). Further construction specifications are recommended for safety and are available through the American Society of Mechanical Engineers (ASME-31.8) and the American Petroleum Institute (API Standard 1004).

### Mining Operations

Mining operations are currently a minor user and producer of hazardous materials within the Monticello PA. While the majority of mining operations in the Monticello PA are no longer active, a few operations are currently in production including the Lisbon Valley Copper Mine (under Moab FO jurisdiction) and the White Mesa Uranium Mill. Potentially hazardous materials or substances typically used in mining and processing operations may include those items listed in Table 3.9. As with oil and gas operations, these substances are contained by the operator and disposed of in a licensed commercial disposal facility. Performance standards for mining operations, including environmental standards, are regulated by 43 CFR 3809.420, RCRA and its implementing regulations in 40 CFR 240-282, and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA). Additionally, mine site reclamation must address hazardous materials to comply with state law, UCA-40-8-2(3). Abandoned mine reclamation is discussed later as a specific safety hazard within the Monticello PA.

### Uranium Tailings

The White Mesa Mill, located in Blanding, Utah, currently receives, processes, and disposes of uranium-bearing waste material. The mill has been in operation for over 20 years and is owned by the International Uranium Corporation.

Fry Canyon is an abandoned uranium mill site located in central San Juan County. The site is under the BLM's jurisdiction and has not yet been reclaimed.

### Storage Tanks

The presence and use of aboveground storage tanks (AST) and underground storage tanks (UST) are regulated by the EPA and administered by the State of Utah. It is the responsibility of the operator to understand and comply with the EPA regulations that became effective on December 22, 1998. Within the Monticello PA, storage tanks located on private lands include gasoline and fuel storage facilities, bulk propane and butane facilities and local propane service stations. ASTs on BLM-administered lands include oil, produced water and other chemicals. There are no known USTs on BLM lands within the PA.

### Landfills and Transfer Stations

Landfills are subject to regulation under the RCRA. Permitted landfills include those at Monticello and White Mesa (San Juan County Landfill). Transfer stations are located near Bluff, Mexican Hat, Blanding, Monticello and La Sal. Waste collection services by city and county vary with each community. Where solid waste collection is not provided, residents are required to take their solid waste to a nearby transfer station.

San Juan County owns and manages the county landfill. By law the landfill cannot take in any hazardous waste to be buried in the landfill. Hazardous waste is anything flammable, toxic, reactive, or corrosive, such as pesticides, liquids, batteries, bio-medical wastes, used oil, PCBS, friable-asbestos, or radioactive waste.

### Illegal Dumps

The remoteness of lands within the Monticello PA creates an opportunity for illegal dumping of hazardous materials and solid waste. If responsibility for the illegal dumping can be determined, then the information is reported to the appropriate authorities for prosecution. Protocol for removing illegally dumped hazardous material can be found in San Juan County's HMERP and the Monticello Field Office Contingency Plan.

### Small Businesses

The types of small businesses that generate or use hazardous materials include automotive, printing, and hospitals. These operations are regulated by the EPA and administered by the State of Utah. It is the responsibility of the business owner to understand and comply with EPA regulations.

### Transportation

Transportation accidents could lead to accidental spills and releases within the county. According to the county's HMERP, transportation releases pose the highest threat to the public and emergency responders. Trucks carrying hazardous materials use the county's major highway corridors, SR-191, SR-163 and SR-491 as transportation routes from El Paso, Texas, and Albuquerque, New Mexico, to Salt Lake City, Utah. Additionally, oil and gas development within the county requires the transportation of hazardous materials on many state and county roads.

#### **3.5.2.2 HAZARDOUS MATERIALS MANAGEMENT**

The Monticello FO Hazardous Materials Program is responsible for hazardous materials handling, storage, transport, and emergency response. In October 2002, the Monticello FO approved an HMERP that specified the necessary steps to begin an emergency response. There are also several state and federal mandates, authorities, and handbooks that provide the BLM with management guidelines, objectives and actions pertaining to hazardous materials management. The federal and state prescribed mandates ensure the field office's compliance with applicable laws and regulations.

Management objectives identified within these documents include:

- Protecting public health, safety, and the environment on public lands;
- Identifying and controlling hazards or threats to human health and the environment from hazardous materials releases on public lands;
- Ensuring that activities on public lands comply with applicable federal, state, and local laws, regulations, policies, and procedures;
- Preventing hazardous waste contamination by BLM-authorized actions; and
- Maintaining land health through assessment, cleanup, and reclamation of contaminated sites.

Management actions include:

- Determining, through a pre-acquisition environmental assessment, the nature and extent of potential liability resulting from hazardous substances associated with property during acquisitions and disposals;
- Reporting, securing, and cleaning up public lands within the Monticello PA that are contaminated with hazardous wastes in accordance with federal laws, regulations, and contingency plans;
- Identifying parties responsible for hazardous waste contamination who are liable for cleanup and resource damage costs;
- Identifying appropriate mitigation for surface-disturbing activities associated with hazardous materials and waste management; and
- Following precautions to prevent hazardous waste releases into the environment, and providing adequate warning to potentially affected communities should such releases occur.

### **3.5.3 ABANDONED MINES**

The early mining practices in San Juan County were subject to minimal environmental regulations as was common with most mining districts throughout the West. Federal land management agencies had no requirements for reclamation of abandoned mines on public lands. Mine closures were often inadequate or non-existent. While many abandoned mines are small and their waste is inert, some abandoned mines are a threat to human health and the environment. Physical safety hazards associated with abandoned mines can also be a concern on public lands.

According to the Monticello FO Mineral Potential Report, there are 17 mining districts within the Monticello PA. Within the mining districts, there may be between 1,000 to 1,500 abandoned openings (personal communication between Terry Snyder, BLM, and Laura Burch, SWCA Environmental Consultants, February 2, 2006). Areas with the highest concentration include Cottonwood Wash, Montezuma Canyon, Lisbon Valley, Red Canyon, White Canyon/Fry Canyon, Deer Flat, Elk Ridge, and the southern section of Indian Creek (BLM 2005b).

#### **3.5.3.1 POTENTIAL HAZARDS**

Abandoned mine sites may pose hazards and risks to human health, the environment, and physical safety. Threats to health and the environment consist of: heavy metal contamination, metal contaminated tailings impoundments, stored chemicals, and leaking containers. Changes in the chemical composition or soil loss near abandoned mine land (AML) sites can result in alterations or loss of natural habitat for native wildlife. Abandoned mines may also impact ground water flows and water quality. The impacts to water quality are generally the result of contaminated sediments or metal salts that can affect human health, fisheries, wildlife, and vegetation. Air pollution from contaminated dust can occur on tailings impoundments and waste rock piles near abandoned mill sites. There may also be releases or potential releases of hazardous substances from waste materials and beyond AML sites.

Open mines are unstable; mine adits (horizontal openings or tunnels) may collapse, internal supports may fail, and mine shafts (vertical openings) and winzes (vertical connections between adits) may be obstructed or unseen. Oxygen can be at lethally low concentrations and toxic gases can be at high concentrations or capable of displacing oxygen. Exposure to radiation in the mine atmosphere, particularly radon gas, can be a hazard, especially in abandoned uranium mines. Many abandoned mines in southern Utah are potential sources of radiation.

Water can be a hazard in flooded mines; shallow water can conceal winzes and sharp objects. Hazardous wastes, such as boxes or containers of explosives, and chemicals used in milling or drilling operations could be present. Illegal dumping of hazardous wastes within abandoned mines is also a possibility.

### **3.5.3.2 ABANDONED MINE MANAGEMENT/RECLAMATION ACTIVITIES**

The BLM has recently developed the AML program that addresses the environmental and safety hazards associated with AML sites on public lands. Once the sites are identified they are then prioritized, and appropriate actions are taken on the historic mine sites that pose health and safety risks. The BLM's priority for reclamation of environmentally contaminated sites is based on risk assessments that address threats to human health and the environment. For example, abandoned mine land sites that impact water quality are usually a greater concern and receive a higher priority for reclamation than those that do not impact water quality.

In conformance with the BLM's long-term strategies and national policies regarding AML, this RMP recognizes the need to work with our partners toward identifying and addressing physical safety and environmental hazards at all AML sites on public lands.

### **3.5.4 DEBRIS FLOWS**

There are no known sites in the PA subject to debris flows; therefore this plan will not address this concern.

## **3.6 LANDS AND REALTY**

### **3.6.1 RESOURCE OVERVIEW**

Under the Federal Land Policy and Management Act of 1976 (FLPMA), the BLM has the responsibility to manage the public lands for multiple use and sustained yield and develop management plans. As defined by FLPMA, public lands are those federally owned lands, and any interest in lands (e.g., federally owned mineral estate), that are administered by the Secretary of the Interior, specifically through the BLM. The land surface and mineral ownerships within the Monticello PA are varied and intermingled; consequently, so are the administrative jurisdictions for land use and minerals. The boundaries of the Monticello PA contain approximately 4.5 million acres, of which approximately 1.8 million acres, (39%), are public lands administered by the BLM. Another 54% of lands within the PA boundary are under the ownership of other federal or state agencies. Because of the retention mandates of the other federal agencies and the mandates of state land ownership, BLM-administered lands are

generally considered to be available to help with the county economic base and future community expansion needs. For the most part, the public lands are located in large, contiguous tracts that provide for effective and efficient management (see Map 1).

### **3.6.2 LANDS AND REALTY PROGRAM**

Management of ownership and access to lands within the Monticello PA falls under a variety of categories. These categories depend on whether the BLM is retaining lands, relinquishing control of lands (e.g., sales, exchanges, etc.), granting rights-of-way, permits, or other access, withdrawing lands for certain uses, or otherwise determining the disposition of specific tracts of land. The various categories of lands and realty management within the PA are discussed in the following sections.

The overall goals of the BLM lands and realty program are to:

- Manage the public lands to support goals and objectives of other resource programs;
- Respond to public requests or applications for land-use authorizations; and
- Acquire administrative and public access where necessary to enhance the resource management objectives of the BLM.

#### **3.6.2.1 LAND TENURE ADJUSTMENTS**

As mandated by Section 106(a)(1) of FLPMA (43 United States Code [U.S.C.] 1701), public lands are retained in federal ownership. The exception being those public lands that have future potential for disposal (i.e., sale and exchange), as described under Section 203(a) and Section 206 of FLPMA (43 United States Code [U.S.C.] 1713; 1716). Public lands have potential for disposal when they are isolated and/or difficult to manage. Lands identified for disposal must meet public objectives, such as community expansion and economic development. A balanced approach involving land sales and other disposal methods (land exchange, RPP, etc.) would be used. Other lands can be considered for exchange on a case-by-case basis, if land tenure adjustment (LTA) criteria are met. Disposal actions are usually in response to public request or application that results in a title transfer, wherein the lands leave the public domain. Appendix C, Lands and Realty, lists lands identified for disposal by FLPMA Section 203 sale within the Monticello FO. Two land acquisitions, both from private parties, have taken place in the recent history of the Monticello FO. In 1996, the BLM purchased approximately 560 acres east of Hovenweep National Monument. In 2000, an exchange resulted in the acquisition of 160 acres west of Hovenweep. Both acquisitions were acquired to provide a buffer adjacent to the Monument.

Split-estate situations are generally avoided when acquiring land, if possible. Management of such lands and the resources they contain is difficult, and the special mandates placed on split-estate lands may run contrary to the overall resource program goals and objectives of the BLM. Split-estate lands within the FO are primarily within the McCracken Extension.

### **3.6.2.1.1 SALES**

Public sales are managed under the disposal criteria set forth in Section 203 of FLPMA. Public lands determined suitable for sale are offered on the initiative of the BLM. The lands are to be sold at not less than fair market value. Public lands classified, withdrawn, reserved, or otherwise designated as not available or subject to sale are unavailable.

The Monticello FO has not had an aggressive program to dispose of public lands through exchange. The lands that are currently identified in Appendix C, Lands and Realty, would be considered for disposal by FLPMA Section 203 sale, and other authorities, except in cases where said lands contain species status species or their critical habitat.

### **3.6.2.1.2 EXCHANGES**

Exchanges are initiated in direct response to public requests or by the BLM, to improve management of the public lands. Lands need to be formally determined suitable for exchange, and any exchange must be in the public interest. They are to be in the best interest of the public before an exchange would be considered. In addition, lands considered for acquisition would be those lands that meet specific land management goals identified in the RMP.

### **3.6.2.2 ACCESS**

Access may be closed or restricted, where necessary, to protect public health and safety, and to protect significant resource values.

Throughout much of Utah, the state owns and manages 4 isolated sections in each 36-section township. These are generally sections 2, 16, 32, and 36, and are ordinarily one mile square (640 acres). They are primarily administered by the Utah School and Institutional Trust Lands Administration (SITLA) for the purpose of economic support of the state's public schools and institutional trust funds. Activities on state land generally are not substantially different from those on the surrounding land administered by the BLM. Many of the SITLA lands generate funds through grazing permits, right-of-way easements and permits, and hydrocarbon or other mineral leases.

Many BLM lands with management restrictions, such as WSAs, have state lands that are adjacent to or within their boundaries. State lands that are completely or almost entirely surrounded by BLM lands with management restrictions, or are in conjunction with administratively endorsed NPS lands, are termed state inholdings.

Existing access to inheld state lands varies. Some of the parcels have direct access through cherry-stemmed or boundary roads of WSAs. Inheld parcels may or may not currently have access, depending upon whether or not existing vehicle routes lead to them. BLM policy, as required by the Cotter decision, is that "the state must be allowed access to the state school trust lands so that those lands can be developed in a manner that will provide funds for the common school..." This decision confined the issue of access to situations directly involving economic revenues generated for the school trust. For example, if a holder of a state oil and gas lease on a

parcel of state land that is completely surrounded by a WSA requires access to develop that lease, the BLM must grant the leaseholder reasonable access with consideration given to minimize impacts to wilderness character.

### **3.6.2.3 EASEMENTS**

Public land cannot be effectively administered without legal and physical access. Easements are acquired to provide access to public lands for recreational, wildlife, range, cultural/historical, mineral, ACEC, special management areas, and other resource needs.

Methods used to acquire legal rights that meet resource management needs include negotiated purchase, donation, and exchange. Acquisition alternatives include purchase of fee or less-than-fee interest above, on, and below the surface; and perpetual exclusive, and permanent or temporary nonexclusive, easements. Acquisition of road or trail easements is probably the most frequently encountered access need. Easements can include:

- road easements
- scenic conservation easements
- sign locations
- stream clearance projects
- utility easements
- hunting and fishing easements
- range improvements
- conservation easements

Acquisition of access rights support one or more of these resources: lands, minerals, woodlands, range, wildlife, recreation, and watershed. Most existing easements in the Monticello PA are related to range management (fences, roads, spring developments), though one is a conservation easement related to Gunnison Sage-grouse. Additional easements can be acquired when there is a need; however, no such need had been identified as of the writing of this document.

### **3.6.2.4 LEASES AND PERMITS**

Section 302 of FLPMA authorizes the use, occupancy, or development of public lands, through leases and permits, for uses not authorized under other authorities. Applicants can be state and local governments and private individuals. These uses of public lands include agricultural development, residential use (only under certain conditions), commercial use, advertising, and National Guard use. Leases are long-term authorizations that usually require a significant economic investment in the land.

Permits are usually short-term authorizations not to exceed 3 years. Filming permits are one of the more commonly requested permits. The Monticello FO issued 27 film permits during calendar years 1998–2003. Because of the time sensitive aspect of filming, the BLM is using this RMP process to establish minimum impact criteria for film permitting. These criteria will

simplify both the applications and approval process, resulting in fast and efficient processing of filming permit applications (see Actions Common to All, Chapter 2). Map 4 illustrates common filming locations.

### 3.6.2.5 WITHDRAWALS/CLASSIFICATIONS

Withdrawals are formal Secretarial- or Congressional-level actions that set aside, withhold, or reserve federal land by statute or administrative order for public purposes. A withdrawal may remove areas from the public lands to be managed under the authority of another federal agency or department, but the land does not leave federal ownership. Withdrawals accomplish one or more of the following:

- Transfer total or partial jurisdiction of federal land between federal agencies.
- Close (segregate) federal land to operation of all or some of the public land laws and/or mineral laws.
- Dedicate federal land to a specific purpose.

Withdrawals are often used to preserve sensitive environmental values, protect major federal investments in facilities or other improvements, support national security, and provide for public health and safety. Withdrawals segregate a particular portion of public lands, suspend operation of the public land laws (withdrawn from settlement, sale, location, or entry), and prevent any disposal of public lands or resources involved in certain types of land-use application. Withdrawals remain in effect until reviewed pursuant to Section 204 of FLPMA and continued, modified, or revoked.

Withdrawal review is mandated by FLPMA, which requires the BLM to eliminate all unnecessary withdrawals and classifications. The BLM must ensure withdrawals are supported by showing need, and must revoke withdrawals that lack sufficient justification. Before recommending a withdrawal is continued, the BLM must explore alternatives such as rights-of-way and interagency agreements.

Three withdrawals existed within the Monticello PA as of 2005. Two of the withdrawals were for the Baker Administrative Site of the USFS, and one was to accommodate a road to Natural Bridges National Monument for the NPS (Table 3.10). There are no pending withdrawals.

**Table 3.10. Existing Withdrawals in the Monticello PA**

National Park Service	T. 37 S., R. 18 E.	Road to Natural Bridges
U.S. Forest Service	T. 33 S., R. 23 E.	Baker Administrative Site
U.S. Forest Service	T. 33 S., R. 23 E.	Baker Administrative Site

In addition to the above withdrawals, the 1991 RMP identified several withdrawals that were to be undertaken. These withdrawals were never initiated.

There are several Power Site Reserves/Classifications along the San Juan River corridor administered by the Monticello FO. The lands were opened to the operation of the mining laws in 1958; therefore, their only withdrawal is from disposal actions. Rights-of-way can be granted

on these lands with a Federal Energy Regulatory Commission (FERC) stipulation in the grant. Disposal actions require partial revocation of the withdrawal.

### **3.6.2.6 UTILITY/TRANSPORTATION SYSTEMS**

#### **3.6.2.6.1 RIGHTS-OF-WAY**

A right-of-way (ROW) is an authorization to place facilities over, upon, under, or through public lands for construction, operation, maintenance, or termination of a project. Public lands are made available throughout the Monticello PA for ROWs. With the exception of defined exclusion and avoidance areas, the FO area is subject to ROW designations. ROWs either will not be granted in these exclusion or avoidance areas, or, if granted, will be subject to stringent terms and conditions. The areas are ROW exclusion and avoidance areas in the 1991 RMP:

##### Avoidance Areas

- Alkali Ridge ACEC
- Bridger Jack Mesa ACEC
- Butler Wash ACEC
- Cedar Mesa ACEC, partial
- Hovenweep ACEC
- Indian Creek ACEC
- Lavender Mesa ACEC
- Pearson Canyon hiking area
- Scenic Highway Corridor ACEC
- Shay Canyon ACEC
- Most ROS P class areas

##### Exclusion Areas

- Cedar Mesa ACEC, partial (Grand Gulch special emphasis area)
- Dark Canyon ACEC
- ROS SPM class area in San Juan River SRMA
- Developed recreation sites

ROWs are granted on a case-by-case basis. The majority of ROWs granted between 1998 and 2005 were for non-energy type activities. Only 34% of new ROWs have been for oil and gas gathering systems or roads. In the same period, 35 ROWs were transferred to right-of-way holders. Of these, 17% were not energy related and 83% were energy related. Historically, pipeline ROWs granted within the area have been small surface pipelines, because they were determined to be least environmentally damaging. The larger diameter (10 inches and over) pipelines have been buried. Exclusion areas prohibit ROWs and corridor/window designation.

The trend in oil and gas development during the early 2000s suggests that demand for rights-of-way within the Monticello PA will continue to increase into at least the near future.

### **3.6.2.6.2 RIGHT-OF-WAY CORRIDORS**

ROW corridors were presented as existing groupings of ROWs for electric transmission facilities, pipelines 10 inches and larger, communication lines, federal and state highways, and major county road systems. However, no specific areas were identified by map or legal description. In the 1999 Western Utility Corridor Study (WUG), the US Highway 191, State Highways 491 and 276 corridors, the UP&L 345kV line, and the MAPCO/Williams loop pipelines were identified as preferred ROW corridors through the Monticello PA. The West-wide Energy Corridor Study (WWEC) of 2006 proposes corridors through the Monticello FO.

### **3.6.2.6.3 COMMUNICATION SITE RIGHTS-OF-WAY**

The explosion of wireless networking in the U.S. has fostered an expectation from the public that they will have cell phone coverage virtually anywhere. Within the Monticello PA, there are 10 designated communication sites. This trend is expected to continue with increasing demands placed on the existing 10 sites. Communication sites within the FO are illustrated on Map 4.

### **3.6.2.7 TRESPASS**

The BLM is responsible for realty trespass abatement, which includes prevention, detection, and resolution. Land authorizations, such as leases and permits, have been issued to resolve agriculture and occupancy trespass, where consistent with the LUP. Locations in the FO area where trespass typically occurs are along drainages, oil fields, and areas bordering public lands.

### **3.6.2.8 RECREATION AND PUBLIC PURPOSES ACT (R&PP)**

The R&PP Act was established by Congress as a means for state and local governments as well as non-profit organizations to acquire public lands at no cost or a reduced cost. Many western governmental entities have taken advantage of this Act to provide the public with much needed local services and locations for recreational activities.

To date, 11 R&PP authorizations had been made within the Monticello PA (Table 3.11).

**Table 3.11. R&PP Authorizations for the Monticello PA**

<b>R&amp;PP Leases/Grants</b>	<b>Authorization Type</b>	<b>Purpose</b>	<b>Acres</b>
American Legion	Patent	Rodeo grounds	40.00
San Juan Foundation/Blanding	Patent	Hiking trail	160.00
LDS. Church	Patent	Church building	2.00
San Juan County	Patent	Road shed	5.97
Utah Division of State Parks	Patent	State park	10.00
San Juan County	Patent	Landfill	390.00

**Table 3.11. R&PP Authorizations for the Monticello PA**

R&PP Leases/Grants	Authorization Type	Purpose	Acres
City of Blanding	Patent	Reservoir	100.00
City of Blanding	Patent	Water pipeline and recreation site	158.00
College of Eastern Utah	Patent	Campus	40.00
San Juan Foundation	Patent	Campus	120.00
San Juan Water Conservancy District *	Classification	Recreation site	20.00

\* R&PP application withdrawn. Classification still in place.

An additional 470 acres adjacent to Recapture Reservoir has been classified as suitable for R&PP lease or patent. The cities of Monticello and Mexican Hat have expressed interest in obtaining ownership of the parcels on which they have a right-of-way for city water treatment plants and the Mexican Hat sewer treatment facility. Although not currently classified for R&PP, these parcels are suitable for such classification as a means of transferring ownership to the cities.

### 3.6.2.9 PROTECTION ZONES

Protection Zones are small areas within which critical resources, such as potable water sources, exist and must be protected for health and human safety reasons. Within the Monticello PA, only one such protection zone has been established. This water source protection zone has been established around the water well supplying the Sand Island campground and boat launch facility. It is displayed on the appropriate master title plat.

### 3.6.2.10 ALTERNATIVE ENERGY SOURCES

A national trend is to use public lands to develop renewable energy sources such as wind power, solar power, and hydropower. National organizations are looking at public land to help provide non-polluting power sources for a growing population. In the future, BLM-administered lands could play an increasing role in providing clean energy sources.

The U.S. Department of Energy publication "Assessing the Potential for Renewable Energy on Public Lands" prepared by the U.S. Department of Energy (DOE 2003) assessed the potential for the following renewable energy sources on public lands in the 11 western states: solar, biomass, geothermal, water, and wind. More recently, the *Programmatic EIS on Wind Energy Development on BLM-administered Lands in the Western United States* (BLM 2005f) provided specific data on wind energy development potential on public lands. The data show that the Monticello PA has been identified as possessing a low potential for all of the resources studied.

### 3.7 LIVESTOCK GRAZING

#### 3.7.1 INTRODUCTION

Livestock grazing allotments occur on approximately 93% of all BLM lands located within the Monticello PA boundary. Within Monticello Field Office (Monticello FO) there are 1,633,253 BLM acres (93%) available for grazing and 128,098 BLM acres (7%) unavailable for livestock grazing for resource protection, which includes an estimated 15,720 acres outside of grazing allotments reserved for wildlife use along the slopes of East and Peters Canyons. Also, an administrative horse pasture encompasses 288 BLM acres.

Of the lands within grazing allotments, 1,761,351 acres (78%) are BLM lands; 190,366 acres (8%) are SITLA lands; 53,704 acres (2%) are private; 261,574 acres (12%) are NPS lands; and 2,701 acres (>1%) are water. The acres within each entity are shown on Figure 3.8.

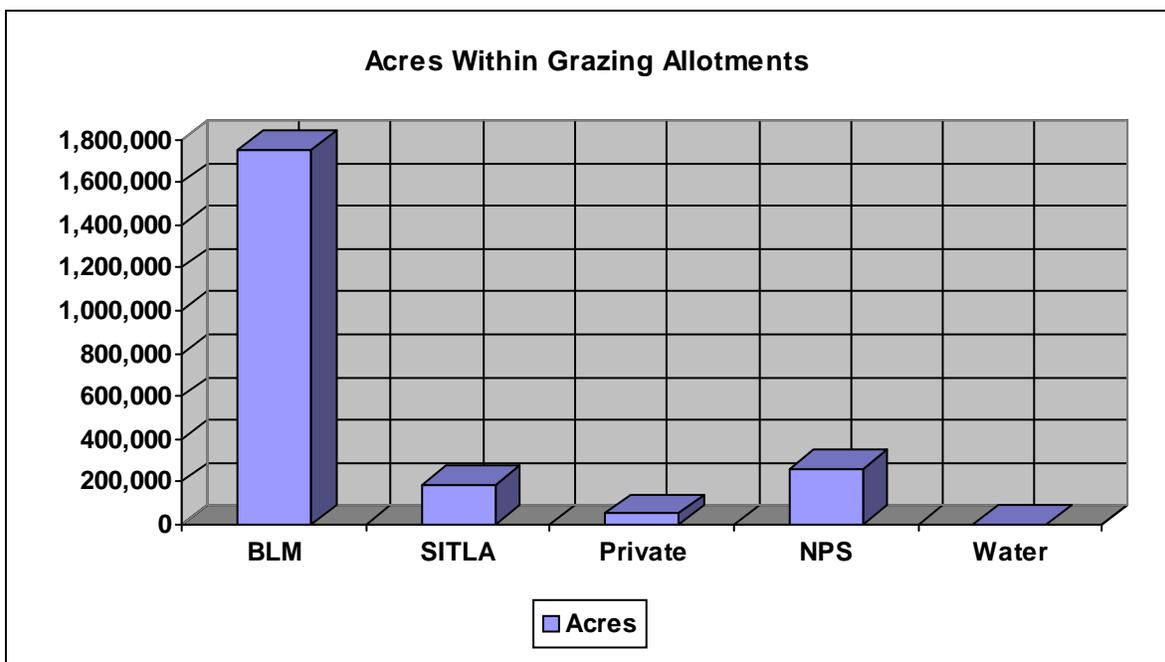


Figure 3.8. Acres within grazing allotments.

#### 3.7.2 RESOURCE OVERVIEW

The following sections provide a summary of the number of permitted allotments, amount of riparian area, allotment management categories, ecological status and current management practices for the allotments. Allotment-specific information can be found in Appendix D, Livestock Grazing.

##### 3.7.2.1 ALLOTMENT STATUS

A total of 75 allotments exist within the boundaries of the Monticello PA. However, one of these allotments (Rogers) is currently not permitted for use by domestic livestock. The Squaw Canyon

allotment, some of which is within the boundaries of the Monticello PA, is administered by the Durango FO.

In addition, the Monticello FO administers one entire allotment (Monucolo) and a part of another allotment (Bug-Squaw) located outside the Monticello PA boundary. The Monucolo allotment and the Colorado portion of the Bug-Squaw allotment are managed in accordance with direction given in the San Juan and San Miguel RMP (Durango FO).

### 3.7.2.2 RIPARIAN AREAS

Riparian areas, consisting of 28,994 acres (based on 1990's inventory data, subject to reevaluation), occur within 49 of the allotments. The amount of riparian area occurring within these allotments ranges from 0.1% to 10.3%. Riparian areas comprise 1.3% of the total allotment acreage. Further information regarding riparian areas may be found in Section 3.12, Riparian Resources.

### 3.7.2.3 ALLOTMENT MANAGEMENT CATEGORY

Each permitted allotment has been evaluated and designated into one of 3 categories: maintain (M), improve (I), or custodial (C). Allotments in the M Category are in generally good condition and have no serious resource conflicts under present management. These may have some potential for a positive return on investments. I Category allotments may have serious resource conflicts, or their resource production is below its potential under present management. These allotments have potential to improve or have conflicts that can be resolved through changes in grazing management or investments in range improvement projects. Allotments in the C Category have low productivity potential, limited resource conflicts, and no opportunity for a positive return on public investments. A more detailed list of criteria used for categorizing each allotment may be found under Section D.3, Criteria Used to Determine Allotment Management Category, of Appendix D.

### 3.7.2.4 LIVESTOCK GRAZING ALLOTMENTS

The number of allotments in each category are shown in Table 3.12 below.

**Table 3.12. Allotments in the Monticello PA by Management Category**

<b>M Category (Maintain)</b>	<b>I Category (Improve)</b>	<b>C Category (Custodial)</b>
9 Allotments (12%)	29 Allotments (39%)	36 Allotments (49%)

### 3.7.2.5 ECOLOGICAL STATUS

The ecological status of each allotment was estimated in the 1980s. Four classes are used to express the proportion of which the present kinds, proportions, and amounts of plants in a biotic community reflect the potential natural community (PNC). These classes are as follows:

Potential Natural Community (PNC):	76–100% similar
Late Seral:	51–75% similar
Mid Seral:	26–50% similar
Early Seral:	0– 25% similar

The percentage of acres within the allotments in each seral stage class are shown in Table 3.13.

**Table 3.13. Percent of Acres within the Monticello FO Boundaries by Ecological Class**

PNC	Late Seral	Mid Seral	Early Seral	Other (Rock Outcrop/Badlands/Seedings)
3.6%	13.0%	53.4%	17.1%	12.8%

### 3.7.3 CURRENT MANAGEMENT PRACTICES

Of the 74 allotments currently permitted within the Monticello PA boundaries, cattle graze 61 allotments and cattle and horses graze 13 allotments. A total of 78,796 animal unit months (AUMs) are currently authorized (active). Of these, 77,365 AUMs (98%) are used by cattle and 1,431 (2%) are used by horses. An additional 7,299 AUMs are allowed through exchange of use (other ownership). The term "AUM" is a measure of forage quantity and refers to the amount of forage necessary for the sustenance of one cow (including her calf under 6 months of age) or its equivalent for a period of one month. It is used to denote an increase or decrease in the amount of forage available for livestock grazing and not necessarily a change in grazing preference. "Grazing preference" or "preference" refers to the total number of AUMs on public lands that are attached to base property owned or controlled by the grazing allotment permittee, and includes both active AUMs (AUMs available for livestock grazing on a permittee's permit) and AUMs held in suspension (AUMs not available for livestock use until the BLM, through decision, would activate them).

The grazing management systems currently in use on the permitted allotments are as follows:

- Season-long—35
- Deferred—11
- Deferred rotation—28

The lengths of season under season-long grazing systems vary from one to 12 months. The majority of grazing systems include both "dormant season" and "growing season" use. However, 12 allotments are grazed only during the growing season and nine allotments only during the dormant season.

Two of the permitted allotments (Tank Draw and East Canyon) have allotment management plans (AMPs) that prescribe a sequence of grazing among pastures in accordance with the terms and conditions of the grazing permits. The remaining 71 allotments are managed in accordance with the terms and conditions of each grazing permit. AMPs for many of these allotments may be developed in the future.

Appendix D includes various documents related to livestock grazing, including:

- Allotment Situation Summary
- Fundamentals of Rangeland Health
- Utah Standards and Guidelines
- Allotment Management Category Criteria
- Allotment Situation Tables

### **3.7.4 RESOURCE DEMAND AND ANALYSIS FORECAST**

The resource demand is considered to be the amount of grazing by both domestic livestock and wildlife. However, the resource demand discussed here will be limited to grazing by domestic livestock, which is considered to be the total of current authorized (active) use (78,796 AUMs) and suspended use (17,173 AUMs). This amounts to a total resource demand by domestic livestock of 95,969 AUMs.

The changes in total authorized (active) use since the 1985 Management Situation Analysis are due to 1) changes in land ownership, or as a result of rangeland monitoring that indicated the need for adjustment, and 2) the grazing allotment closure in Comb Wash. In 1993, a portion of the Comb Wash allotment (comprised of approximately 16,599 acres of federal land in Mule Canyon south of U-95, and Arch, Fish, Owl, and Road canyons) was made unavailable to grazing by court decision (see IBLA 92-264). Trends in authorized use prior to that time are not known.

### 3.8 MINERALS

The Monticello PA is known to have significant occurrences of mineral resources, as noted in a variety of studies. Recently, a multi-agency effort produced a "Scientific Inventory of Onshore Federal Lands' Oil and Gas Resources and Reserves and the Extent and Nature of Restrictions or Impediments to their Development" (U.S. Departments of the Interior, Agriculture, and Energy 2003). This report is based on the USGS estimation of undiscovered, technically recoverable resources, Energy Information Administration (EIA) reserve calculations, and an estimate of restrictions or impediments to the development of those resources and reserves. It is BLM policy to consider this information in its planning process. Although the main purpose of the report is to classify the availability of land for leasing and leasing stipulations, resources are also evaluated. The calculation of resources is primarily mathematical and the estimates are provided on a multiple-state, basin-wide scale and are of limited use on the local, PA scale.

The BLM compiled more site-specific data based on oil and gas play areas, past exploration, and other records it has for the Monticello PA. Numerous data sources, including USGS, UGS, academic research, UDOGM, industry and government sources, were used to compile the Mineral Potential Report for the Monticello Planning Area (BLM 2005b). It characterizes the mineral resources of the Monticello PA; summarizes past and present development activities; and classifies the potential and certainty for mineral occurrence and the potential for future development of each mineral resource. Mineral potential is classified using the rating system outlined in BLM Manual 3031 (USDI 1985; Table 3.14). Under this system:

- **Occurrence potential** is based strictly on the geologic likelihood of the mineral to be present in an area. It does not address the economic feasibility of developing the resource.
- **Development potential** for a resource is based on review of available literature on the mineral's market factors; communication with industry experts and government officials familiar with the specific resource and area; and other considerations such as occurrence potential, historical development, commodity price, and supply and demand. The potential for development of each mineral resource is projected for 15 years, and is rated as high, moderate, or low (Maps 14–17).

**Table 3.14. Ratings for Mineral Occurrence Potential and Certainty**

Rating	Description
<b>Level of Potential Ratings</b>	
O	The geologic environment, the inferred geologic processes, and the lack of mineral occurrences do not indicate potential for the accumulation of mineral resources.
L	The geologic environment and the inferred geologic processes indicate low potential of accumulation of mineral resources.
M	The geologic environment, the inferred geologic processes, and the reported mineral occurrences or valid geochemical/geophysical anomaly, and the known mines or deposits indicate moderate potential for accumulation of mineral resources.

**Table 3.14. Ratings for Mineral Occurrence Potential and Certainty**

Rating	Description
H	The geologic environment, the inferred geologic processes, and the reported mineral occurrences or valid geochemical/geophysical anomaly, and the known mines or deposits indicate high potential for accumulation of mineral resources. The known mines and deposits do not have to be within the area that is being classified, but have to be within the same type of geologic environment.
ND	Mineral potential not determined due to lack of useful data.
<b>Level of Certainty Ratings</b>	
A	The available data are insufficient and/or cannot be considered as direct or indirect evidence to support or refute the possible existence of mineral resources within the respective area.
B	The available data provide indirect evidence to support or refute the possible existence of mineral resources.
C	The available data provide direct evidence but are quantitatively minimal to support or refute the possible existence of mineral resources.
D	The available data provide abundant direct and indirect evidence to support or refute the possible existence of mineral resources.

### **3.8.1 LIMITED MINERAL RESOURCES NOT DISCUSSED FURTHER**

Geologic host formations exist in the Monticello PA for mineral resources *other* than those described and analyzed in detail in this EIS, but their known occurrence is limited or insignificant. There is minimal or no interest in the development of several minor resources present on public lands within the Monticello PA, including coalbed methane, geothermal water, lode gold, manganese, humate, gypsum, barite, zeolite, shale, fire clay, crushed stone, and collectable rocks. These resources are describe briefly here but will not be discussed further in this EIS.

- **Coalbed methane** development potential is very low or nonexistent. The coal in the Dakota Sandstone is generally thin and discontinuous and not usually thick enough to be an attractive reservoir. Shallow and dissected deposits of coal are likely to have lost any contained gas to the atmosphere. The coal is also of low rank, generally subbituminous C, and as such will not have generated any thermogenic gas. The coal is commonly impure or boney, with thinly interlaminated shale, and nearly everywhere contains higher ash content (more than 30%), that reduces the gas carrying capacity of the coal.
- Low-temperature **geothermal waters** (20–36 °C [68–97°F]) have been recorded from several springs and wells in the Monticello PA, including the Warm Springs Canyon geothermal area identified by the USGS. However, because of where the Monticello PA is situated within the Colorado Plateau geologic province, no high-temperature geothermal resources are expected within reasonable drilling depths (Gloyn et al. 1995). There is potential for direct use of low-temperature geothermal water for space heating of buildings, but no such development on public lands within the Monticello PA exists or is expected.
- Minor, non-commercial deposits of **lode gold** occur in the Tertiary intrusives of the Abajo Mountains (Witkind 1964; Gloyn et al. 1995).

- A small number of **manganese** deposits are found in Jurassic and Cretaceous sedimentary rocks along the Lisbon Valley fault system, which is mostly north of the Monticello PA (Baker et al. 1952; Weir and Puffet 1981; Gloyn et al. 1995). No recent exploration activity for manganese in these formations in the Monticello PA is known, and the potential for discovery of any economic deposits is minimal (BLM 2005b, 2005c).
- Weathered coal and carbonaceous shales and mudstones of the Cretaceous Dakota Sandstone have potential for sale as **humate**, a natural soil conditioner (Gloyn et al. 1995). However, no known humate exploration has taken place on public lands within the Monticello PA, and development potential is considered very low.
- **Gypsum** can be found throughout the Monticello PA in the Pennsylvanian Paradox Formation, the Permian Cedar Mesa Sandstone, and the Triassic Moenkopi Formation (Gloyn et al. 1995). However, gypsum is a very low unit value commodity and generally must be located close to existing wallboard plants to be economical. Therefore, development potential of gypsum in the Monticello PA is very low.
- A small amount of **barite** was reported associated with uranium-vanadium-copper mineralization at a mine in the west-central part of the Monticello PA (Trites and Chew 1955). However, these occurrences are insignificant compared to Nevada's large-bedded barite deposits and, thus, are not likely to be developed.
- Minor **zeolite** deposits are known to be contained in the Brushy Basin Member of the Morrison Formation, and hypothetically, potential exists for zeolite production in the Monticello PA (Gloyn et al. 1995). However, high-purity zeolites have not yet been found, and the zeolite industry continues to be very small.
- Common **fire clay** and fire clay of "fair to good quality" is known to occur in the Triassic Moenkopi Formation, the Petrified Forest Members of the Triassic Chinle Formation, the Brushy Basin and Westwater Canyon Members of the Jurassic Morrison Formation, and the Cretaceous Mancos Shale (Gloyn et al. 1995; BLM 2005c). No information is available regarding past and present exploration, development, or production within the Monticello PA (BLM 2005b, 2004b).
- **Stone suitable for crushing** in the Monticello PA includes limestones in the Pennsylvanian Hermosa Group Honaker Trail Formation and the Jurassic Navajo Sandstone (Ritzma and Doelling 1969), as well as some sandstones and conglomerates of the Cretaceous Dakota Sandstone and Burro Canyon Formation. Although LR 2000 records indicate there has been only one authorization since 1989 (BLM 2005b), this resource could become more significant as presently suitable sand and gravel resources are exhausted. In any event, the need for crushed stone in the foreseeable future is anticipated to be insignificant.
- **Collectable rocks** and semiprecious gemstones present in the Monticello PA include petrified wood containing opal and agate, chalcedony, garnet, azurite, and malachite. Petrified wood is found scattered throughout the Monticello PA, hosted in the Jurassic Morrison and Triassic Chinle Formations. Deep red to black pyrope garnets have been recovered from volcanic vent deposits of the Mule Ear and Moses Rock occurrences near Mexican Hat. The amount of garnet material known to be present in this area is so small that commercial extraction is unlikely (Gloyn et al. 1995). None of the above-mentioned collectable materials have been or are expected to be produced on public lands in large quantities.

### **3.8.2 LEASABLE MINERALS**

Leasable minerals are subject to disposal by lease under the authority of the Mineral Leasing Act of 1920, as amended. A classification for leasable minerals such as a Designated Tar Sand Area (DTSA) or a Known Potash Leasing Area (KPLA) is an area where a potentially valuable deposit has been identified and where competitive leasing is required. Existing leases are shown on Map 18.

#### **3.8.2.1 OIL AND GAS**

The exploration and development of leasable minerals is accomplished in several stages of activity. The first stage (land categorization) involves determining which public domain lands should be leased and under what conditions. This is accomplished through the land-use planning process. The second stage is leasing. The third stage includes exploration, development, and production operations.

The BLM has designated 4 allocations that describe the conditions placed upon public domain lands in regard to their availability for fluid hydrocarbon leasing. Under the existing plan, the BLM has assigned one of four following oil and gas leasing stipulations to the public lands:

- **Standard Stipulations**—Areas identified with standard stipulations are open to exploration and development, subject to standard lease terms and conditions.
- **Special Conditions**—Areas identified with these stipulations are open to exploration and development, subject to relatively minor constraints such as seasonal restrictions.
- **No Surface Occupancy**—Areas identified as NSO are open to exploration and development subject to highly restrictive lease stipulations, including no surface occupancy.
- **Closed to Leasing**—Areas identified as closed to leasing either by discretionary or non-discretionary decisions. Discretionary closures involve lands where the BLM has determined that mineral leasing would not be in the public interest. Non-discretionary closures involve lands that are specifically closed to mineral leasing by law, regulation, Secretarial Decision, or Executive Order.

##### **3.8.2.1.1 RESOURCE OVERVIEW**

The primary formations from which oil and gas are currently being produced are the Ismay and Desert Creek zones of the Paradox Formation, the Devonian McCracken Sandstone Member of the Elbert Formation, the Mississippian Leadville Limestone, and the Pennsylvanian Honaker Trail Formation.

As described in the 1995 National Assessment of the U.S. Oil and Gas Resources—Results, Methodology, and Supporting Data (Gautier et al. 1996), the USGS has delineated a number of oil and gas plays, both structural and structural-stratigraphic, in the Paradox Basin Province. Approximately 70 oil and gas fields are located in these plays in the Monticello PA (Table 3.15). These 78 fields encompass approximately 1,135 active wells (including producing oil and gas wells, shut-in oil and gas wells, temporarily abandoned oil and gas wells, and water injection, disposal, and source wells; Table 3.16) and, as of December 2003, have cumulatively produced

more than 535 million barrels of oil and 1.26 billion million cubic feet (MCF) of gas (UDOGM 2004; see Table 3.15). Approximately 5–21 oil or gas wells have been drilled per year in the PA, with an average of 13 wells drilled per year on all lands in the PA. Oil and gas plays that occur in the Monticello PA are as follows:

- The **Buried Fault Black play** is located in the northern part of the Monticello PA, in the Paradox Fold and Fault Belt. This play contains the McCracken Sandstone Member of the Elbert Formation and the Leadville Limestone. The largest of the 6 oil and gas accumulations in this play is the Lisbon field, which contains approximately 43 million barrels of oil and 250 billion cubic feet of natural gas.
- The **Porous Carbonate Buildup play** contains most of the oil and gas fields in the Monticello PA (Huffman 1996a, 1996b). The fields in this play occur primarily in the Blanding subbasin and produce oil and gas from mounds of algal limestone and dolomitic reservoirs in the Pennsylvanian Hermosa Group. This play contains the largest oil field in Utah: the Greater Aneth field.
- The **Fractured Interbed play** is an unconventional continuous-type play that depends on extensive fracturing in the clastic or carbonate interbeds between evaporates of the Paradox Formation. These same interbeds provide the source rocks for most of the oil and gas in the Paradox Basin (Huffman 1996a, 1996b). These include Kane Creek, Chimney Rock, Gothic, and Hovenweep Shales.
- The post-Mississippian **Salt Anticline Flank play** is also located in the northern portion of the Monticello PA. It occurs along the flanks of the northwest-trending salt anticlines in the area (Huffman 1996a, 1996b). Only a few oil and gas fields have accessed the Hermosa Group and Cutler Group reservoirs of this play.
- The **Permo-Triassic Unconformity play** extends west from the tar sand deposits of south-central Utah (Huffman 1996a, 1996b). Reservoirs for oil are in the Permian White Rim Sandstone and the White Rim and DeChelly Sandstones of the Paradox Basin. Reservoir thicknesses can vary from a few feet to several hundred feet. This play is only lightly explored and contains no developed oil and gas fields in the Monticello PA.
- Although not delineated as a Paradox Basin play, the USGS has also defined a hypothetical play in the southwest corner of the PA called the **Late Proterozoic** (Chuar-sourced) and **Lower Paleozoic play** (Huffman 1996a, 1996b; Butler 1996). Very few wells have penetrated the Chuar Group in Utah (Butler 1996).

**Table 3.15. Monticello Planning Area Oil and Gas Field Statistics as of December 31, 2003 (Includes All Lands within the Area)**

Field Name	UDOGM Field Number	Field Type	Producing Formation	Status	Year Disc.	Active Wells	Cumulative Oil Production (barrels)	Cumulative Natural Gas Production (MCF)	Cumulative Water Production
Akah	275	Oil	Ismay	Active	1958	2	526,222	494,661	2,033,332
Alkali Canyon	280	Gas	Desert Creek	Abandoned	1965	0	3,919	40,085	1,297
Alkali Point	481	Gas	Ismay	Inactive	1987	2	342	163,765	17
Anido Creek	285	Oil	Ismay	Abandoned	1958	0	612,082	424,388	718,051
Bannock	287	Oil	Ismay	Active	1989	1	216,855	755,978	30,279
Black Bull	297	Oil	Desert Creek	Active	1992	1	50,584	247,352	694
Bluff	295	Oil	Desert Creek	Active	1956	8	1,668,207	3,693,619	126,624
Bluff Bench	300	Oil	Ismay–Desert Creek	Abandoned	1957	0	14,531	4,593	13,762
Boundary Butte	305	Oil	Ismay–Desert Creek	Active	1947	25	5,448,763	13,218,702	23,205,666
Branford Canyon	310	Oil	Ismay	Active	1983	2	50,204	363,923	54,199
Broken Hills	315	Oil	Ismay–Desert Creek	Active	1959	1	143,692	86,193	209,360
Bronco	312	Gas	Desert Creek	Active	1992	1	4,471	109,386	138
Bug	320	Oil	Desert Creek	Active	1980	7	1,622,455	4,483,368	3,181,467
Caballo	736	Gas	Ismay	Active	1987	1	11,042	427,759	2,312
Cactus Park	484	Gas	Honaker Trail	Inactive	1987	1	0	3,500	354
Cajon Lake	730	Oil	Ismay–Desert Creek	Inactive	1988	1	40,197	166,571	10,778
Cajon Mesa	326	Oil	Desert Creek	Active	1992	1	126,073	663,259	14,997
Casa Mesa	489	Oil	Ismay	Abandoned	1986	0	3,370	5,252	13,573
Cave Canyon	323	Oil	Ismay	Active	1984	10	2,389,346	3,875,293	3,763,167
Cherokee	324	Gas	Ismay	Active	1987	3	182,464	3,667,068	3,358

**Table 3.15. Monticello Planning Area Oil and Gas Field Statistics as of December 31, 2003 (Includes All Lands within the Area)**

Field Name	UDOGM Field Number	Field Type	Producing Formation	Status	Year Disc.	Active Wells	Cumulative Oil Production (barrels)	Cumulative Natural Gas Production (MCF)	Cumulative Water Production
Chinle Wash	325	Gas	Ismay–Desert Creek	Abandoned	1957	0	5,611	2,737,772	87,575
Clay Hill	327	Oil	Desert Creek	Active	1978	3	985,080	1,389,250	216,241
Cleft	330	Oil	Akah	Abandoned	1963	0	3,537	1,031	5,821
Cone Rock	335	Oil	Akah	Abandoned	1959	0	133	0	2
Cowboy	340	Oil	Ismay	Active	1968	2	217,367	41,045	16,229
Dead Man Canyon	345	Gas	Ismay	Active	1983	3	21,380	1,093,684	5,460
Deadman-Ismay	346	Gas	Ismay	Active	1987	3	785,000	12,190,488	152,708
Desert Creek	350	Oil	Desert Creek	Active	1956	8	2,030,862	1,715,012	313,736
Gothic Mesa	355	Oil	Ismay–Desert Creek	Active	1956	8	1,941,156	1,277,313	362,046
Grayson	360	Oil	Ismay	Abandoned	1957	0	5,777	4,876	2,220
Greater Aneth	365	Oil	Ismay–Desert Creek	Active	1956	482	432,914,670	378,829,790	1,348,164,582
Hatch	370	Oil	Desert Creek	Abandoned	1958	0	15,148	40,891	0
Hatch Point	367	Oil	Ismay	Inactive	1993	1	4,607	10,731	259
Heron	447	Oil	Ismay	Inactive	1991	1	237,321	402,860	36,957
Hogan	375	Oil	Ismay	Abandoned	1961	0	756	775	98
Horse Canyon	448	Oil	Desert Creek	Active	1998	1	149,247	174,075	8,707
Ismay	380	Oil	Ismay	Active	1956	10	10,863,672	17,504,794	11,229,950
Kachina	379	Oil	Ismay	Active	1987	5	2,547,419	2,236,280	13,466,362
Kane Creek	377	—	Paradox	Abandoned	1925	0	—	—	—
Kiva	381	Oil	Ismay	Active	1984	5	2,610,110	3,739,168	14,376,896
Lightning Draw	742	Oil	Ismay	Abandoned	1988	0	2,039	9,178	1,674
Lightning Draw SE	743	Oil	Ismay	Inactive	1980	2	0	0	0

**Table 3.15. Monticello Planning Area Oil and Gas Field Statistics as of December 31, 2003 (Includes All Lands within the Area)**

Field Name	UDOGM Field Number	Field Type	Producing Formation	Status	Year Disc.	Active Wells	Cumulative Oil Production (barrels)	Cumulative Natural Gas Production (MCF)	Cumulative Water Production
Lime Ridge	—	—	Ismay–Desert Creek–Akah	—	—	1	—	1,500,000 (CO <sub>2</sub> )	—
Lisbon*	385	Gas	McCracken/Leadville	Active	1961	23	51,076,593	761,560,184	49,512,009
McCracken Spring	402	Oil	Ismay	Active	1987	3	403,288	1,947,709	13,031
McElmo Mesa	405	Oil	Ismay	Inactive	1965	0	2,219,175	2,927,239	6,122,732
Mexican Hat	410	Oil	Honaker Trail	Active	1908	81	278,007	1,547	692
Monument	403	Oil	Desert Creek	Active	1991	2	117,009	565,834	11,692
Mustang Flat	415	Gas	Ismay	Active	1982	8	773,299	16,349,062	19,344
Navajo Canyon	488	Oil	Ismay	Active	1977	1	39,049	25,441	6,189
Patterson Canyon	420	Oil	Ismay	Active	1974	9	1,070,208	2,595,522	1,563,740
Paiute Knoll	425	NA	Ismay	Inactive	1972	1	0	0	0
Rabbit Ears	430	Oil	Ismay	Abandoned	1967	0	54,068	154,717	641,817
Recapture Creek	435	Oil	Ismay–Desert Creek	Active	1925	5	2,206,281	3,716,864	358,308
Recapture Pocket	437	Oil	Desert Creek	Active	1987	3	176,538	324,275	40,467
River Bank	440	Oil	Ismay	Abandoned	1967	0	1,396	8,774	376
Road Canyon	401	Oil	Desert Creek	Active	1988	1	23,363	41,971	8,126
Rockwell Flat	445	Oil	Ismay	Abandoned	1967	0	624,235	518,812	4,191,806
Runway	446	Oil	Desert Creek	Active	1990	3	852,406	2,950,738	31,511
Shumway Point	486	Gas	Ismay	Active	1987	1	239	69,353	14
Soda Spring	741	Oil	Desert Creek	Abandoned	1989	0	3,657	9,303	5,453
Squaw Canyon	460	Oil	Ismay–Desert Creek	Active	1980	2	342,977	888,253	21,468
Tin Cup Mesa	465	Oil	Ismay	Active	1982	10	2,461,650	3,634,276	8,679,678

**Table 3.15. Monticello Planning Area Oil and Gas Field Statistics as of December 31, 2003 (Includes All Lands within the Area)**

Field Name	UDOGM Field Number	Field Type	Producing Formation	Status	Year Disc.	Active Wells	Cumulative Oil Production (barrels)	Cumulative Natural Gas Production (MCF)	Cumulative Water Production
Tohonadla	470	Oil	Ismay–Desert Creek	Active	1956	4	2,258,444	921,663	915,653
Tower	476	Oil	Desert Creek	Abandoned	1994	0	10,064	3,848	20,447
Turner Bluff	475	Oil	Ismay–Desert Creek	Active	1957	9	920,213	754,089	560,058
Ucolo	477	Gas	Honaker Trail	Abandoned	1981	0	78,621	1,081,490	4,169
Wild Stallion	478	Gas	Ismay–Desert Creek	Active	1989	1	1,479	376,692	107
Wildcat	1	Oil	—	—	—	—	351,521	6,275,905	—
Yellow Rock	485	Oil	Ismay	Abandoned	1964	0	18,205	11,258	194,509
<b>Totals</b>						<b>769</b>	<b>534,817,696</b>	<b>1,264,008,547</b>	<b>1,494,754,344</b>

\*Partially located in the Moab Planning Area to the north

Source: Utah Division of Oil, Gas and Mining (UDOGM) 2004.

— no data.

**Table 3.16. Summary of Status of All Wells Located within the Monticello PA, as of March 24, 2005**

<b>Well Status</b>	<b>Number of Wells</b>
<b>ACTIVE WELLS</b>	
Producing oil wells	493
Producing gas wells	15
Shut-in oil wells	198
Shut-in gas wells	14
Temporarily abandoned oil wells	29
Temporarily abandoned gas wells	1
Active water injection wells	371
Active water disposal wells	11
Active water source wells	3
<b>Active Wells (subtotal)</b>	<b>1,135</b>
<b>ABANDONED WELLS*</b>	
Abandoned oil locations	475
Abandoned gas locations	5
<b>Abandoned Wells (subtotal)</b>	<b>480</b>
<b>ALL OTHER WELLS</b>	
Approved oil permits	3
Approved gas permits	0
Dry holes	1,034
Inactive water injection wells	35
Released oil wells**	415
Released gas wells**	8
Released water injection wells**	30
Released water disposal wells**	11
Released water source wells**	20
Unknown well types	96
<b>All Other Wells (subtotal)</b>	<b>1,652</b>
<b>Total</b>	<b>3,267</b>

\*Release pending completion of satisfactorily completed surface reclamation.

\*\*Released: well plugged and abandoned and reclamation satisfactorily completed.

Source: BLM 2005c.

### **3.8.2.1.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

The production of oil and gas in the Monticello PA has primarily occurred in the eastern portion of the PA. A large area of concentrated oil and gas fields occurs in the southeastern portion of the Monticello PA within the Blanding subbasin region of the Paradox Basin. Operations also occur in the northeastern portion of the Monticello PA in the Lisbon Valley area of the Paradox Fold and Fault Belt. Although limited, some oil and gas production has occurred outside these two distinct areas at single well locations.

For purposes of analysis and reporting of the oil and gas resources in the Monticello PA, the PA was divided into 3 exploration and development areas, so delineated based on distinct geologic descriptions, historic/current production activities, and the potential for ongoing and future oil and gas development (Map 57). These areas are the Paradox Fold and Fault Belt, the Blanding Basin area, and the Monument Upwarp area.

The Paradox Fold and Fault Belt, located in the northern part of the Monticello PA, encompasses only 5 oil and gas fields: Lisbon, which straddles the northern Monticello PA border; Lightning Draw; Lightning Draw SE; Paiute Knoll; and a wildcat. Production from the Devonian McCracken Sandstone Member of the Elbert Formation first occurred in the Lisbon field. Later testing in the Mississippian Leadville Limestone resulted in the discovery of a giant oil and gas accumulation, which has resulted in approximately 90% of the oil produced from the Leadville Limestone. Oil and gas accumulations, though no economic production, have also been recorded in the Paradox and Hermosa intervals in the Lisbon field. Both hydrogen sulfide (H<sub>2</sub>S) and helium have also been produced from the McCracken and Leadville reservoirs in the Lisbon field (personal communication with E. Jones, BLM Moab Field Office, June 2004). Production of these commodities as a by-product of oil and gas production is expected to continue. The Lightning Draw field produced oil and gas from the Kane Creek fractured shales. One new gas well (the Federal 1-31) was recently completed in the Lightning Draw SE field, and one well is currently being worked over. Development plans include construction of a pipeline connecting these wells to the existing gathering line and the Lisbon gas processing facility.

Oil and gas were first discovered in the Blanding Basin area of the Monticello PA at Boundary Butte in 1948. Subsequent geophysical work on adjacent Navajo Indian land resulted in the 1956 discovery of the Greater Aneth field, which produces from the Desert Creek zone of the Paradox Formation, with some minor production from the Ismay zone. The Greater Aneth field is by far the most productive field in the Monticello PA (see Table 3.16). There are a host of other Ismay and Desert Creek reservoirs in the Blanding subbasin, accessed by fields such as Bluff and Recapture Creek, which were discovered in the 1950s. Some of the larger producers from these reservoirs include Bug, Cave Canyon, Cherokee, Deadman-Ismay, Kachina, Ismay, Kiva, Mustang Flat, and Tin Cup Mesa fields (see Table 3.15).

Completion of producing wells in the Monument Upwarp area has been sparse compared with the Paradox and Blanding Basin areas. Despite over 150 exploratory wells drilled in this area, only two fields have been established. These two fields, the Mexican Hat field and the Lime Ridge field, are located in the south-central portion of the Monticello PA. The Lime Ridge field managed to develop a significant gas show from Mississippian Leadville Limestone. Other representative activities on the Monument Upwarp include tests at the Nokai Dome in the

southwest portion of the Monticello PA; a well located in T40S, R12E that encountered oil and gas in the Triassic Shinarump Member of the Chinle Formation; a well that had a show of gas in Pennsylvanian sediments (McDougall 2000a); and a 1992 exploratory well drilled in the west-central portion of the Monticello PA that had a significant show of oil and/or gas in the Ismay zone of the Paradox Formation (McDougall 2000b).

### **3.8.2.1.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

Areas of high, moderate, and low potential for the occurrence of oil and gas have been identified for the plays of the Monticello PA (Map 17). The Buried Fault Black play (2101) and the Salt Anticline Flank play (2105) are rated as having a high (H) occurrence potential with a D level of certainty, as are the southeastern portion of the Porous Carbonate Buildup play (2102), and the northern part of the Fractured Interbed Play (2103). Areas rated with an H oil and gas occurrence potential and a C level of certainty are the northwestern portion of the Porous Carbonate Buildup play, on the Monument Upwarp, the western and southern portions of the Fractured Interbed Play, and the Permo-Triassic Unconformity play (2106). The area around the Abajo Mountains is rated with a low (L) occurrence potential for oil and gas with a C level of certainty; the Porous Carbonate Buildup play and the Fractured Interbed play both encroach into this area. The Late Proterozoic (Chuar-sourced) and Lower Paleozoic play (2403) is rated with an H occurrence potential but only a B level of certainty, because this play is only speculative.

The potential for future oil and gas exploration and development in the Monticello PA is based on the history and extent of development in the area, consultation with petroleum companies actively studying fields and plays in the Monticello PA, and discussions with state and federal agencies familiar with activities in the area (see separate oil and gas Reasonable Foreseeable Development document). Based on these factors, potential for oil and gas exploration and development in the Paradox Fold and Fault Belt and Blanding Basin areas of the Monticello PA is rated as high. Less activity is expected in western areas of the Monticello PA on the Monument Upwarp, and development potential there is rated as moderate. The potential for exploration and development around the Abajo Mountains, within national parks or monuments, within WSAs, or within other protected lands, is rated as low.

Existing surface disturbance for approximately 1,135 active wells, approximately 480 abandoned wells, and associated roads and pipelines is 15,504 acres, or an average of 9.6 acres per well. Future oil and gas drilling for the next 15 years is projected to be 5–21 wells per year on all lands in the PA. Assuming an average of 13 wells per year, a total of 195 wells would be drilled within the PA. Disturbance from these wells and associated infrastructure would equal approximately 1,872 additional acres. During this period, 27 dry wells, 20 newly abandoned wells, and all 480 existing abandoned wells should be successfully reclaimed, making 5,059 total acres of reclaimed surface area. Accordingly, the total cumulative surface disturbance for wells in the Monticello PA during the life of this plan is projected to be approximately 12,317 acres. Additionally, surface disturbance over the next 15 years for geophysical exploration (1,230 linear miles) amounts to about 2,236 acres. Reclamation of all these disturbed lands would be successful over the scope of 10 years (BLM 2005c).

### **3.8.2.2 COAL**

Coal resources are allocated through a coal lease. Exploration can occur under license before a lease is issued. Prior to issuing coal leases, areas considered unsuitable for all or certain stipulated methods of coal mining must be identified based on the unsuitability criteria found at 43 CFR Section 3461. These criteria are applied through the BLM's land-use planning process.

#### **3.8.2.2.1 RESOURCE OVERVIEW**

Coal resources are located in the San Juan coal field in the eastern part of the Monticello PA, in the Blanding Basin and Paradox Fold and Fault Belt areas. The coal in this field occurs in the Cretaceous Dakota Sandstone. The middle coal-bearing unit within the Dakota Sandstone, which is 45–122 feet thick and whose individual coal beds range from two to 15 feet thick (Gloyn et al. 1995), contains 4 coal horizons in the Sage Plain area. These coals typically have been of poor quality.

#### **3.8.2.2.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Coal activity in the 530,000-acre San Juan coal field has been limited to 4 areas:

1. exposures of Dakota Sandstone along Recapture and Johnson Creeks in T35S, R22E and R23E, and T36S, R22E and R23E;
2. an area near Monticello where several openings had been reported;
3. prospect holes located in T34S, R26E, including the Crepo Mine and a bulldozed outcrop representing the best showing in the field; and
4. several pits opened in an area located along Piute Creek, including the Rasmussen mine located in T33S, R26E (BLM 1985).

Most production has been conducted for local consumption. Reported activities, including two small mines, primarily occurred prior to 1929, with insignificant production. All mines and prospects have been closed in this area since 1971 (BLM 1985). After drilling several exploration holes near Eastland, Utah in the late 1970s, Arjay Petroleum estimated that 77 million tons of coal may be recoverable by surface mining in their exploration area, but development is limited by poor coal quality and lack of rail transportation (Gloyn et al. 1995; Wilson and Livingston 1980).

#### **3.8.2.2.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

Old coal mines and drill-hole data suggest a high (H) occurrence potential with a D level of certainty for coal in the Cretaceous Dakota Sandstone in a small portion of the San Juan coal field southeast of Monticello. Other areas of the San Juan coal field are rated as having an H occurrence potential, but with a C level of certainty. Due to the poor quality of the coal and the lack of historical activity, development potential is rated low (L).

### **3.8.2.3 POTASH AND SALT**

The potash resource is allocated by a variety of instruments. These are the prospecting permit, the preference right lease, the application for exploration license, the competitive lease, and the fringe acreage lease/lease modification.

#### **3.8.2.3.1 RESOURCE OVERVIEW**

Potash (potassium-bearing) deposits in the Monticello PA, comprising primarily salt, sylvite (potassium chloride, or KCl), and carnallite (hydrated potassium magnesium chloride, or  $\text{KMgCl}_3 \cdot 6\text{H}_2\text{O}$ ), are hosted exclusively by the Pennsylvanian Paradox Formation in the Monticello PA. Known potash and salt deposits underlie a 2,800-square-mile area of the Paradox Basin's deeper northeastern half. Both sylvite and carnallite occur in varying proportions throughout most potash deposits, but sylvite is dominant in those horizons under economic consideration (Hite 1960; Dames and Moore 1978; Gloyn et al. 1995). Using a cutoff grade of 14%  $\text{K}_2\text{O}$ , Patterson (1989) estimates that known resources of  $\text{K}_2\text{O}$  potash contain 254 million tons, while inferred resources are estimated at 161 million tons.

Most of the interest in potash and salt deposits in the Paradox Basin has been concentrated in the fold and fault belt, where potash beds are relatively close to the surface. However, in some areas, extraction is a challenge because salt flow is extensive (up to 13,000 feet thick) and destroys the continuity of the potash deposits (Hite 1960). Although the only commercial deposits in the area are found in the Cane Creek area in the Moab Planning Area, north of the Monticello PA, other potentially valuable deposits are known to occur in the Monticello PA. These include the Lisbon Valley and Gibson Dome areas (Gloyn et al. 1995). In 1960, the USGS classified the Cane Creek and Lisbon Valley areas as Known Potash Leasing Areas (KPLAs)—areas where potentially valuable deposits of potash are known to exist. There also appears to be sufficient data available to define the Gibson Dome area as a KPLA (BLM 2005b).

#### **3.8.2.3.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Potash deposits in the Paradox Basin were initially discovered during the exploration for oil and gas between 1924 and 1944. Based on these initial discoveries, further potash exploration concentrated in Cane Creek and Lisbon Valley and contributed to the classification of these areas as KPLAs in 1960 (Hite 1960). Portions of the Cane Creek and Lisbon Valley KPLAs occur within the northern part of the Monticello PA and extend into the Moab Planning Area. The Moab Salt Company's Cane Creek Mine, located in the portion of the Cane Creek KPLA in the Moab Planning Area, is the sole producer of potash and salt by-product in the region.

Some incidental exploration has occurred in the Gibson Dome area. Oil and gas drilling in this area has contributed data on its potash deposits. In addition, a borehole was drilled in the 1980s by the U.S. Department of Energy for the purpose of evaluating the salt structure in the Gibson Dome area as a potential repository for high-level nuclear waste. This borehole encountered potentially valuable potash-bearing zones (Woodward-Clyde Consultants 1982; Merrell 1979; Dames and Moore 1978).

### **3.8.2.3.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

The two KPLAs in the Monticello PA and the Gibson Dome area are rated as having a high (H) occurrence potential with a D level of certainty for both potash and salt (Map 18). The other areas of known potash and salt deposits in the Paradox Basin are rated as H occurrence potential with C certainty for both commodities. The more expansive areas underlain by potash and salt also have a high (H) occurrence potential and are rated with a C certainty.

A combination of factors, including the high cost of extraction and easier-to-mine deposits outside the PA, contributes to the low (L) development potential for both potash and salt within the Monticello PA.

### **3.8.2.4 TAR SANDS**

The Monticello PA contains areas of tar sands resources. This resource has been, and currently is, available for lease under the Combined Hydrocarbon Leasing Act of 1981 and in accordance with the decisions in the existing BLM land-use plans.

The major tar sand resources lie only in Utah within 11 designated Special Tar Sands Areas (STSAs) managed by the BLM Vernal, Price, Richfield, and Monticello field offices (Map 18). One of these STSAs lies within the Grand Staircase-Escalante National Monument where leasing is prohibited. The Monticello FO manages one of the remaining 10 STSAs.

When the Monticello RMP Revision (revision) was initiated in 2003, there was no reasonable foreseeable development expectation for tar sands over the next 15 years. The mineral report identified this resource, but did not foresee any leasing or development due to prevailing and anticipated economic factors.

Since the start of this RMP revision, Congress enacted the Energy Policy Act of 2005. Section 369 of the Energy Policy Act requires the Secretary of Interior to "complete a programmatic environmental impact statement for a commercial leasing program for oil shale and tar sands resources on public lands, with an emphasis on the most geologically prospective lands within each of the States of Colorado, Utah, and Wyoming." On December 13, 2005, the BLM published a Notice of Intent in the Federal Register initiating a Programmatic Environmental Impact Statement (PEIS) to support a commercial oil shale and tar sands leasing program on federal lands in these 3 states.

In light of this statutory requirement, all decisions related to tar sands leasing in this RMP are being deferred to the ongoing PEIS on Oil Shale and Tar Sands Leasing. The Record of Decision (ROD) on the final PEIS will amend the existing Monticello RMP by changing allocation decisions on whether or not to allow leasing and future development of tar sands on public lands for those areas where the resource is present. These decisions will be incorporated into the Monticello RMP as it is finalized or will amend the Monticello RMP. Combined hydrocarbon and tar sand leasing in the STSAs will also be deferred to the PEIS. Additional opportunities for public involvement and comment will occur when the PEIS becomes available in draft form.

Site-specific requirements will be addressed in future NEPA analysis for specific project applications after the PEIS is completed.

This RMP will, however, develop allocation decisions for conventional oil and gas leasing in the STSAs.

#### **3.8.2.4.1 RESOURCE OVERVIEW**

Since 1981, tar sands have been allocated by competitive leasing. In Special Tar Sand Areas (STSAs), tar sands are leased by competitive bonus bidding for combined hydrocarbon leases (CHLs). Outside STSAs, tar sands are allocated by conventional oil and gas leases.

Tar sand in the Monticello PA has been identified in the White Canyon Designated Tar Sand Area (DTSA, established on January 21, 1981 [46 Federal Register 6077]), which extends over 10,000 acres in the western portion of the White Canyon Slope area and into the Monument Upwarp area, in the western portion of the Monticello PA). The Hoskinnini Member of the Triassic Moenkopi Formation, which hosts the deposit, is exposed in Long, Short, and Fort Knocker Canyons. The deposit is estimated to contain 12 to 15 million barrels of oil in place (McDougall 2000b). From the research done to-date, it appears that the tar sands in the White Canyon DTSA are low-grade and fractured. A second deposit of tar sands in the Monticello PA occurs in the walls of the San Juan River canyon near the Mexican Hat field (BLM 2005b). This deposit, minor compared to the White Canyon area, is found in the Pennsylvanian Honaker Trail Formation. Ritzma (1979) estimated the contained oil to be 0.4 to 0.5 million barrels.

#### **3.8.2.4.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

There has been no exploration or production activity regarding the tar sand deposits located in the White Canyon DTSA (BLM 2005h). Ritzma and Doelling (1969) stated that the Hoskinnini Member in the White Canyon tar sand deposit is "lightly" saturated with oil and that a reconnaissance assessment of the deposit indicates that it is not of commercial significance. Furthermore, the stratigraphy may prevent both in situ thermal recovery of oil and surface mining methods. Compared with the oil and gas resources throughout the Monticello PA that can be extracted with modern drilling and pumping methods, tar sand extraction requires higher-cost mining techniques such as open pits and associated earth-moving and reclamation activities.

#### **3.8.2.4.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

The White Canyon DTSA, along with smaller tar sand deposits near Mexican Hat, are rated as having a high (H) occurrence potential with a D level of certainty. Considering the dearth of leases in the White Canyon DTSA, the lack of interest shown by developers, and the high cost associated with extraction in the Monticello PA, tar sand development potential in the Monticello PA is considered low (L).

### **3.8.3 LOCATABLE MINERALS**

Locatable minerals are subject to disposal by mining claim location under the authority of the Mining Law of 1872. Locatable minerals comprise the base and precious metal ores, ferrous metal ores, and certain classes of industrial minerals. These minerals are allocated via claim staking or location, at the initiative of the public. Operations under the 43 CFR 3809 regulations may take place on public lands that are open to mineral entry without a claim. Surface-disturbing activities (beyond casual use) to explore or develop are not allowed under a claim alone and require a Notice of Intent (NOI) or Mining Plan of Operations (MPO). All public lands within the Monticello PA are open to mineral location unless specifically closed by withdrawal.

#### **3.8.3.1 URANIUM-VANADIUM**

##### **3.8.3.1.1 RESOURCE OVERVIEW**

Sediment-hosted uranium in the Monticello PA occurs in quantities that are commercially extractable. It is usually found intimately associated with vanadium and sometimes copper. The most prolific hosts of the uranium-vanadium mineralization include Mesozoic sequences such as the Moss Back and basal Shinarump Conglomerate Members of the Triassic Chinle Formation, as well as the Salt Wash Member of the Jurassic Morrison Formation, which tends to host deposits that have larger reserves and higher grades and are more closely clustered than those occurring in other formations (Chenoweth 1981; Johnson and Thordarson 1959). Small uranium-vanadium deposits are also found in the late Paleozoic Permian Cutler Group (a result of an unconformity with the Chinle Formation), particularly the Cedar Mesa Formation, as evidenced by historic mining production in the northern part of the Monticello PA (Gloyn et al. 1995).

##### **3.8.3.1.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Although uranium deposits in the Monticello PA had been mined for over 90 years, first for their radium content and then for their vanadium co-product, it was the "Uranium Boom" beginning in the late 1940s that initiated large-scale extraction (Chenoweth 1996). However, a national and international trend of declining uranium and vanadium demand and prices began in the 1980s (Chenoweth 1996; BLM 2005h). The last mines and mills in the Monticello PA closed in 1990.

In the Monticello PA, the greatest amount of production has occurred from the Salt Wash Member of the Jurassic Morrison Formation and the Moss Back and Shinarump Conglomerate Members of the Triassic Chinle Formation. The least amount of production has occurred from the Permian Cutler Group. Mines developed in the Chinle Formation produced 92% of the ore between the early 1950s and the mid-1960s. However, by the mid-1970s, production from the Morrison Formation overtook and slightly exceeded that of the Chinle (\$600 million vs. \$500 million, respectively). Regionally, remaining recoverable reserves of uranium-vanadium are estimated at 4.2 million tons of ore in the Four Corners Region. Approximately 57% of these reserves are hosted in the Morrison Formation, 39% in the Chinle Formation, and 4% in the Cutler Group (Johnson and Thordarson 1959; Gloyn et al. 1995). Table 3.17 lists the mining areas in the Monticello PA and the uranium host deposits for each. Table 3.18 provides a summary of historical mining production in the Monticello PA.

Below are the more notable uranium-vanadium mining operations within the Monticello PA:

- The Cottonwood Wash mining area is centered at the junction of Cottonwood and Brushy Basin Washes, just west of Blanding, Utah. Some 55 properties produced over 350,000 tons of ore between 1931 and the 1980s (see Tables 3.18 and 3.19; Gloyn et al. 1995). There are currently no mining permits filed with UDOGM for this area.
- The Montezuma Canyon mining area includes deposits on the sides of Montezuma Canyon and its tributaries, east of Blanding, Utah. Sixty-eight properties produced about 109,000 tons of ore between the late 1940s and the mid-1980s (see Tables 3.18 and 3.19; Gloyn et al. 1995). Currently, only one mine in the Montezuma Canyon area, the Dusty Mine, has a permit registered with UDOGM; however, it is listed as inactive.
- Only the southeastern portion of the Lisbon Valley mining area is located in the Monticello PA; the rest of it is in the Moab Planning Area. Some of the largest, high-grade uranium-vanadium ore bodies have been mined in this area (see Tables 3.18 and 3.19). Only one mine in the Monticello PA portion of the Lisbon Valley area has a permit registered with UDOGM; it is also listed as inactive.

**Table 3.17. Historical Locations and Hosts of Uranium-Vanadium Deposits in the Monticello PA, by Mining District**

Mining Area	Salt Wash Member/ Morrison Formation	Moss Back Member/ Chinle Formation	Shinarump Member/ Chinle Formation	Cedar Mesa Formation/ Permian Cutler Group
Lisbon Valley Area*		Major		Minor
Combined White Canyon Area (Red Canyon, White Canyon/Fry Canyon, Deer Flat, Elk Ridge, and southern Indian Creek Areas)			X	
Inter-river, Lower Kane Creek, Indian Creek Areas*		Major		Minor
Dry Valley Area	X			
Cottonwood Wash Area	X			
Oljeto Mesa Area (Monument Valley)			X	
Montezuma Canyon Area	X			
Bluff-Butler Wash Area	—	—	—	—
Abajo Area	—	—	—	—
Ucolo Area	X			

Note: Xs indicate that the data say that this host occurs in the mining area. The words "major" and "minor" are used when hosts within a mining area are compared to each other.

Sources: Johnson and Thordarson 1959; Merrell 1979; Chenoweth 1996; Sprinkel 1999; Gloyn et al. 1995; Gloyn 2004.

\*Is also located in the Moab Planning Area to the north.

— No data.

**Table 3.18. Historical Uranium-vanadium Production in the Monticello PA**

Mining Area	Average Ore Grade		Production (lb)		Estimated Reserves (lb U <sub>3</sub> O <sub>8</sub> )	Develop. Potential
	% U <sub>3</sub> O <sub>8</sub>	% V <sub>2</sub> O <sub>5</sub>	U <sub>3</sub> O <sub>8</sub>	V <sub>2</sub> O <sub>5</sub>		
Lisbon Valley Area*	0.30–0.37	0.34–0.40	79,560,000	534,000	3,500,000	High
Combined White Canyon Area	0.25–0.30	0.04	11,069,000	216,000	2,000,000+	High to Moderate
Inter-river, Lower Kane Creek, Indian Creek Areas*	0.20–0.22	1.50–2.00	3,276,000	195,000	unknown	Moderate
Dry Valley Area	0.20	1.00–1.70	1,525,000	12,662,000	1,000,000	High
Cottonwood Wash Area	0.15–0.20	0.96–1.70	896,000	5,664,000	300,000	High
Oljeto Mesa Area (Monument Valley)	0.25–0.30	0.65	323,000	533,000	unknown	Moderate
Montezuma Canyon Area	0.16	0.60	88,000	775,000	unknown	High
Bluff-Butler Wash Area	unknown	unknown	53,000	--	unknown	Moderate
Abajo Area	unknown	unknown	7,000	1,000	unknown	Moderate
Ucolo Area	0.15	1.50–2.00	unknown	unknown	3,000,000	High

\*Includes production from the Moab Planning Area to the north.

Source: Gloyn et al. 1995; Chenoweth 1996; Gloyn 2004.

The White Canyon mining area is located in the northwestern part of the Monticello PA (Gloyn 2004). In addition to uranium and vanadium, ore from the White Canyon area contains from 0.3% to 1.3% copper (Chenoweth 1990, 1993). The Cu:U<sub>3</sub>O<sub>8</sub> ratio is as high as 13:1, and copper grades range up to 1–2% (Johnson and Thordarson 1959). The Red Canyon section of this area contains an estimated two million pounds of U<sub>3</sub>O<sub>8</sub>, while reserves for other areas are unknown (see Tables 3.17 and 3.18; Gloyn 2004). One mine in the White Canyon area has a registered permit with UDOGM; it is classified as being in its final stages of reclamation.

### **3.8.3.1.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

The designated mining areas (Gloyn 2004) within the Monticello PA are rated as having high (H) occurrence potential with a D certainty level (Map 20). Outside these known mining areas, the areal extent of the Jurassic Morrison and Triassic Chinle Formations has been classified as having a moderate (M) occurrence potential with C level of certainty. Where mineralization in the Cutler has occurred in Lisbon Valley mining area, uranium and vanadium has a moderate (M) occurrence potential; otherwise, mineralization in the Cutler is not expected.

Uranium prices have recently reached the level that could encourage some new production from existing reserves in the Monticello PA, and vanadium prices have also recently increased significantly, to the point that vanadium could be a highly desirable co-product or even the primary metal, especially considering the relatively high ratio of vanadium to uranium in most of the Salt Wash deposits in the area (BLM 2005b). Development potential is, therefore, rated H for the Red Canyon, Deer Flat, Cottonwood Wash, Montezuma Canyon, Lisbon Valley, Dry Valley,

and Ucolo mining areas, where known reserves are significant and infrastructure is in place. Development potential is rated M for the White Canyon-Fry Canyon, Oljeto Mesa (Monument Valley), Bluff-Butler Wash, Elk Ridge, Abajo, Indian Creek, Lower Kane Creek, and Inter-river areas. Development potential is rated L for host formations outside designated mining areas.

### **3.8.3.2 COPPER**

#### **3.8.3.2.1 RESOURCE OVERVIEW**

For convenience, copper deposits are divided into two types in this section: vein-type and redbed-hosted. Vein-type deposits are generally fault zone-hosted veins and strata-bound, mineralized layers. As their name suggests, redbed copper deposits form in red host rocks, which get their color (essentially rust) from the oxidation of the rock's exposure to the atmosphere. Redbed mineralization can be either volcanic or sedimentary. Sedimentary-hosted deposits, which form in fluvial (river) environments, are the type found in the Monticello PA. Sedimentary redbed deposits are relatively small in comparison to the volcanic redbed deposits and vein-type deposits, and few are ever brought into production.

Blanket-like deposits of copper mineralization are hosted by late Paleozoic to Mesozoic redbed sequences throughout the Southwest (Hahn and Thorson 2002). In the Monticello PA, copper mineralization has been observed primarily in the Triassic Chinle and Moenkopi Formations (McFaul 2000). These observed copper occurrences have been associated with uranium deposits in several areas, including the White Canyon, Oljeto Mesa (Monument Valley), and Indian Creek mining areas. In the Indian Creek area, the Permian Cutler Group contains deposits representing a transition zone between fluvial rocks to the east and marine rocks to the west. Small uranium-copper deposits are found in this transition of the Cutler Formation, as well as in the overlying Moenkopi Formation.

#### **3.8.3.2.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Copper production in the Monticello PA has often been associated with uranium mining. The White Canyon, Red Canyon, Deer Flat, and Elk Ridge mining areas were the location of redbed, disseminated copper production in the late 1940s and early 1950s. At their local mill, primarily in 1953, the Vanadium Corporation of America attempted to recover copper from uranium-vanadium ore, without success (Chenoweth 1993). Since the 1960s, several other companies have evaluated low-grade, disseminated copper deposits in the Monticello PA and adjacent areas, but attempts at production of these deposits, even in association with uranium and/or during times of favorable copper prices, have been unsuccessful or uneconomical (Hahn and Thorson 2002). Other areas for copper occurrence in the Monticello PA are in the Oljeto Mesa (Monument Valley) and Indian Creek mining areas. Both areas contain limited prospects, and no mining has developed.

### **3.8.3.2.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

Based on available information, there is a high (H) occurrence potential with a D level of certainty for redbed-type copper deposits in the Triassic Chinle Formation in the White Canyon, Oljeto Mesa (Monument Valley), and Indian Creek uranium mining areas. Occurrences in the Moenkopi Formation are isolated, limited to just a few uranium mines in the White Canyon area. Therefore, the Moenkopi in this area is rated as having a moderate (M) occurrence potential with C certainty, while other exposures of Moenkopi are rated as having a low (L) occurrence potential and C certainty.

Throughout the Monticello PA, copper deposits are low-grade and sparse. Even with the increase in prices, copper development potential throughout the PA is rated as being L.

### **3.8.3.3 PLACER GOLD**

#### **3.8.3.3.1 RESOURCE OVERVIEW**

Placer gold in the Monticello PA has been documented to occur sporadically along the Colorado and San Juan rivers and their respective tributaries. Along the Colorado River, it occurs in alluvial bars and has been found in terraces as much as 200 feet above the present river. The gold occurs primarily in the present-day river gravels and in older, higher level terrace gravels (Ritzma and Doelling 1969). Placer gold deposits in San Juan River gravels are known to extend from the mouth of Montezuma Creek to the confluence of the Colorado River (Johnson 1973). In addition to the Colorado and San Juan rivers, placers have also been located in the Abajo Mountains along Johnson Creek and Recapture Creek (Johnson 1973; UGS 2003).

Historical placer operations in the Monticello PA were small-scale, so most of the gold production was not reported. Due to the fine, flaky mode of the gold and the difficulty in recovering it, most operations have not been commercially successful (Butler et al. 1920; UGMS 1966; Johnson 1973; Chatman 1987). The gold grades of historical placer operations range from 0.03 to 0.05 ounces per cubic yard (Gloyn et al. 1995).

#### **3.8.3.3.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Only small, sporadic extraction activities have taken place in the Monticello PA since the late 1980s, and currently, there is little production of placer gold in the Monticello PA. One small, active placer operation is located below the dam on Recapture Creek near Blanding. The BLM also recently accepted a proposal to conduct gold exploration using backhoe trenching on a small site in Johnson Creek (T. McDougall, BLM, 2004). Small-scale operations like these typically have a surface disturbance of 5 to 10 acres.

### **3.8.3.3.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

The known placer gold sites have a high (H) occurrence potential with a D certainty level, given that gold has been produced at these locations. Alluvial deposits along the San Juan River, from the mouth of Montezuma Creek to Lake Powell, are considered to have an H occurrence potential with a C certainty level, as are deposits along Johnson and Recapture Creeks in the Abajo Mountains north of Blanding. Because of the ongoing operation and the recent proposal on Recapture and Johnson Creeks, respectively, these areas are rated as having an H development potential. All other areas are assigned a moderate (M) to low (L) development potential.

### **3.8.3.4 LIMESTONE**

#### **3.8.3.4.1 RESOURCE OVERVIEW**

Desirable limestone deposits in the Monticello PA are primarily hosted in the Pennsylvanian Honaker Trail Formation, but also are in the Jurassic Navajo Sandstone (Gloyn et al. 1995). The marine limestones in the Honaker Trail Formation have been shown to contain small amounts of relatively high-quality limestone in San Juan County (Gloyn et al. 1995). Four lenses, or beds, of the Honaker Trail Formation, each one to 3 feet thick, are observed in the San Juan River canyon west of Mexican Hat (Ritzma and Doelling 1969). A 7-to-10-foot-thick bed containing 97% calcium carbonate (CaCO<sub>3</sub>) has also been reported at a 200- to 300-acre site located on Lime Ridge and northeast of Mexican Hat. Additionally, studies from a site on the Navajo Indian Reservation in the southern portion of the Monticello PA show that limestone in Honaker Trail Formation may be utilized for producing high-quality burned lime, cement rock, and rock dust (Ritzma and Doelling 1969). Outcrops of the Honaker Trail Formation also occur in the northwest portion of the Monticello PA along the Colorado River and its tributaries. Lacustrine limestones in the Jurassic Navajo Sandstone in the Monticello PA contain some beds of high-calcium, blue-gray, cherty limestone that locally cap small mesas (Gloyn et al. 1995).

#### **3.8.3.4.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Current limestone operations in the Monticello PA are primarily on Lime Ridge. The Holliday Construction Lime Ridge quarry is an active operation located on state lands northeast of Mexican Hat. Production from 1998 through 2003 at this site has been reported at approximately 29,000 tons (UDOGM, verbal communication 2004). The Moon No. 4 quarry, also permitted on state lands near Mexican Hat, is now inactive. It was operated by Western Industrial Minerals. An area considered likely for development is the 200- to 300-acre, 7-to-10-foot-thick site occurring on 60 claims and located 13 miles northeast of Mexican Hat on Lime Ridge. The deposit is amenable to simple quarrying techniques (Gloyn et al. 1995).

Exploration and proposed development of chemical-quality limestone has occurred in the Monticello PA in the past:

- Dames and Moore, Inc., under a contract to the Arizona Public Service Company, conducted substantial exploration on two claims for high-calcium limestone in the mid to late 1970s.

These efforts resulted in the identification of the massive, 200- to 300-acre bed of limestone in the Honaker Trail Formation (see above). Development of the deposit was to be used at power plants in New Mexico and Arizona.

- In 1986, the Environmental Lime Corporation submitted a proposal to the BLM regarding a project located northeast of Mexican Hat to produce 1,100 tons per day of high-calcium limestone. No work was ever carried out on this project.
- In 1994, the Navajo Nation drilled core samples on claims located in T41S, R20E, to ascertain whether high-calcium limestone was present and if it could be used for proposed sulfur dioxide scrubbers/absorbers at a power plant in Page, Arizona.

#### **3.8.3.4.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

The identified limestone sites in the Monticello PA have been characterized as having high (H) potential for the occurrence with a D certainty level. Elsewhere in the Monticello PA, the Honaker Trail Formation is characterized as having H potential with C certainty for the occurrence of limestone. Limestone development potential on Lime Ridge is rated as H, not only because of past production in that locale, but because of the significant interest in limestone in southeastern Utah. Development of the formation in the northwest portion of the Monticello PA, along the Colorado River and its tributaries is considered unlikely.

### **3.8.4 SALABLE MINERALS**

Salable mineral materials are subject to disposal by sales contract or free use permit under the authority of the Materials Act of 1947. Salable mineral materials are generally common varieties of construction materials and aggregates. Salable mineral material disposal can be exclusive or nonexclusive. Under exclusive disposals, the applicant has sole rights to the material applied for and sole responsibility for the development and reclamation of the source site. Exclusive sites include negotiated sales sites, competitive sales sites, free use permits, and material sites under the Federal Highway Act. Nonexclusive disposals are made from sites to which the general public has access, such as community pits and common use areas (see Appendix K). Detailed descriptions of the salable mineral materials in the Monticello PA and their locations, disposal, and production are provided in the Mineral Potential Report (BLM 2005b).

#### **3.8.4.1 SAND AND GRAVEL**

##### **3.8.4.1.1 RESOURCE OVERVIEW**

Sand and gravel development is largely driven by the need to find suitable material for public works projects, including local and state road projects and community development. Sand and gravel are the rock products that have the greatest demand in the Monticello PA, and the operations are widely dispersed across the PA to facilitate distribution of the materials and keep the costs to consumers low. They are commonly found near population centers and aligned along roadways. Sand and gravel deposits are mostly associated with unconsolidated Quaternary sediments. Important sand and gravel deposits occur along the San Juan River (where it is high-

quality), surrounding the Abajo Mountains (where the material is softer and not as suitable for concrete aggregate), and near the town of Blanding.

#### **3.8.4.1.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

A review of LR 2000 records indicates that since 1989, there have been 57 authorizations made by the BLM for mining of sand and gravel in the Monticello PA, for a cumulative total of 1.9 million cubic yards (BLM 2005h). Production has primarily occurred in the eastern and southern portion of the Monticello PA, from alluvial deposits located along the San Juan River, and from sediments (i.e., erosional surfaces of low relief that slope away from the base of mountains) in the vicinities of Blanding and Monticello. Due to transportation costs, most production has occurred in close proximity to road infrastructure, communities, and specific points of use. The main producers are the Utah Department of Transportation and the County Highway Department. Surface disturbance is typically two to 10 acres for each authorization.

#### **3.8.4.1.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

All of the known alluvial deposits, such as those along the San Juan River, are rated as having high (H) sand and gravel occurrence potential and with a D level of certainty. Deposits located within 3 miles of a road are rated as having an H development potential, whereas deposits located further from roads have a moderate (M) development potential (Map 19).

### **3.8.4.2 BUILDING STONE**

#### **3.8.4.2.1 RESOURCE OVERVIEW**

Within the Monticello PA, sandstone appropriate for use as a high-quality building stone is present in the Triassic Moenkopi and Chinle Formations, the Jurassic Kayenta and Morrison Formations, and the Cretaceous Dakota Sandstone and Cedar Mountain Formation (Atwood and Doelling 1982). Sandstones in the Triassic Chinle Formation and the Jurassic Navajo Sandstone are also suitable for commercial crushing operations (Ritzma and Doelling 1969). The granites of the Abajo and La Sal Mountains may also have building stone potential (Gloyn et al. 1995).

#### **3.8.4.2.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Building stone production in the Monticello PA has primarily occurred from the Cretaceous Dakota Sandstone at quarries located southeast of Blanding (UDOGM, verbal communication 2004). Production has also occurred from operations in the Jurassic Kayenta and Triassic Moenkopi and Chinle Formations. Since 1989, there have been 7 authorizations made by the BLM for mining building stone, which have yielded a cumulative total of approximately 130 tons (BLM 2005h). Most of the production in the Monticello PA has occurred on unpatented mining claims, 6 of which are recorded with the BLM, so no production figures are available. Total surface disturbance for an operation is typically 5 to 10 acres.

### **3.8.4.2.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

Known sites of building stone production in the Monticello PA are rated as having a high (H) potential for occurrence with a D level of certainty. Elsewhere, the formations are classified as having a moderate (M) occurrence potential and a C level of certainty. Development potential, particularly in the general areas where there has been previous production, and considering the continued demand for building stone in the growing communities of the West, is rated as H.

### **3.8.4.3 CLAY**

#### **3.8.4.3.1 RESOURCE OVERVIEW**

Bentonite and bentonitic clays—among the most commercially desirable clays—swell when saturated with water and can be used as a natural sealant for reservoirs, stock ponds, ditches, and landfill linings. Several geologic units in the Monticello PA have potential for bentonite production: the Triassic Petrified Forest and Monitor Butte Members of the Chinle Formation (where it is ubiquitous throughout the Monticello PA), the Cretaceous Brushy Basin and Westwater Canyon Members of the Morrison Formation, and the Cretaceous Mancos Shale (Gloyn et al. 1995). Triassic bentonite deposits can be found southeast of Mexican Hat, as well as near Monument Valley, Clay Hills and Comb Ridge (Gloyn et al. 1995). The thickness and purity of the bentonite is quite variable, but very pure deposits have nonetheless been located. Samples taken from the upper portion of the Brushy Basin Member of the Jurassic Morrison Formation in the Lisbon Valley north of the Monticello PA have a measured bentonite content exceeding 90% (Gloyn et al. 1995). Samples taken from the undifferentiated Brushy Basin at Montezuma Creek also averaged more than 90% bentonite.

#### **3.8.4.3.2 PAST AND PRESENT EXPLORATION, DEVELOPMENT, AND PRODUCTION**

Small-scale mining of bentonite for local engineering purposes has occurred in the Monticello PA. In 1977, the Butterfield mine southeast of Montezuma Creek is known to have produced about 5,000 cubic yards of bentonitic clays from the Brushy Basin Member of the Jurassic Morrison Formation (Gloyn et al. 1995). Two other mine sites located in the southwest portion of the Monticello PA have produced bentonitic clay from the Triassic Chinle Formation. Since 1989, the LR 2000 records indicate that 6 BLM authorizations for exploration and production have been issued and have yielded 550,000 cubic yards of clay (BLM 2005h), or less than one authorization and approximately 92,000 cubic yards every two and a half years over the past 15 years. Surface disturbance for each authorization is typically one to 5 acres.

#### **3.8.4.3.3 OCCURRENCE AND DEVELOPMENT POTENTIAL AND REASONABLE FORESEEABLE DEVELOPMENT (RFD)**

Given available information, known bentonite clay sites in the Monticello PA have been classified as having a high (H) potential for occurrence with D certainty level. Elsewhere the favorable formations are rated as having a moderate (M) occurrence potential with C certainty. Based on past use, it is likely that there will be continued development (or H development

potential) in the Monticello PA of bentonite clay resources for engineering applications, particularly around areas where there has been previous production.

## **3.9 NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS**

### **3.9.1 BACKGROUND AND HISTORY**

Since wilderness study areas (WSAs) were established in the 1980s, wilderness in Utah has become a prominent national issue. For more than 20 years, the public has debated which lands have wilderness characteristics and should be considered by Congress for wilderness designation. As a result of the debate (and a significant passage of time since the BLM's original inventories), in 1996 the Secretary of the Interior directed the BLM to take another look at some of the lands in question. In response to the direction of the Secretary, the BLM inventoried these lands and approximately 2.6 million acres of public land statewide (outside of existing WSAs) were found to have wilderness characteristics (BLM 1999b). Although the Glossary defines "wilderness characteristics" in detail, for purposes of inventory maintenance for this plan revision, the BLM focused on the following criteria: 1) the appearance of naturalness, 2) outstanding opportunities for solitude or primitive or unconfined recreation, and 3) an area with a minimum of 5000 acres in size (with some exceptions) so as to make practicable the management of wilderness characteristics (see also Glossary).

Non-WSA lands with wilderness characteristics are areas having 5,000 acres, or areas less than 5,000 acres that are contiguous to designated wilderness, WSAs or other administratively endorsed for wilderness management lands or, in accordance with the Wilderness' Act's language, areas "of sufficient size as to make practicable its preservation and use in an unimpaired condition." The BLM used the same criteria for determining wilderness characteristics as in the 1979 wilderness inventory. The 5,000 acre value was helpful to the BLM in making preliminary judgments, but it was not considered a limiting factor.

In September 2005, the BLM and the State of Utah, the Utah School and Institutional Trust Land Administration (SITLA), and the Utah Association of Counties (collectively "Utah") reached an agreement negotiated to settle a lawsuit originally brought in 1996 by Utah, challenging the BLM's authority to conduct new wilderness inventories. The settlement stipulated that the BLM's authority to designate new WSAs expired no later than October 21, 1993. The BLM, however, does have the authority to manage for characteristics associated with the concept of wilderness through the land-use planning process. The BLM's Land Use Planning Handbook (BLM 2005a) states that decisions on whether or not to protect wilderness characteristics are to be considered during planning. Refer to *Wilderness Characteristics* in the glossary.

### **3.9.2 PLANNING AREA PROFILE**

There are 29 areas in the Monticello PA, outside of existing WSAs that the BLM determined to have the wilderness characteristics of size, naturalness, and outstanding opportunities for solitude or primitive recreation. The BLM found in the 1999 Inventory that there were approximately 485,525 acres within the Monticello PA that had wilderness characteristics.

In addition to the 485,525 acres found to have wilderness characteristics in the 1999 Utah Wilderness Inventory, additional lands in the Monticello PA have been reviewed for wilderness characteristics by the BLM. These are lands currently proposed for wilderness as part of S.1170, America's Red Rock Wilderness Act of 2007, and are neither WSAs nor a part of the 1999 Utah Wilderness Inventory (Note: The Act has been introduced in this year's Congress as S.1170.) The process used by the BLM to determine the non-WSA acreage with wilderness characteristics consisted of several steps. The BLM used a combination of field visits, data layers including roads, vegetative treatments, (especially chaining), range improvements, and rights-of-way, aerial photography interpretation, and interdisciplinary review to reach a conclusion on those acreages that have wilderness characteristics. This process resulted in a determination that an additional 96,832 acres have the wilderness characteristics of size, naturalness, and outstanding opportunities for solitude or primitive recreation.

The processes described above resulted in 29 areas of non-WSA lands with wilderness characteristics totaling 582,360 acres (Table 3.19). These non-WSA lands with wilderness characteristics have been carried through this land-use planning process to determine how their wilderness characteristics will be managed. Many of the inventoried lands were found to lack wilderness characteristics; these are discussed in staff reports available in the Monticello FO.

**Table 3.19. Summary of Lands Evaluated for Wilderness Characteristics**

<b>Name of Lands</b>	<b>Total Acreage Evaluated</b>	<b>Non-WSA Lands with Wilderness Characteristics (Acres)</b>	<b>Non-WSA Lands without Wilderness Characteristics (Acres)</b>	<b>Adjacent Lands with Wilderness Characteristics</b>
Allen Canyon	6,410	0	6,410	NA
Arch Canyon	13,600	50	24,700	Contiguous to Mule Canyon WSA
Bridger Jack Mesa	27,170	23,050	4,120	Contiguous to Bridger Jack Mesa WSA and to lands administratively endorsed for wilderness in Canyonlands National Park
Butler Wash	3,040	1,660	1,380	Contiguous to Butler Wash and South Needles WSA and to lands administratively endorsed for wilderness in Canyonlands National Park
Cheesebox Canyon	16,080	13,240	2,840	Contiguous to Cheesebox Canyon WSA and lands administratively endorsed for wilderness in Natural Bridges National Monument
Copper Point	4,420	0	4,420	NA
Comb Ridge	16,400	13,760	2,637	
Cross Canyon	2,100	1,350	745	Contiguous to Cross Canyon WSA

**Table 3.19. Summary of Lands Evaluated for Wilderness Characteristics**

<b>Name of Lands</b>	<b>Total Acreage Evaluated</b>	<b>Non-WSA Lands with Wilderness Characteristics (Acres)</b>	<b>Non-WSA Lands without Wilderness Characteristics (Acres)</b>	<b>Adjacent Lands with Wilderness Characteristics</b>
Dark Canyon	67,850	66,330	1,520	Contiguous to Dark Canyon WSA and to the Forest Service's Dark-Woodenshoe Canyon Wilderness and lands administratively endorsed for wilderness in Canyonlands National Park and Glen Canyon National Recreation Area
Fish and Owl Creeks	28,740	24,650	2,090	Contiguous to Fish Creek Canyon WSA
Fort Knocker Canyon	12,800	12,410	390	
Gooseneck	3,840	3,570	270	Non-WSA lands with wilderness characteristics shared with the Moab Field Office. Only those acreages in the Monticello FO are shown. Also contiguous to lands administratively endorsed for wilderness in Canyonlands National Park
Grand Gulch	58,010	55,240	2,770	Contiguous with Grand Gulch ISA Complex and lands administratively endorsed for wilderness in Glen Canyon National Recreation Area
Gravel and Long Canyons	37,100	36,890	167	
Hammond Canyon	4,700	4,700	0	
Harmony Flat	10,200	9,660	540	Contiguous with lands administratively endorsed for wilderness in Natural Bridges National Monument
Harts Point	57,796	24,740	31,582	Non-WSA lands with wilderness characteristics shared with the Moab Field Office. Only those acreages in the Monticello FO are shown.

**Table 3.19. Summary of Lands Evaluated for Wilderness Characteristics**

<b>Name of Lands</b>	<b>Total Acreage Evaluated</b>	<b>Non-WSA Lands with Wilderness Characteristics (Acres)</b>	<b>Non-WSA Lands without Wilderness Characteristics (Acres)</b>	<b>Adjacent Lands with Wilderness Characteristics</b>
Hatch/Lockhart	23,320	1,760	21,560	Non-WSA lands with wilderness characteristics shared with the Moab Field Office. Only those acreages in the Monticello FO are shown.
Indian Creek	25,230	23,280	1,950	Contiguous to Indian Creek WSA and to lands administratively endorsed for wilderness in Canyonlands National Park
Lime Creek	5,560	5,560	0	Contiguous to Road Canyon WSA
Mancos Mesa	73,900	61,570	11,710	Contiguous with Mancos Mesa WSA
Monument Canyon	18,180	0	18,180	NA
Nokai Dome	94,330	94,270	60	Contiguous with lands administratively endorsed for wilderness in Glen Canyon National Recreation Area
Red Rock Plateau	62,150	17,010	45,140	
Road Canyon	13,900	11,320	2,580	Contiguous to Road Canyon WSA
San Juan River	15,100	14,340	400	
Shay Mountain	15,020	6,710	8,310	
Sheep Canyon	4,700	4,000	702	Contiguous to lands administratively endorsed for wilderness in Glen Canyon National Recreation Area
Squaw and Papoose Canyon	3,750	3,570	182	Contiguous to Squaw and Papoose Canyon WSA
The Needle	10,740	0	10,740	NA
The Tabernacle	7,440	0	7,440	NA
Tin Cup Mesa	15,900	0	15,900	NA
Upper Red Canyon	25,080	24,920	160	
Valley of the Gods	14,560	13,670	890	

**Table 3.19. Summary of Lands Evaluated for Wilderness Characteristics**

<b>Name of Lands</b>	<b>Total Acreage Evaluated</b>	<b>Non-WSA Lands with Wilderness Characteristics (Acres)</b>	<b>Non-WSA Lands without Wilderness Characteristics (Acres)</b>	<b>Adjacent Lands with Wilderness Characteristics</b>
White Canyon	12,980	9,080	3,900	Contiguous to Dark Canyon WSA/ISA Complex
<b>Totals</b>	<b>805,686</b>	<b>582,360</b>	<b>236,385</b>	

<sup>1</sup> The names of these lands are conglomerates of many parcels and may not track to the names given by other groups or public

<sup>2</sup> These are GIS numbers and may not exactly track to previously published numbers

Non-WSA lands with wilderness characteristics analyzed in this document include about 582,360 acres of BLM-administered public land within the Monticello PA. Additional information concerning these lands is contained in Appendix O. Detailed information about non-WSA lands with wilderness characteristics is part of the administrative record at the Monticello FO and includes: 1) 1999 Utah Wilderness Inventory; 2) 1999 Utah Wilderness Inventory Revision Document for the Monticello FO; 3) 1999 Utah Wilderness Inventory Case Files for the Monticello FO; 4) Reasonable Probability Determinations for the Monticello FO; and 5) Documentation of Wilderness Characteristics Review for the Monticello FO.

## **3.10 PALEONTOLOGICAL RESOURCES**

### **3.10.1 RESOURCE OVERVIEW**

Paleontology is a biological and geological scientific discipline involving the study of fossil materials. Paleontological resources, or fossils, include the body remains, traces, or imprints of plants or animals that have been preserved in the Earth's crust. Among paleontologists, fossils are generally considered to be scientifically significant if they are unique, unusual, or rare; diagnostically or stratigraphically important; or add to the existing body of knowledge in a specific area of the science. The BLM considers all vertebrate fossils to be scientifically significant. Invertebrate and plant fossils may be determined to be significant on a case-by-case basis.

Paleontological resources identified on public lands are considered by the BLM as constituting a fragile and nonrenewable scientific record of the history of life on earth, and are thus considered to represent an important and critical component of America's natural heritage. Once damaged, destroyed, or improperly collected, their scientific and educational value may be reduced or lost forever. In addition to their scientific, educational, and recreational values, paleontological resources can be used to inform land managers about interrelationships between the biological and geological components of ecosystems over long periods of time.

Young alluvial deposits or deep soils may cover and obscure sedimentary bedrock, and any fossils that may occur in that bedrock would be unidentifiable or irretrievable prior to

disturbance actions. In most of these cases, the fossil resources can not be quantified, but the potential for impacting paleontological resources should be addressed in the proposals.

The types of fossils preserved in a sedimentary rock sequence depend on the geologic age of the rocks in which they occur and the environment in which the sediments that comprise the rocks accumulated. Rocks that crop out (are exposed) at the surface of an area and can potentially yield fossils are the result of geologic (depositional, structural, and erosional) history. Geologic formations and sediments exposed at the surface in the Monticello PA range from Pennsylvanian to Recent in age. General geologic mapping of the Monticello PA is available as Hintze's (1975) Geological Highway Map, digitally by Hintze et al. (2000), and in published USGS 2 degree sheets (scale 1:250,000) by Haynes et al. (1972) and Hackman et al. (1973). More detailed descriptions of the geology of the Monticello PA are provided in the Mineral Potential Report.

In the Monticello PA, fossil-bearing sedimentary rocks range in age from Pennsylvanian to Quaternary and represent parts of the 3 great periods of Earth history during the Phanerozoic (*phaneros* = visible, *zoic* = life) eon: the Paleozoic, Mesozoic, and Cenozoic. Fossils preserved in these deposits include invertebrate, vertebrate, plant, and trace fossils. Mesozoic age rocks are most abundant and the only Cenozoic rocks are Quaternary in age. Cenozoic rocks older than Quaternary age that may have been present have been removed by erosion. Vertebrate fossils from the Monticello PA include the body remains of fish, amphibians, reptiles (including dinosaurs), and mammals, as well as tracks and traces of terrestrial animals. These fossils occur in rocks of Pennsylvanian, Permian, Triassic, Jurassic, Cretaceous, and Quaternary age and include some specimens known from nowhere else.

Within the Monticello PA, scientifically significant or important and valuable vertebrate and non-vertebrate paleontological resources are most abundant in the Cedar Mountain, Burro Canyon, Morrison, and Chinle Formations (Classes 4 and 5), and are locally present but less abundant in the Mancos, Dakota, Summerville, Kayenta, Moenave, Moenkopi, Cutler, Rico, and Hermosa Formations (Class 3). Scientifically significant or important vertebrate and non-vertebrate fossils occur but are generally uncommon in Pleistocene-age surficial deposits—that is, the Bluff, Entrada, Curtis, Carmel, Navajo, and Wingate Formations, and in the White Rim Sandstone Member of the Cutler Formation (Class 2). Scientifically significant or important vertebrate and non-vertebrate fossils do not occur in relatively young (Holocene-age) surficial deposits (Class 2), or in igneous rocks such as the Abajo Mountain Intrusives, Minette Intrusives, and Explosion Breccia of volcanic origin (Class 1).

A search of the Utah Geological Survey (UGS) fossil database in Salt Lake City revealed a total of 311 fossil localities in the Monticello PA (Personal communication from M. Hayden to G. F. Winterfeld, Erathem-Vanir Geological, in 2003). Of these, 74 yield vertebrate fossils; 135 yield invertebrate fossils; 88 yield plant fossils; and 42 yield vertebrate trace fossils. Information from this database supplemented by published references and personal experience documents that vertebrate fossils (which the BLM considers of scientific significance) are known from 19 geologic units (formations or members).

### **3.10.2 CURRENT MANAGEMENT PRACTICES**

The BLM has identified 4 objectives for the management of fossil resources on lands it administers. They are: 1) locating, evaluating, managing, and protecting fossil resources; 2) facilitating appropriate scientific, educational and recreational uses of fossils; 3) ensuring that proposed land uses do not inadvertently damage or destroy important fossil resources; and 4) fostering public awareness of the Nation's rich paleontological heritage. Uniform procedural guidance for management of paleontological resources on BLM lands is provided by the BLM's Paleontology Resources Management Manual and Handbook H-8279-1 (BLM 1998a).

Collection of fossils from BLM-administered lands in the Monticello PA is allowed with some restrictions, depending on the significance of the fossils and the place of collection. Under existing regulations, recreational collection of common invertebrate or plant fossils by the public is allowed in reasonable quantities using hand tools. Exceptions to this include except in developed recreation sites or areas or where otherwise prohibited and posted. The public is also allowed to collect petrified wood without a permit for personal, noncommercial purposes. Petrified wood is treated by the BLM as a mineral material rather than as a fossil. Individuals can collect up to 25 pounds plus one piece per person per day, with a maximum of 250 pounds in one calendar year. Current regulations do not allow any commercial collecting of paleontological resources, but a commercial permit may be obtained for the collection and sale of petrified wood.

Recreational collecting of vertebrate fossils, as well as noteworthy fossil invertebrates and plants, is prohibited on all BLM-administered lands. Vertebrate fossils are the remains or traces of animals with backbones such as fish, turtles, dinosaurs, mammals, reptiles, and birds, and include material such as fossil bones, teeth, tracks, coprolites, and burrows. Significant plant and invertebrate fossils are determined on a case-by-case basis.

Professional paleontologists conducting research or assessment and mitigation are primarily regulated through the permit process. Two types of paleontological resource use permits are issued. The basic permit is a survey and limited surface collection permit, issued for reconnaissance work and collection of surface finds, with a one-square-meter limit on surface disturbance. If disturbance during the paleontological work will exceed this limit, or will require mechanized equipment, the researcher must apply for an excavation permit. Prior to authorization of an excavation permit, the BLM must prepare an environmental assessment of the proposed location. All fossils collected under a permit remain public property, must be placed in an approved repository, and never can be sold. Annually, the BLM issues one or two paleontological resource use permits specifically for the Monticello PA (Personal communication with Laurie Bryant, 2003). There are also approximately 12 statewide research permits allowing surface collecting/reconnaissance that would include the Monticello PA. In addition, the BLM issues approximately 8 consulting permits annually in Utah, all of which are statewide and thus include the Monticello PA. The number of amateurs involved in collecting is unknown. The Monticello FO receives several inquiries each year regarding fossil collection. Certainly many important paleontological discoveries have been and will continue to be made by amateurs or those who accidentally encounter fossils, but the number of such discoveries is also unknown.

The BLM favors the development of museum exhibits and informational kiosks or similar developments at roadside turnouts over the interpretation of areas where fossils remain in the ground. These projects provide opportunities for learning and enjoyment. There may be substantial risk of damage or unauthorized collecting of fossils by the public in interpretive areas that are not staffed.

### **3.10.3 RESOURCE ISSUES**

Fossil theft and vandalism is a problem within the FO boundaries. Public interest in fossils and the commercial value of fossils have increased significantly in recent years. As public interest waxes and the prices of fossils rise, federal land managing agencies (including the BLM) are under increasing pressure to both protect scientifically significant fossil resources and to ensure their appropriate availability to the general public. Escalating commercial values of fossils also means that increasingly, fossils on federal lands are subject to theft and vandalism. These crimes reduce scientific and public access to scientifically significant and instructive fossils and destroy the contextual information critical for interpreting the fossils. As described in Title 43 CFR Subparts 8365.1-5 and 8360.0-7, willful disturbance, removal and destruction of scientific resources or natural objects on federal lands is illegal and there are penalties for such violations. Often, the most pronounced damage is the loss of the context and other significant scientific data, the worth of which is difficult to evaluate in monetary terms.

### **3.10.4 SENSITIVITY EVALUATION**

The Monticello FO uses two systems to classify its lands with regard to paleontological resources: the Paleontology Condition System, which is in standard use, and the Probable Fossil Yield Potential, which has been informally adopted by some state BLM offices.

The Paleontology Condition System classifies areas according to their potential to contain vertebrate fossils, or noteworthy occurrences of invertebrate or plant fossils. According to the BLM Handbook 8270-1 (BLM 1998a, revised), this system uses the following classifications:

Condition 1: Areas that are known to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. Consideration of paleontological resources will be necessary if the Field Office review of available information indicates that such fossils are present in the area.

Condition 2: Areas with exposures of geological units or settings that have high potential to contain vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils. The presence of geologic units from which such fossils have been recovered elsewhere may require further assessment of these same units where they are exposed in the area of consideration.

Condition 3: Areas that are very unlikely to produce vertebrate fossils or noteworthy occurrences of invertebrate or plant fossils based on their surficial geology, igneous or metamorphic rocks, extremely young alluvium (sediment deposited by flowing water), colluvium (a loose deposit of rock debris accumulated through the action of gravity) or eolian (carried by the wind) deposits, or the presence of deep soils. However, if possible, it should

be noted at what depth bedrock may be expected in order to determine if fossiliferous deposits may be uncovered during surface-disturbing activities (BLM 1998a, revised).

The Probable Fossil Yield Potential is a planning tool involving the rating of geological units, usually at the formation or member level, according to the probability of yielding paleontological resources that are of concern to land managers. The classes include the following (personal communication from D. Hanson to G. F. Winterfeld, Erathem-Vanir Geological, 2003):

*Class 1:* Igneous and metamorphic (tuffs are excluded from this category) geologic units or units representing heavily disturbed preservational environments that are not likely to contain recognizable fossil remains.

*Class 2:* Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.

*Class 3:* Fossiliferous sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence. Also sedimentary units of unknown fossil potential.

*Class 4:* Geologic units that are Class 5 units (see below) that have lowered risks of human-caused adverse impacts and/or lowered risk of natural degradation.

*Class 5:* Highly fossiliferous geologic units that regularly and predictably produce vertebrate fossils and/or scientifically significant nonvertebrate fossils, and that are at risk of natural degradation and/or human-caused adverse impacts.

## **3.11 RECREATION**

### **3.11.1 RESOURCE OVERVIEW**

The Monticello PA (previously referred to as the San Juan Resource Area in the 1991 RMP [BLM 1991a]) administers an area that has gained international recognition for its extraordinary natural beauty and numerous recreational opportunities. In addition to the recreational amenities it manages, the Monticello PA is near several popular destinations managed by other federal and state land management agencies. These areas include Glen Canyon National Recreation Area (NRA), Monument Valley, Canyonlands NP, Goosenecks State Park, Hovenweep National Monument and Natural Bridges National Monument.

The Moab PA, internationally recognized for its recreation resources as well, borders the northern edge of the Monticello PA. As the popularity of the entire region has increased, seasonal visitation and demand for a variety of recreational opportunities in the Monticello PA has increased as well. These opportunities include: hiking, biking, boating, cultural resource viewing, camping, off-highway vehicle (OHV) use, rock climbing, horseback riding, hunting, wildlife viewing, sightseeing and scenic photography. Visitation in the Monticello PA occurs throughout the year, while the busy seasons occur in the spring and fall.

### **3.11.2 CURRENT MANAGEMENT PRACTICES**

Although San Juan County is actively promoting itself as a recreational destination, BLM facilities and recreation staff remains limited. There have been major increases in recreational

visitation and use over the last 15 years, and impacts to other resources derived from recreation have been identified.

### 3.11.2.1 RECREATION OPPORTUNITY SPECTRUM (ROS)

The ROS is a tool used by BLM recreation planners to identify existing outdoor recreational opportunities and management potential, based on a combination of 3 criteria: recreational activity, setting, and experience. Utilizing the ROS system, the range of recreational opportunities in the Monticello PA is divided into the 6 management classes described below (BLM 1991a). Please see Map 35 for the location of each of these current classes throughout the FO. The Recreational Opportunity Spectrum (ROS) will not be carried forward in any of the action alternatives.

- **Primitive (P):** These areas are characterized by a roadless, essentially unmodified natural environment. Approximately 245,723 acres are currently managed to be essentially free from evidence of human use. Activities allowed are those that would protect the primitive recreational activities, settings, and experiences.
- **Semiprimitive Nonmotorized (SPNM):** These areas are characterized by a roadless, predominantly unmodified environment. Approximately 550,537 acres are currently managed to provide a predominantly natural environment with limited evidence of human use. The recreational goal in these areas is to provide not more than 20 group-encounters a day.
- **Semiprimitive Motorized (SPM):** These areas are the same as Semiprimitive, except that motorized use is permitted. Approximately 375,074 acres are currently managed similarly to P-class areas, but motorized boat use on the San Juan River is allowed.
- **Roaded Natural (RN):** These areas are characterized by a generally natural environment, with evidence of natural resource modification and use that is in harmony with the natural environment. Approximately 725,510 acres are currently managed to maintain this generally natural environment.
- **Rural (R):** These areas are characterized by a substantially modified natural environment. Approximately 14,286 acres are currently managed for unlimited access and high visitation, while still in harmony with the natural environment.
- **Urban (U):** These areas are characterized by a user-intensive, developed, and modified resource setting. Approximately 2,371 acres are currently managed for high visitation and development.

### 3.11.2.2 THE SAN JUAN RESOURCE MANAGEMENT PLAN

The 1991 San Juan RMP (BLM 1991a) for the Monticello FO is the current guiding document for recreation management throughout the San Juan Resource Area (SJRA). The management objectives are: "to develop recreation sites; to designate SRMAs and manage so as to protect recreational opportunities in accordance with RMP goals; to manage public lands to preserve most ROS P-Class areas and protect most ROS SPNM-class areas in accordance with RMP goals; to designate all of SJRA as Open, Closed, or Limited for outstandingly remarkable value

(ORV) use, depending in part on ROS classes and on the need to recognize critical environmental values in specific areas" (BLM 1989).

### **3.11.2.3 OFF-HIGHWAY VEHICLE MANAGEMENT (OHV)**

The San Juan RMP (BLM 1991a) defines the level of OHV opportunities, and the reasons for OHV closure areas. Currently there are 611,310 acres open to OHV use without restrictions, 540,260 acres designated as limited use with seasonal restrictions, 570,390 acres designated as limited to existing roads and trails, 218,780 acres limited to designated roads and trails and 276,430 acres closed to OHV use in the Monticello PA. No maps or inventories were completed for the areas where travel is limited to existing roads and trails. Additionally, the Monticello FO has not completed a designation process for the areas where travel is limited to existing roads and trails.

Off-highway vehicle use is monitored intermittently in 4 areas in the PA, including Fish Creek Canyon, Butler Wash, Bridger Jack Mesa and Indian Creek. Monitoring includes the determination of the number of tracks encountered along a transect, the type of tracks observed, and any vehicles observed. The monitoring report concludes with any recommended action or immediate on-the-ground action. Photographic logs are also kept to document resource damage. All WSAs in the PA are monitored for OHV intrusions.

Areas that have intense OHV use include Butler Wash, Comb Wash, Montezuma Creek, Indian Creek, and Hole in the Rock Trail. Demand for OHV activities is expected to continue to increase in the Monticello PA. This will place demands on the FO to provide for and monitor motorized users. This upcoming demand also has implications for OHV designation and for route marking.

There are active OHV groups, both local and national, that want to see improved management from the BLM in terms of OHV route development and opportunities. The BLM has received comments from the public asking for marked OHV trails and trailhead facilities and staging areas. The BLM has also received numerous complaints about OHV use, misuse, and illegal trail building. There is a growing level of conflict between motorized and nonmotorized users of the PA (see Section 3.11.4.3, User Conflicts).

The Monticello FO has received increased requests from commercial companies for special recreation permits (SRPs) related to OHV guiding and tours, as well as from groups that organize group events such as the San Juan ATV Safari and the Jeep Jamboree.

The Utah Division of State Parks and Recreation monitors OHV registration through the Utah Division of Motor Vehicles (DMV). The following data show a dramatic increase in OHV ownership in the State of Utah and San Juan County during the past 5 years. (Note: OHV registrations include all-terrain vehicles [ATVs], non-street legal motorbikes, snowmobiles and dune buggies. Vehicles that are street legal, such as jeeps and trucks, are licensed, and are not considered OHVs for registration purposes.)

**Table 3.20. OHV Registrations in 1998, 2002, and 2003**

	1998	2002	2003	Percent Increase
Statewide	77,361	160,583	167,174	216%
San Juan County	342	914	961	28%

Source: Personal communication between Julie Nelson, DMV Analyst, and David Harris, SWCA Environmental Consultants, April 8, 2004.

An OHV Survey completed by the Institute for Outdoor Recreation and Tourism entitled Off-Highway Vehicle Four-Wheeler Survey (Reiter and Blahna 1998b), summarizes the use characteristics of visitors to the Moab Easter Jeep Safari. The results of this study can be extrapolated as a representation of all OHV users in the region, and is relevant also to the Monticello PA. Typical expectations of OHV users include scenery, naturalness, seeing a new area, and remoteness. Socializing within one's group was also identified as a high expectation of this user group. Typical users were not characterized as risk takers. The primary management priorities of this user group are to:

- protect natural resources;
- not close or restrict use on any existing routes;
- provide new trails;
- mark and sign popular routes;
- let existing trails get more difficult; and
- emphasize information and educational approaches to minimize impacts and to inform and educate OHV recreationists (Reiter and Blahna 1998a).

#### **3.11.2.4 SPECIAL RECREATION PERMITS (SRPs)**

With 89 land-and river-based commercial outfitters in the Monticello PA for 2006, guiding and events are becoming an increasingly important part of the local San Juan County economy. However, permitting is a time-consuming activity for BLM staff because a NEPA environmental analysis must be completed before a permit can be issued. A Cost Recovery Program is in place for any NEPA proposal that is estimated to take more than 50 hours of BLM specialists' time. The types of SRPs issued by the Monticello FO are described in detail below.

##### **3.11.2.4.1 NON-COMMERCIAL SPECIAL RECREATION PERMITS (SRPs) AND SPECIAL EVENTS**

Special recreation permits are required for commercial and competitive recreational uses for groups and for OHV events involving 50 or more vehicles on BLM-administered public lands. SRPs may be required for recreational use on public lands by organized non-commercial groups of greater than one person, but permit issuance would be at the discretion of the FO Manager and based on site-specific conditions (personal communication between Brad Colin, Monticello FO, and David Harris, SWCA Environmental Consultants, June 22, 2007). Commercial outfitters are required to submit a schedule of use prior to the BLM issuing an SRP (BLM 2002b).

#### **3.11.2.4.2 COMMERCIAL AND NON-COMMERCIAL RIVER PERMITTING**

In addition to the permit stipulations stated above, additional stipulations apply to the San Juan River. In 2005, the BLM received 4,325 non-commercial permit applications for the San Juan River; of which 964 were approved. Due to the high and growing demand, the BLM has instituted a mandatory, assigned campsite system on the San Juan River at Slickhorn (sites A–E), Grand Gulch, Trimble, Oljato, and Steer Gulch campsites, which are the only campsites available at higher water levels. The BLM reserves dates at these nine campsites on a rotating basis for commercial use (BLM 2002b). Currently, 11 commercial permits have been issued for the San Juan River, and a moratorium on issuing additional commercial permits is in effect.

#### **3.11.2.4.3 FEE DEMONSTRATION, FEE COLLECTION, AND BUDGET FOR PROGRAMS**

Due to a lack of base budgetary support, the Monticello FO has come to rely on the Federal Lands Recreation Enhancement Act for needed funds. The Monticello FO collects fees for recreational use in several locations including the San Juan River, Cedar Mesa and fee collection sites at two campgrounds.

Services to the public are provided from these fee monies. These services include (but are not limited to) maintenance of campgrounds, boat ramps, and restroom facilities; staffing of the San Juan River Ranger Station and the Kane Gulch Ranger Station; and expenses related to the San Juan River and Cedar Mesa permit activities. Fees amounted to \$259,330 in 2005. Fee, receipts vary greatly depending on water levels in the San Juan River and the amounts of drinking water in the canyons available for backpackers. Fees from the river program support both the river program and the Cedar Mesa program. While the Cedar Mesa program does collect fees, they are not enough to cover the expenses incurred for the management of the area.

#### **3.11.2.5 RECREATION MANAGEMENT AREAS**

The BLM recreational management includes the designation two types of recreational management areas; Special Recreation Management Areas (SRMAs) and the Extensive Recreation Management Area (ERMA). SRMAs are areas with very specific recreational opportunities or needs that require intensive management. SRMAs typically receive more intensive use and require higher numbers of staff and/or facilities to manage. The ERMA encompasses all those areas within the Monticello PA that are not managed as SRMAs. Detailed descriptions of the SRMAs and the ERMA in the Monticello PA are given below. Within the Monticello PA, 3 areas have been designated as SRMAs, including the San Juan River, Grand Gulch (which encompasses Cedar Mesa), and Canyon Basins. The Colorado River lies within the ERMA, but is not designated as part of the ERMA.

Another management technique is the designation of ACECs. ACECs are designated areas in the FO area where special management attention is needed to: 1) protect and prevent irreparable damage to important historic, cultural, and scenic values, fish or wildlife resources, or other natural systems or processes; or 2) to protect human life and safety from natural hazards. While ACECs typically are not associated directly with recreational management, in many cases the protection of ACEC resource values provides certain types of recreational opportunities generally relating to cultural, historic, scenic, or wildlife resources.

### **3.11.2.5.1 SPECIAL RECREATION MANAGEMENT AREAS (SRMAs)**

#### **3.11.2.5.1.1 San Juan River SRMA**

The San Juan River SRMA (SJRMA) encompasses approximately 15,000 acres on the north side of the San Juan River, from Montezuma Creek downstream to the boundary of the Grand Gulch Plateau SRMA, west of the town of Mexican Hat, Utah. The south side of the San Juan River is under the jurisdiction and administration of the BIA and the Navajo Nation.

Boating use on the San Juan River is very popular. A total of 1220 trips were recorded for 2005 with 45,059 user days. 2004 use was 1015 trips with 37,632 user days. Use varies widely depending on water flows in the river. 2005 was a record high water year. This intensive use necessitated the initiation of a lottery system for obtaining permits to control the number of visitors on the river. Many more private users apply than obtain permits, and many more companies would like to have commercial permits on the San Juan River. Pending the completion of a San Juan River Management Plan, commercial use is currently capped by the number of operators and by the number of launch dates.

The majority of float trips occur from March through September, though river use is open year-round. Launch sites include Sand Island and the Mexican Hat Boat Ramp while other sites are also used occasionally. Take-out locations are the Sand Island Boat Ramp, the Mexican Hat Boat Ramp, and Clay Hills.

There is no current river management plan for the San Juan River. Natural resources issues identified by staff in the Monticello FO are described below:

- A San Juan River Management Plan is needed.
- Expansion of invasive, non-native species along the riparian corridor and popular camping areas.
- High recreational use is making the protection of threatened and endangered species more difficult. Increase in recreation, especially in riparian areas and canyons, is impacting special status species, making protection more difficult. These species include the Yellow-billed Cuckoo, the Southwestern Willow Flycatcher, the Gunnison Sage-grouse and the Mexican Spotted Owl (see Section 3.16, Special Status Species).
- Increased visitation, and access to more information, has escalated the amount of looting and degradation of cultural sites. OHV riders both create and follow trails that pass directly through cultural sites. Secondary impacts include increased scouring and erosion of cultural resource sites as a result of vegetation loss from OHV use and dispersed camping related to OHV use.
- Siltation on the lower half of the river has changed the boating experience and may cause potential closure in 10–15 years.
- Water development in the upper San Juan River basin has created lower flows to lower river segments; boaters, especially those with larger commercial boats, are having problems getting through and are canceling launches.

- Launch ramps at the Sand Island Campground and at Mexican Hat Boat Launch are prone to flood damage.
- Management Agreements with the Navajo Nation and Glen Canyon NRA should be written (as of February 2004 these are underway).
- The boundaries of the SRMA need to be changed due to the "accretion" of land at approximately River Mile (minus) -9 to River Mile approximately (minus) -5, south of the private parcels located at the town of Bluff.

The 2001 Utah Rivers Study completed by the Institute for Outdoor Recreation and Tourism asked visitors to identify problems along the Upper and Lower San Juan River. Table 3.21 shows results of this study. However, it should also be noted that 98% of boaters on the upper San Juan and 99% on the lower San Juan said they were satisfied with their river trip experience.

The most popular trip origin and destination on the San Juan River is from Sand Island to Mexican Hat, with more than double the trips as any other stretch of the river. The majority of trips originate from Sand Island Campground.

**Table 3.21. Issues Identified by Users on the San Juan River**

Upper San Juan River	Lower San Juan River	Both Sections
Destruction of historic resources	Hard finding unoccupied campsites	Litter along the river
Graffiti or other vandalism	Not enough campsites along river	Evidence of cattle
Lack of information about river	Cattle droppings at campsites	Graffiti/Vandalism
Lack of water at launches/ take-outs	Destruction of historic resources	Lack of water at launches
Vegetation and soil trampling at launches	Litter along river	
	Low flying aircraft	
	Lack of water at launches/take-outs	

Source: Blahna and Reiter 2001.

Developed sites within the San Juan SRMA include the Sand Island Campground with 24 sites, Sand Island Boat Launch, and Mexican Hat Boat Launch. The river take-out point at Clay Hills is on land administered by Glen Canyon NRA. There is little development at Clay Hills; a pit toilet, an unimproved dirt ramp, and a rough dirt access road.

### 3.11.2.5.1.2 Grand Gulch Plateau SRMA/Cedar Mesa

The Grand Gulch Plateau SRMA includes not only the Grand Gulch canyon system, but also Cedar Mesa and its canyon systems. The Cedar Mesa area of the Grand Gulch Plateau SRMA is an area of regional, national and international significance for recreation. It is located approximately 25 miles west of the town of Blanding, Utah and 10 miles north of the town of Mexican Hat, Utah. It is bordered on the north by the Manti-La Sal National Forest (NF), on the

east by Butler Wash, on the west by Scenic Highway Route 276, and on the south by Highway 163 and the Glen Canyon NRA.

The major attractions within Cedar Mesa are its cultural resources including: lithic scatters, petroglyph and pictograph panels, pit houses and pit structures, Pueblo kivas, granaries, and cliff dwellings. Currently Cedar Mesa is being managed under the Grand Gulch Plateau Cultural and Recreation Area Management Plan (BLM 1993c). Due to increasing demand, a backcountry permit allocation system was adopted in 1999 for Cedar Mesa hikers. Permits are required to hike the area and are obtained either at the Monticello FO or at the Kane Gulch Ranger Station on Cedar Mesa.

The Grand Gulch Plateau Cultural and Recreational Area Management Plan (BLM 1993c) established the following overall objectives for the Cedar Mesa area (including Grand Gulch):

- protect and preserve cultural resources;
- protect, preserve, and enhance the natural character, solitude, inspirational value and scenic quality;
- protect and preserve primitive and semiprimitive and nonmotorized recreation opportunities; and
- increase awareness, appreciation, and stewardship of cultural and natural resources through education and interpretation.

Recreation resource management decisions specific to the Grand Gulch Plateau SRMA include:

- The Grand Gulch Plateau area was identified as an area to be managed to preserve Recreation Opportunity Spectrum (ROS) primitive (P) class and protect ROS semiprimitive nonmotorized class (SPNM) areas (see Section 3.10.2.2 above for detailed ROS information).
- The following ROS classes were assigned within the Cultural and Recreation Management Area: primitive (P) class, semiprimitive nonmotorized (SPNM) class, semiprimitive motorized (SPM) class, and roaded natural (RN) class (See Map 35 for a depiction of current ROS areas within the FO PA).
- Five recreation sites were identified for development or improvement including: Kane Gulch Ranger Station Area, which was constructed in 2005 and 2006. Comb Wash Campground, which is funded for 2006; Arch Canyon Campground, Butler Wash Ruin, and Mule Canyon Ruin. All have been developed or being planned for development except for Arch Canyon (Arch Canyon will likely not be recommended for development in the current RMP revision).

The Kane Gulch Ranger Station, located at the main access point into Grand Gulch, is the primary administrative site for the management of the area. BLM employees and volunteers, who live and work there seasonally from mid-February to November, staff the ranger station. Several other buildings and a number of travel trailers are sited there. Developed recreation sites within Grand Gulch Plateau SRMA include: the Kane Gulch Ranger Station, Bullet Canyon Trailhead, Government Trailhead, Collins Springs Trailhead, Arch Canyon Ruin, Comb Wash Campsite, Fish and Owl Canyon Trailheads, Moon House Trailhead, and the Butler Wash Ruin and Mule Canyon Ruin Interpretive Sites.

### 3.11.2.5.1.3 Canyon Basins SRMA

Canyon Basins SRMA encompasses approximately 214,000 acres. It is surrounded by Canyonlands National Park (NP) and Glen Canyon NRA on the west, Manti-La Sal NF on the south, and Hart's Point on the east. Located within the SRMA boundaries are the following ACECs: Indian Creek, Lavender Canyon, Bridger Jack Mesa, Shay Canyon, Butler Wash, and Dark Canyon. Other well-known recreation areas within the SRMA include Beef Basin, Shay Mesa, Dark Canyon Plateau, and Salt Creek Mesa.

The Indian Creek Recreation Corridor is a recognized attraction for rock climbing, while also providing opportunities for camping, backpacking, motorized vehicle use, and archeological site viewing. The Access Fund, a climbing lobbying group, has a very strong commitment to this area and recently, with private industry support, is revising a brochure on Indian Creek. An environmental assessment (EA), funded by the Nature Conservancy was signed in October 2005 for the Indian Creek Recreation Corridor. A private group, the Friends of Indian Creek Inc. was established in 2006 to assist the BLM with the implementation of the Indian Creek Recreation Corridor EA.

The rapidly increasing popularity of the area has severely increased the impact of humans on the corridor environment, and has created a demand for additional visitor services and facilities. Issues and concerns arising from the area's increase in popularity include: an increase in size and use of dispersed camping areas; management of human waste; preventing human-livestock conflicts; lack of adequate and safe parking; and protection of cultural sites within the immediate climbing area.

Existing facilities within the Canyon Basins SRMA include: Newspaper Rock Interpretive Site, Indian Creek (upstream from the Falls) Campsite (3 sites), and Hamburger Rock Campground (8 sites).

Dark Canyon ACEC is located in Canyon Basin SRMA. The Dark Canyon ACEC encompasses approximately 62,040 acres and has the same boundaries as the Dark Canyon Primitive Area. It includes Dark Canyon with its side canyons of Lost, Lean-To, Youngs, and Black Steer, and then Bowdie Canyon, Gypsum Canyon, and Fable Valley. This area was designated as a primitive area in December 1970 to protect its scenic, recreational, and other values and became an instant Wilderness Study Area in 1976. The lower portions of Dark Canyon (3 miles), Bowdie Canyon (2 miles), and Gypsum Canyon (3 miles) are within the Glen Canyon NRA and are areas proposed for wilderness designation. The upper portion of Dark Canyon is within the Manti-La Sal NF and was designated in 1984 as the Dark Canyon Wilderness Area, encompassing about 50,000 acres (BLM 1986a).

Beef Basin is located within the Canyon Basin SRMA. This area is popular with those seeking a backcountry driving experience, primitive camping and an opportunity to see ruins.

Since the implementation of mandatory permit system on Cedar Mesa, there is increasing private recreational use of Dark Canyon as well as increasing demand for permits from commercial operators. If this trend continues, a permit system for Dark Canyon will likely be necessary. Commercial interest and the use of Dark Canyon is originating from FS, NPS, and BLM public

lands. There is little current on-the-ground management by the BLM within the Dark Canyon ACEC.

### **3.11.2.5.2 EXTENSIVE RECREATION MANAGEMENT AREA**

#### **3.11.2.5.2.1 Colorado River**

The Colorado River lies within the Extensive Recreation Management Area (ERMA), but is not designated as part of the ERMA. The Monticello FO manages the portion of the Colorado River from the northernmost PA boundary at the Colorado River south to Canyonlands NP (approximately river mile 50 to river mile 31).

Guidance supports dispersed recreation use throughout the San Juan PA, with permits required for commercial and private use in special areas where protection of resource values is needed. There is very little unpermitted day use of the river in Canyonlands NP because of the distance from put-ins and take-outs. Commercial use is expected to increase outside of the park (personal communication between Dave Wood, Canyonlands NP, and David Harris, SWCA Environmental Consultants, on March 30, 2004). A joint agreement between the BLM Monticello FO and Canyonlands NP to manage the Colorado River segment needs to be completed.

#### **3.11.2.5.2.2 Hole in the Rock Trail**

This trail is both an historic feature as well as a recreational opportunity. The trail was established in 1879 as a route between the settlements of Escalante and Bluff. Major use of the trail is by four-wheel drive vehicles for scenic driving. The trail segment within the Monticello PA is approximately 115 miles long.

The trail is open to OHV use. Sections of this trail lead into Glen Canyon NRA, and within the Glen Canyon NRA, vehicle use is open to licensed vehicles, but not unlicensed OHVs. There is increasing use and interest for both private and commercial use of the trail. These uses include cultural tours, OHV tours, bicycle tours, canyoneering, backpacking, and special uses such as OHV Safaris and adventure races. Many local residents have ancestors that traveled on this trail. These residents want to visit the area, and they have established The Hole in the Rock Foundation to protect their interests and work with the BLM on issues concerning this trail.

#### **3.11.2.5.2.3 Old Spanish National Historic Trail**

Approximately 20 miles of the Old Spanish National Historic Trail (a designated National Historic Trail running from New Mexico to California), lies within the Monticello PA, and except where crossing private land, the trail corridor is open for vehicle use. There are no BLM-administered facilities along the trail segment, and the BLM is currently not actively managing the trail. The BLM is currently cooperating with the NPS to complete a plan to manage the entire trail.

#### **3.11.2.5.2.4 Valley of the Gods**

The Valley of the Gods is located in the southern portion of the Monticello PA. Recreational activities in Valley of the Gods include sightseeing, primitive camping, hiking, and biking. The annual one-day Bluff Balloon Festival is held there in January. The area is well known for its scenic quality, with outstanding views of Cedar Mesa sandstone and other unique geologic formations. County Road 242 (dirt, single-lane road) takes a 17-mile circuitous route through the valley, passing many features of interest.

#### **3.11.2.5.2.5 Three Kiva Pueblo**

Three Kiva is a pueblo site with a reconstructed kiva. Kivas are an important Southwestern architectural form. "Kiva" is a Hopi word used to refer to specialized round and rectangular rooms in Pueblos. Modern kivas are used for men's gathering and ceremonial purposes. Archeologists believe that ancient kivas were used for similar purposes. The site, near Montezuma Creek, has an interpretive sign as well as a ladder allowing visitors an opportunity to view a pueblo kiva.

#### **3.11.2.5.2.6 Trail of the Ancients National Scenic Byway.**

The Trail of the Ancients National Scenic Byway is a scenic drive providing an opportunity for viewing prehistoric and modern Native American cultures and remarkable desert scenery. This scenic byway runs through a portion of the Grand Gulch Plateau SRMA.

### **3.11.3 TRENDS IN OUTDOOR RECREATION ACTIVITIES**

According to staff in the Monticello FO, the following trends in recreation have been observed in the resource area:

- increased OHV use;
- increased commercial activity requests;
- increased Special Event requests;
- increased rock climbing;
- increased visitation of recreation and cultural sites due to increase in distribution of information via the Internet;
- increased demand for private and commercial river use;
- the displacement of campers out of areas with mandatory permit systems;
- increased overflow camping use by visitors that cannot find room in NPS campgrounds;
- increased visitor expectation that the BLM's information sources are comparable to that available on the Internet; and
- displacement of private visitors and commercial operators from the NPS lands around Moab; these visitors are moving into the Monticello area (Reiter and Blahna 1998a, 1998b).

The Recreation Management Information System (RMIS) documents visitor days for various activities throughout the FO area. Although these numbers are not completely accurate, they do reflect the proportionate use as well as the increase in use of the resource for recreation activities. The table below shows recreation use for the Fiscal years 2001, 2002 and 2003.

### 3.11.4 ISSUES AND CONCERNS

#### 3.11.4.1 INCREASED RECREATION USE

SRMA boundaries need to be reevaluated based on increased visitor use, recreation opportunities and the resource involved. The current RMP does not identify the kinds of levels of land use that could sustain recreational values. There are no accurate numbers on private recreational use other than the permitted uses on the San Juan River and Cedar Mesa. At current staff levels, it is becoming difficult to keep up with SRP and NEPA workloads.

**Table 3.22. Visitor Days 2001–2005**

Activity	2002	2003	2004	2005	2002–2005 Increase or Decrease
Camping	36,103	51,266	85,759	84,560	48,457
Boating (nonmotorized)	19,308	21,696	28,094	32,700	13,392
Hiking	12,169	15,244	21,652	20,832	8,663
Backpacking	8,817	11,389	14,986	10,391	1,574
Viewing cultural sites	4,098	4,321	8,132	7,516	3,418
OHV use	1,833	6,610	11,292	12,060	10,227
Nonmotorized events and activities	1,386	157	216	201	-1,185
Hunting	1,119	3,432	2,860	3,930	2,811
Driving for pleasure	663	2,069	1,733	2,800	2,137
Mountain biking	662	1,816	1,558	2,297	1,635
Pack trips	493	813	1,107	2,396	1,903

Source: BLM recreation records located in Monticello FO.

#### 3.11.4.2 RESOURCE CONFLICTS/IMPACTS

Various recreational activities create impacts to resources including riparian areas, vegetation, wildlife, vegetation, soils, grazing, oil and gas, and cultural resources. Resource conflicts occur when two uses compete for the same resource, such as recreational use in wildlife habitat. Specific areas where resource conflicts are occurring include:

- Recreation vs. Natural Resources—specifically at Indian Creek where camping impacts the riparian area, traffic impacts safety, and high use impacts human health and safety.
- Recreation vs. Cultural Resources—The Cedar Mesa area of Grand Gulch has a reputation for being a premier place to hike into Indian ruins and remote canyons. Although managed

by permit, information available on the Internet and in guidebooks is leading hikers to sensitive cultural sites. The issue is how to protect cultural sites and still allow for visitation and education at Newspaper Rock, Butler Wash, Comb Wash, Cedar Mesa, and Montezuma Creek. This issue is particularly intense along the San Juan River and on Cedar Mesa.

#### **3.11.4.3 USER CONFLICTS**

As recreational use has increased throughout the Monticello PA, users have moved into areas historically used by other resource users, such as ranchers, and the oil and gas industry. Conflicts have developed among these user groups as long-term users resent encroachment of recreationists on the public lands. In turn, some recreation users see their use of the public land as the highest and best use, and feel that the established users have no place on that land. Another source of tension is among various recreation user groups.

When recreational use reaches a certain threshold, user groups start to resent the multi-use nature of public lands. For example, some hikers resent mountain bikers and motorized users on shared trails, while mountain bikers may seek some trails free from motorized use. Conflicts are known to exist between:

- recreation and grazing users;
- nonmotorized recreation and motorized recreation users;
- rock-climbing and grazing (specifically in Indian Creek) users;
- commercial vs. private users (related to San Juan River users as well as backpackers throughout the resource area, especially in Dark Canyon); and
- river runners and OHV users.

#### **3.11.4.4 PUBLIC HEALTH AND SAFETY**

Human waste disposal is becoming an issue in the more popular slot canyons and dispersed camping areas, such as Indian Creek. Climbers and hikers, the primary users of this area, have written letters to the BLM asking the agency to address this problem. The availability of facilities is directly related to public health. Inadequate numbers of organized campgrounds and restroom facilities contribute to unhealthy levels of human waste in some areas, posing a health risk to visitors. Funding for maintenance of existing and needed facilities is also a serious issue.

Flooding is an issue for recreational use in the SJRA. Flash floods are a real and seasonal danger in narrow canyons and canyon crossings. Recent flooding in specific areas provides an example of the problem: portions of Newspaper Rock and Sand Island Campground were recently inundated by floodwaters. Sand Island campground is particularly prone to flood damage. Trails may also become inundated and nonfunctional. The BLM currently lacks the funding to address and rectify the damage that occurs from flooding.

### **3.11.4.5 OFF-HIGHWAY VEHICLES (OHVs)**

#### **3.11.4.5.1 OHV USE**

The increase in the use of OHVs has created several issues for the Monticello FO. First, the speed of OHVs allows easier access than foot travel to remote parts of the area, making management of this activity and the area utilized more difficult, while also increasing the potential range of impacts. Secondly, the popularity of this activity continues to grow, and the addition of special events puts additional strain on resources. Planning for areas in which OHVs can be used continues to receive national and local attention. Specific issues identified by the BLM include:

- Although the current RMP identifies all public lands as open, limited, or closed, the Plan does not give specific management guidance within these designations.
- The OHV designations outlined in the SJRMP do not currently address the amount of recreational use now occurring or the potential of resource damage associated with this use.
- In the current RMP none of the OHV designations have been implemented. Maps depicting existing RMP decisions are out of print and not available to the public.
- Increased use creates the need for additional management and planning, which is not funded.

Part of this RMP revision process is to evaluate and update the OHV designations and develop a current map of the Monticello PA in order to ensure that the FO is in compliance with Executive Order 11644 as amended by Executive Order 11989 and also to ensure that the FO is following the National Management Strategy for Motorized Off-Highway Vehicle Use on Public Lands, January 2001.

#### **3.11.4.5.2 OHV LEGAL ISSUES**

Monticello FO, like much of Utah, continually deals with OHV-associated conflicts, including those that have legal implications. These conflicts have ranged from minor disagreements between resources users, to unauthorized opening of an old trail into a WSA. The BLM has struggled with OHV management in the Monticello FO due to the lack of a completed travel plan that includes designated areas for OHV use and a completed roads and trails system. Without a final travel plan, the BLM cannot update travel maps or undertake to educate users on OHV restrictions to protect natural resources, particularly cultural resources, which are found in abundance on public lands in the Monticello FO.

## **3.12 RIPARIAN RESOURCES**

Riparian areas and wetlands are some of the most diverse and productive ecosystems in Utah, but on the landscape level they typically compose very little of the total land area. Riparian and wetland ecological systems comprise less than 1% of the 22 million acres of public lands administered by the BLM in Utah. However the functions and habitat value provided by these areas are essential to both humans and wildlife. For humans, these values are recreational, scenic, livestock production, and hunting. Riparian areas are also typically tied to cultural and historical values. Additionally, the lifecycles and migration routes of many mammals, birds, amphibians,

and fishes rely partially or wholly on riparian habitat. Riparian and wetland resources are among the first landscape features to show impacts from management activities and provide an indicator of overall watershed condition.

Riparian and wetland areas are vegetative or physical ecosystems that develop in association with surface or subsurface water (Leonard et al. 1997). Benefits of riparian/wetland ecosystems include:

- maintaining water quantity and quality;
- enhancing soil stability and reducing sediment loads;
- reducing destructive energies associated with flood events;
- providing for diverse plant and wildlife ecosystems, including special status species;
- economic value derived from sustainable uses (open space, hunting, livestock grazing and commercial recreation);
- migration corridors for wildlife; and
- thermal/shade protection for both humans and wildlife, which is especially important within the arid southwest.

### **3.12.1 RESOURCE OVERVIEW**

The BLM administers approximately 20,912 acres (1.6% of lands within the Monticello FO) that are riparian and wetland resources. Linear riparian distance in the Monticello FO totals 1,078 miles. Wetlands in the Monticello FO are primarily concentrated along these riparian zones. Some isolated springs do occur, and while these make up a very small percentage of wetland resources, they are critical to both wildlife and livestock.

Within most riparian/wetland systems in the arid southwest, the potential of a riparian/wetland ecosystem is strongly dependent upon the availability of water. The degree, timing and source of water availability, among other physical factors, contribute to a stream falling into one of 3 categories:

- **Perennial**—A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.
- **Intermittent**—A stream that flows only at certain times of the year when it receives water from springs or some surface source such as melting snow in mountainous areas.
- **Ephemeral**—A stream that flows only in direct response to precipitation, and whose channel is above the water table at all times.

Existing riparian vegetation communities in the Monticello FO were catalogued in 1990 using aerial photographic interpretation with some ground-truthing. Identified species reflected the dominant vegetation in the community during the cataloguing. Existing riparian vegetation cover types and percent composition of riparian area during this time period are included below in Table 3.23.

**Table 3.23. Riparian Community Acreages, 1990 Inventory, Monticello FO**

Riparian Community	Percent Composition
Cottonwood	65.9%
Willow	<0.1%
Tamarisk*	30.2%
Grasses	0.3%
Oak	3.6%

\*This is an invasive, non-native species.

### 3.12.2 RIPARIAN/WETLAND STUDIES

The BLM has developed Riparian Proper Functioning Condition (PFC) methodology for use by interdisciplinary teams of natural resources professionals (BLM 1993d). This methodology assesses riparian areas relative to what would be expected under natural conditions and limiting factors, i.e., political, social and economic constraints. Levels of functionality include functional, functional-at risk, nonfunctional and unknown. A preliminary summary of data on riparian functioning condition was prepared by Paul Curtis, Rangeland Conservationist, Monticello FO (Table 3.24). These data were collected by private contract in 1994 and by BLM resource specialists from 1994 to present. Approximately 50% or less of the actual stream mileage was traversed during the collection of this data. Functioning condition is divided into 5 classes, which are defined below, with corresponding miles of riparian habitat in each class for the Monticello PA (BLM 1998b):

- **PFC:** Currently 639 miles (59%) of riparian/wetland areas in the Monticello FO are in PFC when adequate vegetation, landform, or woody debris is present to:
  - dissipate high-energy water flow;
  - filter sediment, capture bedload, and aid floodplain development;
  - improve floodwater retention and groundwater recharge;
  - develop root masses that stabilize streambanks;
  - develop diverse fluvial geomorphology (pool and channel complexes) to provide habitat for wildlife; and
  - support greater biodiversity.
- **Functioning at Risk, trend not apparent (FAR):** Currently 240 miles (22%) of riparian/wetland habitat are in functional condition, but at least one soil, water, or vegetation attribute makes them susceptible to degradation following high flow events. The trend in these systems is not apparent. Management practices that may make them At Risk are commonly livestock grazing, presence of roads, OHV activities, and recreational activities and development.
- **Functioning at Risk, upward trend (FAR>):** Currently 43 miles (4%) of riparian/wetland habitat are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation following high flow events. However, the limiting attribute is improving, causing the system to trend upward. Some degradation could be natural.

Management practices that may make them At Risk are commonly livestock grazing, presence of roads, OHV activities, and recreational activities and development.

- **Functioning at Risk, downward trend (FAR<):** Currently 149 miles (14%) of riparian/wetland habitat are in functional condition, but an existing soil, water, or vegetation attribute makes them susceptible to degradation following high flow events. The limiting attribute is not improving, causing the system to trend downward. Some could be natural degradation. Management practices that may make them At Risk are commonly livestock grazing, presence of roads, OHV activities, and recreational activities and development.
- **Nonfunctioning (NF):** Currently 7 miles (0.6%) of riparian/wetland habitat are clearly not providing adequate vegetation, landform, or large wood debris to dissipate stream energy associated with high flows, and thus are not reducing erosion, improving water quality, etc. Some degradation could be natural. Management practices that may make them At Risk are commonly livestock grazing, presence of roads, OHV activities, and recreational activities and development.

**Table 3.24. Riparian Functioning Condition, Monticello PA (BLM Lands Only)**

Drainage	Acres	Miles	Proper Functioning Condition		Functioning at Risk, Trend Not Apparent		Functioning at Risk, Trend Improving		Functioning at Risk, Trend Declining		Not Functioning	
			Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles
Alkali Canyon	151.60	6.59		0	100%	6.59		0		0		0
Arch Canyon	222.53	8.22	100%	8.22		0		0		0		0
Armstrong	8.40	0.50	100%	0.50		0		0		0		0
Beef Basin	169.28	7.27	11%	0.80		0		0	89%	6.47		0
Big Canyon North	0	0	dry	0		0		0		0		0
Big Canyon South	189.54	8.57		0	100%	8.57		0		0		0
Big Indian	0	0	dry	0		0		0		0		0
Black Steer	0	0	dry	0		0		0		0		0
Blue Cyn-Red	0	0	dry	0		0		0		0		0
Bogus	0	0	dry	0		0		0		0		0
Bowdie	202.22	10.86	100%	10.86		0		0		0		0
Bradford	10.69	0.89	100%	0.89		0		0		0		0
Bridge Canyon	45.30	2.15	100%	2.15		0		0		0		0
Brushy Basin	137.10	7.53	100%	7.53		0		0		0		0
Bullet	47.68	3.46	100%	3.46		0		0		0		0
Butler	929.96	42.11	30%	12.63		0	40%	16.85	30%	12.63		0
Butler WashNorth	303.17	19.07		0	35%	6.67	65%	12.40		0		0
Castle	415.35	18.89	30%	5.67	18%	3.40		0	34%	6.41	18%	3.41
Cedar Cyn-Mancos	0	0	dry	0		0		0		0		0
Cheesebox	162.16	8.95	100%	8.95		0		0		0		0
Coal Bed	284.00	18.93	76%	14.39	24%	4.54		0		0		0
Colorado	615.38	18.00	100%	18.00		0		0		0		0
Comb Wash	2201.57	36.07	7%	2.52	93%	33.55		0		0		0
Corral	0	0	dry	0		0		0		0		0
Cow Tank	0	0	dry	0		0		0		0		0
Cross Canyon	389.66	8.16	55%	4.49	45%	3.67		0		0		0
Dark Canyon	69.27	5.23	90%	4.70	10%	0.53		0		0		0
Davis	214.62	6.49	49%	3.18	51%	3.31		0		0		0

**Table 3.24. Riparian Functioning Condition, Monticello PA (BLM Lands Only)**

Drainage	Acres	Miles	Proper Functioning Condition		Functioning at Risk, Trend Not Apparent		Functioning at Risk, Trend Improving		Functioning at Risk, Trend Declining		Not Functioning	
			Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles
Deer Canyon	36.59	2.36	100%	2.36		0		0		0		0
Devils Canyon	164.82	6.40	100%	6.40		0		0		0		0
Dodge Canyon	20.43	1.00	100%	1.00		0		0		0		0
Dog Tanks	42.29	2.88	100%	2.88		0		0		0		0
Dripping and Step	53.83	3.15	100%	3.15		0		0		0		0
Dry Valley	0	0	dry	0		0		0		0		0
Dry Wash	314.07	15.80		0	40%	6.32		0	60%	9.48		0
East Canyon	160.64	12.40		0	50%	6.20	50%	6.20		0		0
Fable	318.72	11.43	80%	9.14	20%	2.29		0		0		0
Fish and Owl Creek	973.72	49.42	90%	44.48	10%	4.94		0		0		0
Forgotten	32.79	2.38	100%	2.38		0		0		0		0
Fortknocker	0	0	dry	0		0		0		0		0
Fry Canyon	62.27	2.02		0	100%	2.02		0		0		0
Grand Gulch	2238.39	101.50	100%	101.5		0		0		0		0
Gravel	0	0	dry	0		0		0		0		0
Gypsum	93.09	9.30	100%	9.30		0		0		0		0
Hart Draw	604.98	26.42	38%	10.04	50%	13.21		0	12%	3.17		0
Hideout	0	0	dry	0		0	0	0	0	0		0
Horse Canyon	69.60	3.81		0	100%	3.81	0	0	0	0		0
Horsehead	60.62	3.00	100%	3.00		0	0	0	0	0		0
Indian Creek	1747.18	64.06	37%	23.70		0		0	63%	40.36		0
Johns Canyon	290.34	13.52	100%	13.52		0		0		0		0
Johnson Creek	93.75	3.98	50%	1.98		0	50%	2.00		0		0
Kane Gulch	48.32	2.60	100%	2.60		0		0		0		0
Knowles	38.11	2.60	100%	2.60		0		0		0		0
Lake Canyon	183.49	9.57	22%	2.11		0		0	45%	4.30	33%	3.16
Lavender	41.06	1.54		0	100%	1.54		0		0		0

**Table 3.24. Riparian Functioning Condition, Monticello PA (BLM Lands Only)**

Drainage	Acres	Miles	Proper Functioning Condition		Functioning at Risk, Trend Not Apparent		Functioning at Risk, Trend Improving		Functioning at Risk, Trend Declining		Not Functioning	
			Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles
Lean-To	49.11	3.13	100%	3.13		0		0		0		0
Lime Creek	707.80	40.00	50%	20.00	50%	20.00		0		0		0
Lockhart	55.60	4.00	40%	1.6	60%	2.4		0		0		0
Long Canyon	0	0	dry	0		0		0		0		0
Lost Canyon	0	0	dry	0		0		0		0		0
Mancos	0	0	dry	0		0		0		0		0
McCracken	194.90	4.65		0		0		0	100%	4.65		0
Mikes	113.70	7.70		0	100%	7.70		0		0		0
Moki Canyon	424.97	21.90	50%	10.95		0		0	50%	10.95		0
Montezuma	1101.24	30.51	12%	3.66	18%	5.49		0	70%	21.36		0
Monument	406.59	15.54		0	100%	15.54		0		0		0
Mule Canyon	268.44	12.80	65%	8.32	35%	4.48		0		0		0
Navajo-Grey Mesa	12.98	0.70	100%	0.70		0		0		0		0
North Cottonwood	391.86	11.56	51%	5.90		0	49%	5.66		0		0
North Creek	4.31	1.73	100%	1.73		0		0		0		0
North Gulch	60.85	4.00	100%	4.00		0		0		0		0
Pearson Canyon	14.25	1.00	100%	1.00		0		0		0		0
Peters Canyon	16.94	1.22	100%	1.22		0		0		0		0
Point Lookout	168.72	10.08	100%	10.08		0		0		0		0
Recapture	1251.01	41.42	25%	8.00	75%	33.42		0		0		0
Red Canyon	0	0	dry	0		0		0		0		0
Road Canyon	726.19	41.21	29%	11.95		0		0	71%	29.26		0
Ruin	107.17	4.46	55%	2.45	45%	2.01		0		0		0
Salt Creek	0	0	dry	0		0		0		0		0
San Juan	4075.16	56.13	50%	28.07	50%	28.06		0		0		0
Seep Creek	2.31	0.21	100%	0.21		0		0		0		0
Slick Rock Grey Mesa	3.99	0.29	100%	0.29		0		0		0		0

**Table 3.24. Riparian Functioning Condition, Monticello PA (BLM Lands Only)**

Drainage	Acres	Miles	Proper Functioning Condition		Functioning at Risk, Trend Not Apparent		Functioning at Risk, Trend Improving		Functioning at Risk, Trend Declining		Not Functioning	
			Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles	Percent	Miles
Slickhorn	392.44	22.19	100%	22.19		0		0		0		0
South Canyon	3.02	0.27	50%	0.13	50%	0.14		0		0		0
South Cottonwood	2424.95	77.44	100%	77.44		0		0		0		0
Spring Creek	96.30	5.26		0	100%	5.26		0		0		0
Squaw Canyon	146.67	7.69	50%	3.84	50%	3.85		0		0		0
Steer Gulch	0	0	dry	0		0		0		0		0
Steer Pasture	146.28	8.00	100%	8.00		0		0		0		0
Ute	48.15	3.37	100%	3.37		0		0		0		0
Westwater	131.30	5.37	100%	5.37		0		0		0		0
White Canyon	893.02	40.22	100%	40.22		0		0		0		0
Youngs	95.12	4.45	100%	4.45		0		0		0		0
<b>Total</b>	<b>28993.9</b>	<b>1077.6</b>	<b>59.3%</b>	<b>639.35</b>	<b>22.2%</b>	<b>239.51</b>	<b>4.0%</b>	<b>43.11</b>	<b>13.8%</b>	<b>149.04</b>	<b>0.6%</b>	<b>6.57%</b>

Riparian/wetland exclosures have been constructed within 15 sites: Comb Wash (1), Indian Creek (3), Montezuma Creek (2), Nancy Patterson (1), Monument Canyon (1), Horsehead (1), and Cross Canyon (6), to either determine ecological site potentials or protect/improve natural functions. Riparian pastures have been established within the Montezuma Canyon allotment to provide special protection to sensitive riparian/wetland ecosystems. Grand Gulch and major portions of Fish and Owl, Mule, Road canyons, and Arch Canyon receive no livestock grazing.

### **3.12.3 RIPARIAN/WETLAND RESTORATION**

Restoration of riparian/wetland ecosystems can involve efforts to manually, mechanically, chemically, or biologically alter or restore riparian/wetland resources or conditions for the benefit of the riparian/wetland ecosystem.

Invasive, non-native species (namely tamarisk, Russian olive, and Russian knapweed) are now common within most riparian/wetland ecosystems along major river ways in the Monticello PA. Some of the common riparian native species are Fremont Cottonwood, coyote willow, rushes, and sedges. Possibly the most devastating aspect of invasive, non-native species is the cumulative alteration to an unhealthy riparian ecosystem. Effects of invasive, non-native species include the following:

- invasive plants often dewater riparian sites with deeper tap roots to out-compete natives for availability of water in arid environments;
- tamarisk secretes salt and increase soil and water salinity, resulting in reduced seed establishment of native species, and reduced downstream water quality. Additionally, tamarisk has deeper roots than native willows, and it will out-compete those for water;
- invasive plants compete for sun and space along the narrow riparian habitats;
- invasive plants have large numbers of seeds and long seed establishment periods (very prolific in comparison to native species);
- invasive plants provide poor habitat, with subsequent reductions in biodiversity (significant decreases in numbers and types of associated biotic species including birds, bats, insects, amphibians, etc.);
- invasive plants promote entrenched systems with highly destructive flooding energies that remain un-dissipated within deep channels, resulting in high bank loss, sedimentation, and salinity; and
- invasive plants are typically less palatable to livestock and wildlife (e.g., willow versus tamarisk), putting native species at a competitive disadvantage, and often resulting in a reduced presence within the riparian community.

### **3.12.4 RESOURCE DEMAND AND FORECAST**

Riparian/wetland ecosystems are strong attractors for both animal and human activities, especially in the arid southwest where summer temperatures often exceed 100 °F. Demand for diverse riparian/wetland ecosystems is high and currently exceeding the average capacity of these systems in the PA, with resulting decreases in sustainability, and proper functioning

condition. The recreational demand within riparian/wetland is highest during critical spring growing seasons when seedling establishment and stand recruitment occurs, but recreation peaks again during fall seasons after extreme summer temperatures decline. Demands for water resources with potential direct and indirect impacts to associated riparian/wetlands would likely increase in response to current and prolonged droughts. With decreasing quantity and quality of riparian/wetlands due to growing popularity, the demand for diverse wildlife habitat and refuge becomes even more critical as more species and habitats become sensitive or endangered.

#### **3.12.4.1 RECREATION**

The majority of developed BLM recreational campgrounds, trails and facilities are located in association with riparian/wetland ecosystems. Native cottonwoods are some of the most susceptible species with regard to functioning condition and long-term sustainability, but are also the most desirable native and diverse riparian/wetland ecosystem within Monticello PA. Recreational developments within riparian/wetlands increase competition for natural habitats, or eliminate habitats critical to riparian-dependent wildlife species.

Recreational demand for hiking, horse trails, and commercial recreation permits often concentrate uses along streams due to the available water source, thermal protection, and scenery. However, unconsolidated alluvial soils often located within riparian canyons have shown to be extremely susceptible to erosion and degradation by such uses.

#### **3.12.4.2 GRAZING**

Livestock production continues to be a source of income for some San Juan County residents, and these operations rely on public lands to provide forage for their livestock. Overgrazing can impact riparian resources through the introduction of invasive species, stream bank degradation, reduction in plant recruitment, and decrease in water quality.

#### **3.12.4.3 INVASIVE SPECIES**

Tamarisk (*Tamarix ramosissima*), Russian olive (*Elaeagnus angustifolia*), and cheatgrass (*Bromus tectorum*) have invaded waterways throughout the Monticello PA, drastically changing the composition of riparian vegetation communities. Cheatgrass is a highly competitive, non-native, and invasive grass that has displaced many native plant species across a sizeable portion of rangelands, and has invaded riparian areas and waterways. This grass provides little resource value because of its annual growth form, shallow root system, and protruding awns, and its flammability increases the risks of wildland fire. Populations of Russian knapweed (*Acroptilon repens*) and camelthorn (*Alhagi maurorum Medik.*) have also reached high levels in many river corridors. Strategies used to control tamarisk and other riparian invasive species appear in Section 3.18, Vegetation. The management and maintenance of native diverse ecosystems has become a larger issue in recent years. Vegetative conversions to invasive, non-native species from native species have occurred within riparian/wetlands with influence of management practices.

### 3.13 SOCIOECONOMICS

The socioeconomic context of this RMP/EIS refers to the social, cultural and economic settings of communities impacted by the implementation of the BLM's management actions. The following section provides a summary of the PA's social history and current demographic and economic trend information as well as a description of the key industries that are may be affected by management action implementation.

#### 3.13.1 COUNTY OVERVIEW

San Juan County is situated in southeastern Utah, bordering Colorado to the east and Arizona to the west. It is one of the most remote counties in the state. Located far from major transportation corridors and industrial centers, the small towns and communities within the county continue to maintain their rural character. The county comprises over 5 million acres and has approximately two people per square mile; it is one of the state's most sparsely populated counties. The federal government administers more than 3,000,000 acres (61%) of public lands within the county. The BLM manages the majority of the county's federal land, with jurisdiction over more than two million acres (41.5%). Of the over two million acres of BLM lands, 1,785,127 acres are managed by the Monticello FO. The remaining 290,473 acres located in San Juan County are managed by the Moab FO. Native Americans have jurisdiction over 1.2 million acres (26%) of land in San Juan County. Only 8.2% of the land is privately owned. Table 3.25 shows the land composition of San Juan County.

**Table 3.25. Land Jurisdiction in San Juan County**

<b>Administrative Agency</b>	<b>Total Acres</b>	<b>Percent of County</b>
Federal lands	3,053,847	61.0
BLM lands	2,075,600	41.5
U.S. Forest Service	403,875	8.1
National parks	266,117	5.3
National Recreation Areas	262,244	5.2
USFS Wilderness Area	46,011	0.9
State lands	263,287	5.3
Private*	411,077	8.2
Native American	1,277,637	25.5
<b>Total acres within the county</b>	<b>5,005,848</b>	<b>100.0</b>

\*May include some local government land.

Source: Utah Division of Travel Development 2004.

Unique to Utah, more than half of the population of San Juan County is composed of Native Americans. Where data are available, the Navajo Nation is discussed as a unique subset of the greater population.

The isolative and rural character of San Juan County is both a "blessing and a curse" to the county's residents, according to the San Juan County Community Development Department. The natural landscape provides outstanding opportunities for solitude and recreation. The County contains colorful sandstone canyons and deserts, timbered mountains, ancient Indian ruins, the Colorado, San Juan, and Green rivers, Lake Powell, National and State parks and monuments. On the other hand, the lack of economic diversity can be problematic for County residents. The current job market does not offer many opportunities and the wages earned rank among the lowest in the state (San Juan County 2002b).

### **3.13.2 HISTORICAL SOCIAL CONTEXT**

The Monticello PA is an area rich in cultural and natural history. Past settlements and uses in the PA by a variety of peoples have been as important as the ecological processes that have created and shaped the place that the BLM manages today. A brief review of the social and cultural history in the area will provide background information on the present-day social setting in the PA.

Archaeological evidence suggests that San Juan County and the larger Four Corners Area was inhabited by Native Americans called Ancestral Pueblo People (Anasazi) between the years 1 and 1300 A.D., with some evidence dating back as early as 1500 B.C. (BLM 2005i). The Ancestral Pueblo People successfully farmed the Four Corners Area for over a thousand years but evidence suggests they left the region by 1300 A.D. Other Native Americans occupied the San Juan County area after the Ancestral Pueblo People, including the Utes, Paiute and Navajo. Remains of Native American dwellings and rock art throughout the Monticello PA provide glimpses into the history of the cultures that once inhabited the region.

Spanish explorers entered into the San Juan County area as early as 1765 looking for a route from Santa Fe, New Mexico to California. Traders and trappers later used the trail established by the explorers as a route to the valley of the Great Salt Lake. This trail, now known as the Old Spanish National Historic Trail, was the first known commercial route in Utah. The Trail entered San Juan County at the Utah/Colorado border, along the current US Highway 491 and went northward along the present day US Highway 191, crossing the Colorado River just outside of Moab, Utah (San Juan County 2002b).

In the late 1800s, cowboys, outlaws, gold-seekers, ranchers and farmers began arriving to the area. As the Anglo settlers began to homestead the San Juan County area and other lands throughout the west, conflicts between Native Americans and the new settlers arose. The conflicts resulted in the creation of reservations for the Ute and Navajo people. The Navajo Reservation was established in 1868 and encompasses the southern portion of San Juan County. The Ute Reservation at White Mesa was established in 1920 (San Juan County 2002b).

### **3.13.3 RECENT REGIONAL HISTORY**

San Juan County's twentieth century is illustrative of a boom-and-bust economy. As people began to homestead the west at the recommendation of the federal government, many individuals were hopeful they could farm and ranch in the arid region. The grazing and farming took a toll

on the landscape, making continued practices difficult. Agricultural success ebbed and flowed throughout the twentieth century and by the end of the century self-sufficient agricultural practices proved challenging. The 1990 census indicates that fewer than 50 people in San Juan County claim agriculture is the sole support for their livelihood (McPherson 1995).

Mining in San Juan County has also seen several booms and busts. Beginning in the late nineteenth century people seeking gold and silver entered the area, but the inability to "strike it rich" in the area prompted their departure. Copper became the next sought-after mineral and in 1918 the first copper mill began operating. Oil drilling operations were also occurring around this time, but did not prove fruitful for many operators. Mining operations slowed significantly by the mid-1920s and it was not until demand for uranium in World War II revived the mining industry. The Monticello Mill and the Rio Algom Mill were established in the county to process uranium and vanadium (McPherson 1995). By the early 1980s, demand for uranium decreased and both of the mills had closed.

### **3.13.4 CURRENT DAY SOCIAL AND ECONOMIC CONTEXT**

#### **3.13.4.1 SOCIAL SETTING**

Today, San Juan County is a collection of rural communities characterized by pastoral landscapes, open space, and small town qualities. The area's historical link to agricultural endeavors has shaped the communities' land-based values. Many of the area residents are of Mormon pioneer heritage, devoutly religious, and independent (San Juan County 2002b). The County's residents are interested in maintaining the rural lifestyle, coupled with strong family values, and a quality environment that has been so much a part of their past (San Juan County 1996).

Maintaining the rural character of San Juan County has been a struggle for area residents. Most agricultural producers are no longer able to support themselves on farming and ranching alone. And because federal, state, and tribal governments manage over 90% of the land, residents believe that much of the county's potential wealth is tied to its public lands. Therefore, communities are very interested in public land-use management decisions.

San Juan County is a collection of diverse communities. Blanding and Monticello are the only incorporated towns and together contain the majority of the non-Reservation population of the county. Oljato, Aneth, Montezuma Creek, Navajo Mountain, and Halchita are all communities within the Navajo Reservation. White Mesa is associated with the Ute tribe. Schools are a large part of the identity in the county. Each community is described in Table 3.26.

**Table 3.26. Communities in San Juan County**

<b>Community</b>	<b>Population</b>	<b>Structure</b>	<b>Characteristics</b>
Blanding	3,162	Incorporated	Largest community in San Juan County. Higher education including College of Eastern Utah—San Juan branch, and Utah State University Education Facility. Edge of Cedars State Park, Dinosaur Museum.
Monticello	1,958	Incorporated	Serves as the county seat, home of government offices for San Juan County. Location of BLM Monticello FO, and the Monticello Ranger District of the USFS.
Monument Valley and Oljato	864	Unincorporated town; Navajo Chapter Headquarters; part of Navajo Nation	Communities function together. Monument Valley is a Navajo Tribal Park known for scenic beauty. Gouldings Lodge associated with the Park is the major employer for the community.
Aneth	598	Unincorporated town; Navajo Chapter Headquarters; part of Navajo Nation	Home to Aneth oil field, a major producer of oil and gas in Western states. Location of Navajo boarding school.
Montezuma Creek	507	Unincorporated town; Part of Navajo Nation	Aneth oil field is close and provides jobs. Hovenweep National Monument is 20 miles northeast.
La Sal	400	Unincorporated town	Closely tied to Moab and Grand County. Settled originally for ranching, has experienced the boom and bust cycles of mining, and now most people work in Moab.
Navajo Mountain	379	Unincorporated town; Navajo Chapter Headquarters; part of Navajo Nation	Remote from anywhere in San Juan County
Mexican Hat and Halchita	358	Unincorporated town; Navajo Nation	Mexican Hat is on the north side of the San Juan River and Halchita is on the south side. Halchita is part of the Navajo Nation.
Bluff	320	Unincorporated town	On the bank of San Juan River. First Anglo-settled community in the county. Historic community with many Victorian homes still in use. Staging area for San Juan River trips. Many outfitters based in Bluff.

**Table 3.26. Communities in San Juan County**

Community	Population	Structure	Characteristics
White Mesa	277	Unincorporated town, governed by Ute Council; Ute Reservation	Branch of Ute Mountain Tribe headquartered in Colorado. Sits between Blanding and Bluff.
Spanish Valley	181	Unincorporated town	Closely aligned with Moab and Grand County, although lies within San Juan County
Eastland	130	Unincorporated town	Settled as a farming community and is still surrounded by cultivated fields.
Halls Crossing	89	Unincorporated town	On the shores of Lake Powell. Employment is dependent on Lake activities.

Source: San Juan County 2002b.

As mentioned above, 65% of land in San Juan County is public lands under state and federal jurisdiction. A statewide social survey was conducted by Utah State University (USU) in 2007 to assess the ways in which Utah residents use and value public land resources and their views about public lands management. A complete analysis of the results had not been completed as of February, 2008. "Public lands," as described in the study, consist of all federal and state managed lands, and not only the BLM. Surveys were mailed to a random sample of residents of all 29 Utah counties. According to the authors, the study and sample sizes are designed to produce results generalizable at the state-wide level, with generalization increasingly risky as the sample area diminishes.

The areas sampled do not necessarily coincide with field office PA boundaries, as that was not the focus of the study. Nonetheless, the study provides current and interesting results not available elsewhere, and shows the dependence of local communities on public lands for a variety of economic and recreational pursuits. Appendix R contains initial summary results for Grand and San Juan Counties lying within the Monticello Field office. Where appropriate, study results are incorporated within the discussion of individual resources in Chapter 4. There is nothing in the preliminary USU results that affect the formulation of alternatives in Chapter 2 or the analysis of impacts in Chapter 4.

#### **3.13.4.2 ECONOMIC SETTING**

This section describes existing economic conditions surrounding the Monticello PA and provides a baseline for assessing the potential impacts of the RMP alternatives. Based on the implementation of a particular alternative, the BLM can affect (directly or indirectly) the local economic conditions of the nearby communities. For example, local employment and income levels can be directly impacted by changing the way it manages natural resources or grazing allotments. The construction of new recreation trails or facilities, road maintenance, and other activities can also influence local socioeconomic conditions described in this section. The BLM

can also indirectly influence local economic conditions by pursuing new management strategies that alter visitation levels, thus affecting total future spending by recreationists and other tourists (BLM 2004e). The demographic information and selected economic indicators of social well-being (poverty, unemployment, and per capita household income) are also presented in this section to help provide context and put local conditions in perspective relative to statewide conditions.

#### **3.13.4.2.1 POPULATION**

The Utah Department of Workforce Services reports that San Juan County has posted positive population growth numbers for every decade of the twentieth century. In 1900, the county had 1,023 residents, and by 2000, the population grown to 14,413. During the 20th century of growth the county did experience a number of population booms. Throughout the 1950s and the Cold War the demand for the county's uranium caused the population to double in just 10 years. San Juan County's population boomed again in the 1970s as the nation's high energy prices made the development of the area's natural resources profitable (Workforce Services 2005). As mining jobs decreased in the 1980s out-migration of the population occurred.

The Governor's Office of Planning and Budget (GOPB) for the State of Utah projects that population in 2030 will reach 19,459. The population growth rate of San Juan County is slower than that of the State of Utah: approximately 1% annual growth in the county, versus 2.3% annual growth in the state. Long-term trends show steady growth: from 1970 to 2000 San Juan County grew by 4,680 people, a 48% increase in population. Much of the recent growth in San Juan County has been in southern Spanish Valley, adjacent to Moab; this area is located within the boundaries of the Moab Field Office. The 2004 population estimate data show San Juan County has a total of 14,353 residents, slightly below that 2000 Census data (Workforce Services 2005).

The median age for the county is 25.5, similar to the state median age of 27.1. Table 3.27 shows population characteristics in San Juan County. 43% of the population is under 20 years old, a 4% decrease since 1990.

The 2000 Census indicated that American Indian/Alaskan Native made up 1.33% of the Utah population. In San Juan County the American Indian/Alaskan population is more than half of the total population at 55.7% (Table 3.28). Population on the Navajo Nation has grown steadily over the last two decades. In 1980 population on the reservation was 4,554, 5,252 in 1990 and 6,280 in 2000. The Navajo Reservation has experienced strong growth in its middle-aged population and slow growth in its youth population; this growth is contrary to many Native American groups (GOPB 2002). In 2000, nearly half of the population on the Reservation was between 20 and 65 years old (U.S. Census Bureau 2000). Table 3.28 shows steady increase in overall San Juan County population according to race and ethnicity.

**Table 3.27. Population by Category, 1990 and 2000**

	1990	% of Total	2000	% of Total	% Change, 1990–2000	% Change per Year, 1990–2000
Population	12,621		14,413		14	1.4
Male	6,245	49	7,190	50	15	1.5
Female	6,376	51	7,223	50	13	1.3
Under 20 years	5,898	47	6,176	43	5	.5
65 years and over	890	7	1,214	8	36	3.6
Median age			25.5			

Source: Sonoran Institute 2003.

**Table 3.28. San Juan County Population by Race and Ethnicity**

	1990		2000	
	Total Population	Percent of Total	Total Population	Percent of Total
<b>RACE</b>				
White	5,501	43.6	5,876	40.8
Black	11	0.1	18	0.1
American Indian/Alaskan Native	6,859	54.3	8,026	55.7
Asian	14	0.1	25	0.2
Hawaiian/Pacific Islander	26	0.2	5	0.0
Other	210	1.7	245	1.7
Two or more races	NA	0.0	218	1.5
<b>Total</b>	<b>12,621</b>	<b>100.0</b>	<b>14,413</b>	<b>100.0</b>
<b>ETHNICITY</b>				
Hispanic	440	3.5	540	3.7
Non-Hispanic	12,181	96.5	13,873	96.3
<b>Total</b>	<b>12,621</b>	<b>100.0</b>	<b>14,195</b>	<b>100.0</b>

Note: Population is broken out by both race and ethnicity because Hispanics can be of any race.  
Source: GOPB 2002.**3.13.4.2.2 UNEMPLOYMENT**

Unemployment levels are frequently used as an indicator for economic strength of the local economy and social well-being of its population. Table 3.29 presents the size of the labor force and average annual unemployment rates in San Juan County. State of Utah unemployment information is given for comparative purposes.

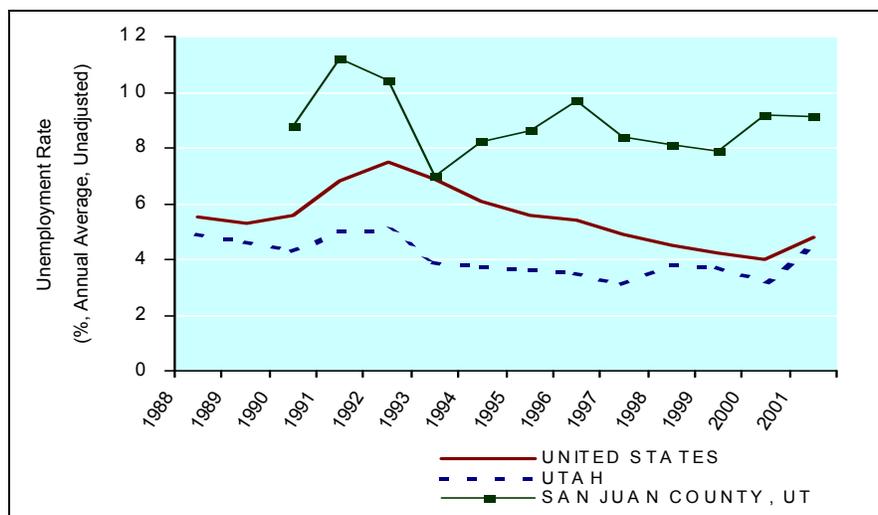
**Table 3.29. Unemployment Rates**

	1990		2000		2004 (projected)	
	Labor Force	Unemployment Rate	Labor Force	Unemployment Rate	Labor Force	Unemployment Rate
San Juan County	4,032	7.4%	4,754	9.2%	4,682	11.0%
State of Utah	814,000	4.3%	1,143,200	3.3%	1,208,400	4.7%

Source: Workforce Services 2005.

Unemployment in San Juan County is higher than the state or national average. In 2004 the unemployment rate in San Juan County was 11.0%, compared to 4.7% for the state and 5.3% for the nation. Employment grew by roughly 1.8% from 2000 to 2004, but the rise in jobs did very little to decrease the rising unemployment rate. Slow job growth and high unemployment levels are symptomatic of an economic community that is working to stabilize itself (Workforce Services 2005). Figure 3.9 shows the fluctuation in unemployment patterns in the county.

Over the past two decades, the Navajo Reservation has consistently experienced unemployment rates higher than the state average. In 1988, the unemployment rate in Utah was approximately 5.5%; in San Juan County it was approximately 8%, and on the Reservation it was almost 40%. This rate decreased to just above 30% in 2000 (U.S. Census Bureau 2000).



Source: Sonoran Institute 2003.

**Figure 3.9. Unemployment.**

### 3.13.4.2.3 PER-CAPITA PERSONAL INCOME<sup>3</sup>

Personal income is another indicator of social well-being, as income can be directly related to an individual's or a community's quality of life. Table 3.30 shows per capita personal income (i.e.,

<sup>3</sup> Personal income is the income that is received by persons from all sources. It is calculated as the sum of wage and salary disbursements, supplements to wages and salaries, proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, personal dividend income, personal interest income, and personal current transfer receipts, less contributions for government social insurance. This measure of income is calculated as the personal income of the residents of a given area divided by the resident population of the area. In computing per capita personal income, BEA uses the Census Bureau's annual midyear population estimates (U.S. Department of Commerce 2005).

total personal income divided by population) in San Juan County and in Utah. Per capita personal income in the county has been consistently lower than the state average. In 2003 San Juan County had the lowest per capita income in the state.

**Table 3.30. Per-capita Personal Income**

Area	1980	1990	2000	2003
San Juan County	\$5,841	\$8,955	\$12,881	\$14,363
Navajo Reservation	\$4,500 (approx)	\$5,300 <sup>1</sup> (approx)	\$6,200 (approx)	--
State of Utah	\$8,510	\$14,913	\$23,878	\$25,407

Source: U.S. Department of Commerce 2005; GOPB 2003.

<sup>1</sup> Data from 1999.

-- = no data available.

#### 3.13.4.2.4 POVERTY

The poverty rate of an area is an estimate of the percentage of the area's total population living at or below the poverty threshold established by the U.S. Census Bureau. Table 3.31 presents poverty rates in San Juan County, with statewide figures included for comparative purposes.

**Table 3.31. Poverty Rates**

Area	1989	2003
San Juan County	36.4%	22.6%
State of Utah	11.8%	10.0%

Source: U.S. Census Bureau 2005.

Poverty rates for San Juan County are significant higher than the state average. Although the rate decreased significantly from 36.4% in 1989 to 22.6% in 2003, it is more than double the state's overall rate. The race with the highest poverty rate in San Juan County is the "American Indian and Alaskan Native," with 3,809 (48%) of the total race under the poverty level in 1999 (Sonoran Institute 2005).

#### 3.13.4.2.5 HOUSING

According to the 2000 Census, San Juan County has a total of 5,449 housing units, 75% of which are occupied. Of these units, 13.5% are for seasonal and recreational use, and 20% are renter-occupied. Average household size is 3.57 residents, just above the state's average. The median value of owner-occupied housing in 2000 was \$68,400, up from \$52,833 in 1990. Table 3.32 shows housing population trends in San Juan County.

**Table 3.32. Population by Household Type in San Juan County, 2000**

	County	% of Total	State	% of Total
Total housing units	5,449		768,594	
Total occupied housing units	4,089	75.0	701,281	91.2

**Table 3.32. Population by Household Type in San Juan County, 2000**

	County	% of Total	State	% of Total
Seasonal, recreational, or occupational use	733	13.5	29,685	3.9
Vacant housing units	1,360	25.0	67,313	8.8
Homeowner vacancy rate (%)	2.1%		2.1%	
Rental vacancy rate (%)	12.8%		6.5%	
Housing tenure				
Total occupied housing units	4,089		701,281	
Owner-occupied housing units	3,242	79.3	501,547	71.5
Renter-occupied housing units	847	20.7	199,734	28.5
Average household size, owner occupied	3.57		3.3	
Average household size, renter occupied	3.07		2.8	

Source: Sonoran Institute 2003.

Yet another indicator of economic strength is the amount of new residential building permits granted for a particular area. An increase or decrease in the amount of building permits granted reflects the growth of a community and allows planners and local governments to plan for the amount of necessary infrastructure (i.e., roads, water, sewer, and power).

Residential building permits for San Juan County have increased tremendously from 5 permits issued in 1991 to 76 permits in 1998. The amount of building permits has dropped slightly since then. There was a small rise in the number of permits issued for new dwelling units in 2004 as the county issued 61 permits, up from 55 in 2003. Residential construction in the unincorporated areas of San Juan County has consistently exceeded that within the cities of Blanding and Monticello. For example, in 2004 five permits were issued for dwelling units in Blanding, 3 permits were issued for Monticello and 53 permits were issued for unincorporated areas in the county (Workforce Services 2005).

It should be noted that residential growth has been particularly strong in the Spanish Valley area, just south of Moab, Utah. Most of the growth occurring in this San Juan County area is affected primarily by the land management decisions of the Moab FO's RMP, whose office covers the northern third of San Juan County. For general housing conditions in the Spanish Valley area please see the Moab RMP.

#### **3.13.4.2.6 EMPLOYMENT**

Local and regional employment levels could be affected directly or indirectly by the implementation of the updated RMP. The following information reflects trends in employment since the 1970s.

In 2000, 5,618 jobs were identified in San Juan County. Wage and salary employment included approximately 79% of the total market while the remaining 21% was from proprietorships, including sole ownerships, partnerships and tax-exempt cooperatives. The Services and

Professional Sector is the largest employment sector in the county comprising 46% of the market. The Government sector accounts 30% of the total employment. The remaining jobs are in Farm and Agriculture Services, Mining and Manufacturing. Note that the Services and Professional sector includes services, retail trade, finance industries, transportation and public utilities, and wholesale trade (Table 3.33).

**Table 3.33. Employment by Industry, Changes from 1970 to 2000—SIC Codes**

	1970		2000		New Employment	
	Jobs	% of Total	Jobs	% of Total	Jobs	% of Total
Total employment	2,818		5,618		2,800	
Wage and salary employment	2,272	80.6	4,413	78.6	2,141	76.5
Proprietors' employment	546	19.4	1,205	21.4	659	23.5
Farm and agricultural services	414	14.7	N/A	N/A	N/A	N/A
Farm	398	14.1	318	5.7	-80	NA
Agricultural services	16	0.6	N/A	N/A	N/A	N/A
Mining	423	15.0	313	5.6	-110	NA
Manufacturing (incl. forest products)	147	5.2	220	3.9	73	2.6
Services and professional						
Transportation and public utilities	125	4.4	181	3.2	56	2.0
Wholesale trade	N/A	N/A	101	1.8	N/A	N/A
Retail trade	335	11.9	763	13.6	428	15.3
Finance, insurance and real estate	N/A	N/A	N/A	N/A	N/A	N/A
Services (health, legal, business, others)	378	13.4	1,509	26.9	1,131	40.4
Construction	147	5.2	303	5.4	156	5.6
Government	791	28.1	1,678	29.9	887	31.7

Agriculture Services include soil preparation services, crop services, etc. It also includes forestry services, such as reforestation services, and fishing, hunting, and trapping. Manufacturing includes paper, lumber and wood products manufacturing.

SIC = Standard Industrial Classification System (SIC) used to categorize employment trends over time.

Source: Sonoran Institute 2003.

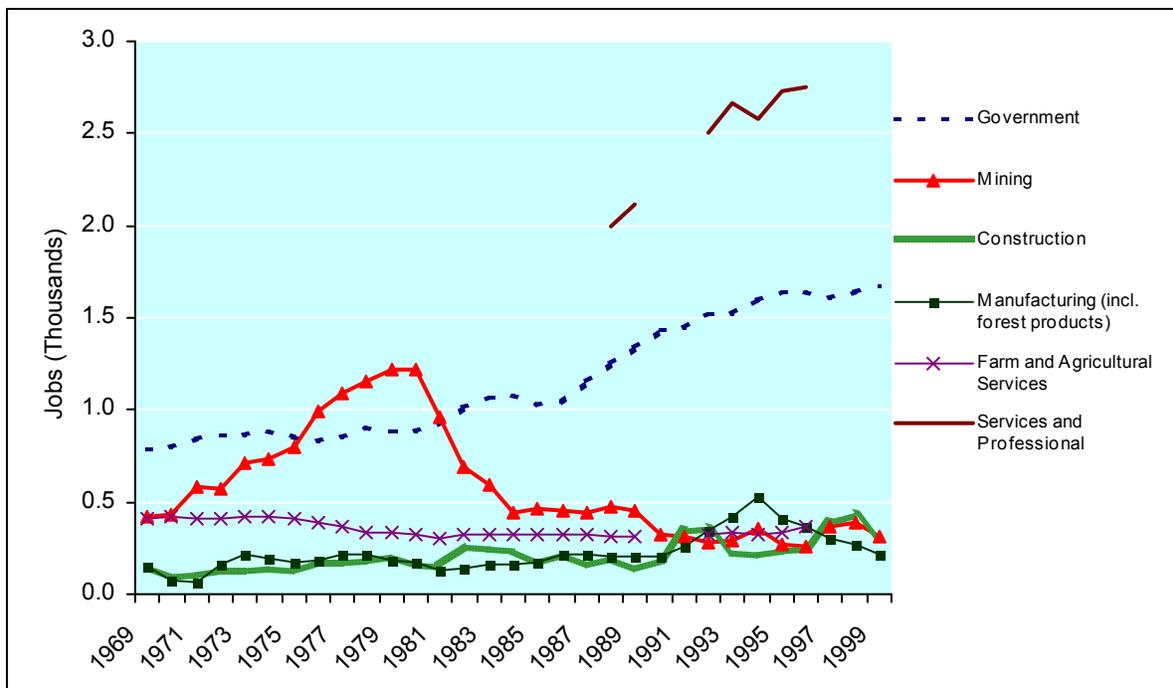
Characteristic of the rest of the state as well as the country, San Juan County has seen a large increase in the Services and Professional sector in the last two decades. The decrease in mining and farming operations, and the growth in the tourism as well as the overall growth in population can be largely accredited for the increase. The Services and Professional sector is expected to see continued growth.

### Shift in Regional Economic Activity

Perhaps more important to understanding the economy of San Juan County are trends in economic activity. Between 1970 and 2000, the San Juan County economy experienced a dramatic shift in job base. As shown in the graph below, the economy shifted away from mining

in the 1980s. Discussions with the community identify this curve as the "mining bust." Ed Scherick, San Juan County Planner, in a memo to the BLM on February 10, 2004 states that "the real reason for the bust was due to the shift towards a cheaper free market. This market went to cheaper sources to purchase the product because of time and costly delays created by environmental regulation and lawsuits. Agencies also placed more and more restrictions on exploration and development on leaseholders until they reached a point of collapse."

As jobs were lost in mining and farming, jobs in trade and services increased dramatically (see Table 3.33). Despite the lack of data for the Service and Professional sector, Table 3.33 shows a general recognizable trend in this sector as an increase in jobs in trade and services over the last 15 years. The trade and service sector employees a large amount of people to support the tourism industry around Lake Powell; however, many of these jobs are seasonal in nature, with most lasting from April to mid-October. Figure 3.10 illustrates the shift in employment sectors over time in San Juan County.



SIC= Standard Industrial Classification System used to categorize employment trends over time.  
Source: Sonoran Institute 2003.

**Figure 3.10. Job Base (by SIC code) in San Juan County, 1969–1999.**

The shift in service related jobs over the last decade illustrates the county's growing tourism industry. While this shift has added new jobs and revenue for the county, many residents are somewhat apprehensive about dependence on such an industry. Community residents are interested in maintaining a diverse economic base that includes grazing and agriculture, mineral extraction, oil and gas development, recreation and tourism (San Juan County 1996).

Direct BLM Contributions to Area Economic Activity

Under the federal Payment-in-Lieu-of-Taxes (PILT) Program, payments from the BLM and other federal agencies assist in financing the operations of local governments containing tax-

exempt public lands. The annual PILT payments serve as an offset payment to the local governments because, unlike privately owned lands, taxes are not collected from federal lands. Payment amounts are based on a complex formula that considers among other things revenue sharing from the previous year, county population, and acreage of a county in federal ownership. The PILT payments may be used for any governmental purpose including improving schools, road, water, and other infrastructure systems.

Because nearly 61% of San Juan County is federally owned land, PILT payments are important to the area. PILT payments to San Juan County have continually increased in recent years. Table 3.34 shows PILT Payments to San Juan County between FY 2001 and FY 2006.

**Table 3.34. PILT Payments to San Juan County**

Year	Total PILT Payment
2001	\$637,790
2002	\$666,505
2003	\$769,099
2004	\$790,844
2005	\$807,435
2006	\$822,532

Source: USDI 2005.

### **3.13.4.2.7 LOCAL ECONOMIC ACTIVITY AFFECTED BY BLM MANAGEMENT**

#### Recreation and Tourism

The natural landscape in San Juan County has drawn visitors from all over the world. Visitors to the PA are involved in a multitude of outdoor activities, including mountain biking, hiking, boating, camping, climbing, OHV driving and general recreation. These activities occur in this area because of the large expanses of vast and relatively undeveloped lands and because of the unique geologic and scenic beauty the area has to offer. Since the later part of the twentieth century, the tourism industry has become an increasingly important revenue generator for the county. Although many people feel that the county should maintain a diverse economy that does not depend too heavily on tourism, the economic value of the tourism industry is recognized as an important source of revenue (San Juan County 2002b). More information on the recreation and tourist destinations within the Monticello PA can be found in Section 3.11, Recreation.

Visitation data can be used to illustrate tourism and recreation trend in the Monticello PA. Visitation to the area, outside of BLM lands, follows the traveler-spending trend, as it increased throughout the 1990s and has leveled off in the new century. Table 3.35 shows visitation numbers for several locations in San Juan County that can be used as indicators for visitation to the area.

**Table 3.35. Visitation to Local Attractions in 2003**

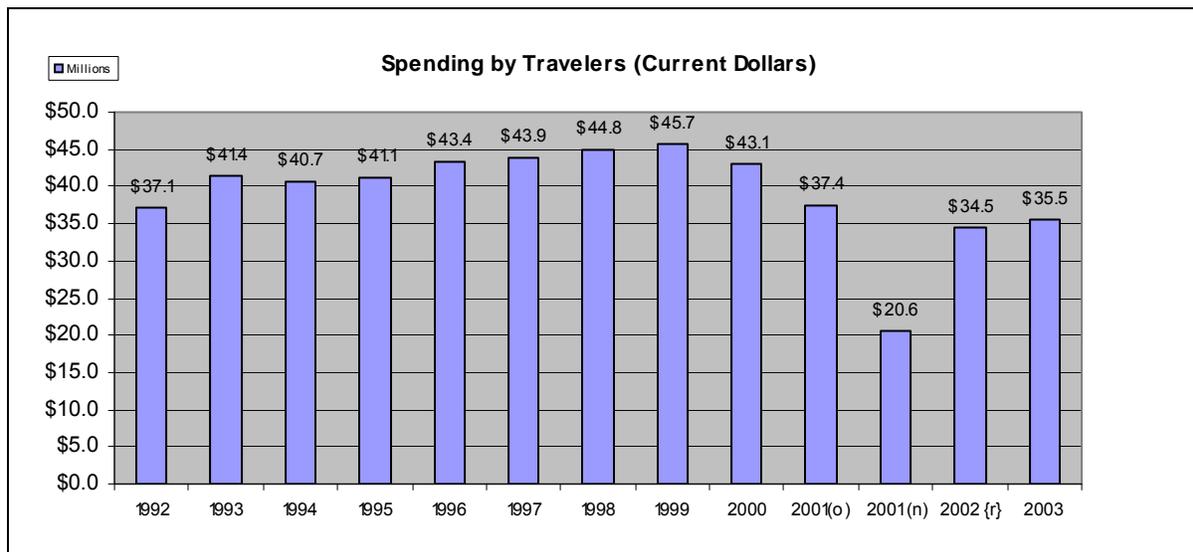
Count Location	Visitors
US 491 Utah–Colorado border	784,750

**Table 3.35. Visitation to Local Attractions in 2003**

Count Location	Visitors
SR 163 Utah–Arizona Border	730,800
Glen Canyon NRA	1,842,942
Monument Valley	218,000
Canyonlands National Park	386,985
Gooseheads State Park	57,098
Rainbow Bridge National Monument	98,865
Hovenweep National Monument	25,134
Natural Bridges National Monument	118,965

Source: Utah Division of Travel Development 2004.

Tourism is considered a resource-based industry, because the visitors who come to the county recreate on public lands and rivers. These same visitors contribute to the tax base of the county, which helps stimulate the local economy. Tourist spending, visitation to locations in close proximity, as well as tax collections from tourist activity are indicators of tourism in San Juan County and its importance to the overall economy. Traveler spending in San Juan County grew slowly and consistently throughout the 1990s. In 1990, traveler spending was slightly under \$33 million. Spending peaked in 1999, at over \$45.7 million and decreased to \$35.5 million in 2003. Figure 3.11 shows traveler spending from 1990 to 2003.



Source: Utah Division of Travel Development 2004.

**Figure 3.11. Tourist Spending San Juan County, 1992–2003.**

The Utah Division of Travel Development reports that travelers spent \$35.5 million dollars in San Juan County in 2003 and 1,083 jobs in the county were travel and tourism related. Total tourism-related tax revenues for 2003 were estimated at \$744,000, down from \$879,000 in 2000 (see Table 3.37). It is important to note that many tourists spend their money in and around the city of Moab in Grand County, before traveling to San Juan County to recreate.

San Juan County ranked twelfth out of 29 counties in the state for gross taxable room rents at 7.2 million in 2003. Gross taxable room rents increased steadily from 1996 to 1999 and have dropped continually since 2000. San Juan County is also twelfth in collection of transient room tax: \$218,400 in 2000. This number reached its peak in 1999 and has slowly dropped since then. San Juan County does not collect restaurant or car rental taxes (Utah Division of Travel Development 2004). Table 3.36 shows the contribution of tourism to the local economy.

**Table 3.36. Tourism-related Tax Trends in San Juan County**

County Indicator	1996	2000	2003
Spending and employment			
Spending by traveler (millions)	\$43.4	\$43.1	\$35.5
Travel and tourism related employment (jobs)	800	816	1,083
<b>Tourism Tax Revenues (000s)</b>			
Local tax revenue from traveler spending	\$902	\$897	\$744.2
Gross taxable room rents	\$8,065	\$8,243	\$7,278
Transient room tax	\$241.9	\$247.3	\$218.4
Restaurant tax	--	--	--
Car rental tax	--	--	--
<b>Gross taxable retail sales (millions)</b>	<b>\$84.0</b>	<b>\$89.3</b>	<b>\$85.2</b>

Source: Utah Division of Travel Development 2004.

#### Budget and Fee Collection for Programs

Due to a lack of base budgetary support, the Monticello FO has come to rely on the Federal Lands Recreation Enhancement Act, generally called the Fee Demonstration program, for needed funds. The Monticello FO collects fees for recreational use in several locations including the San Juan River, Cedar Mesa and fee collection sites at 3 campgrounds.

Services to the public are provided from these fee monies, such as maintenance of campgrounds, boat ramps, and restroom facilities; staffing of the San Juan River Ranger Station and the Kane Gulch Ranger station; and expenses related to the San Juan River and Cedar Mesa permit activities.

Table 3.37 below shows the Base Funding for the Recreation Program in 2003, and visitation and revenues from the Fee Demonstration projects.

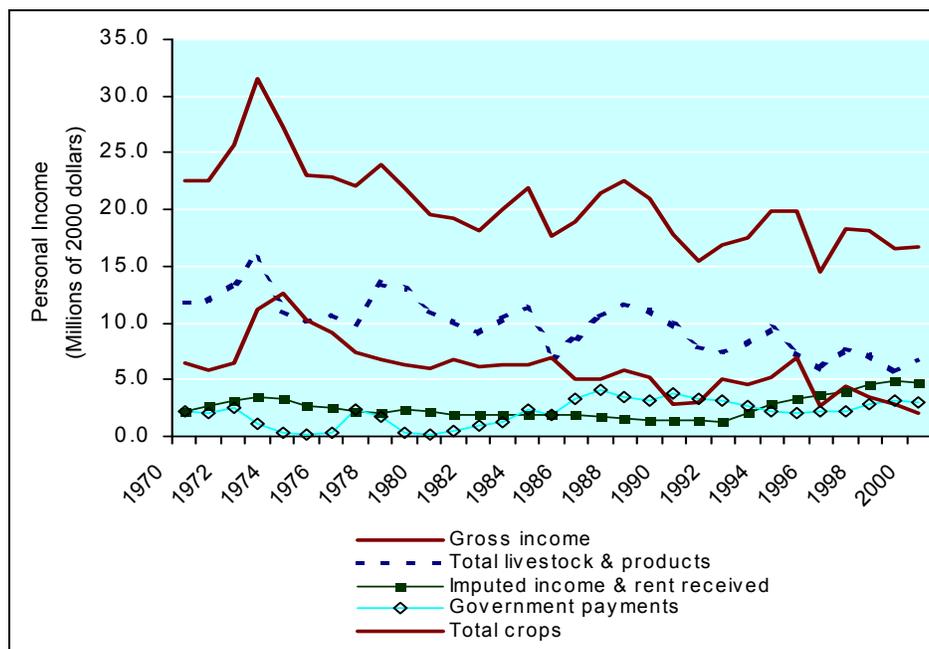
**Table 3.37. Base Funding for Recreation and Fee Demonstration Projects (BLM 2005c)**

	2002 Visitation	2002 Revenues	2003 Visitation	2003 Revenues
San Juan River	13,048	\$105,822	13,690	\$116,591
Cedar Mesa	8,065	\$65,236	8,283	\$62,435
Monticello—other	81,269	0	75,338	\$39,487
Recreation—base funding				\$98,000
<b>Total</b>	<b>102,382</b>	<b>\$171,058</b>	<b>97,311</b>	<b>\$316,513</b>

## Agriculture and Grazing

The agriculture industry has declined in the last 3 decades. Several factors contributed to the decline, including drought, market prices, and world politics. In 1970, total net income from farming and ranching in San Juan County was \$8.8 million. By 1985, that number had dropped to \$-0.8 million and in 2000, to an all-time low of \$-2.1 million. Negative net income means that production expenses were higher than gross income. In San Juan County, 41% of gross agricultural and grazing income is from livestock and products, and 12% of gross income is from crop production.

The remainder of income is from government payments and rents received. Figure 3.12 shows the decrease in personal income from farming and ranching.



Source: BLM 2004e.

**Figure 3.12. Income from agriculture, 1970–2000.**

The composition of livestock and crop production has also shifted in the last decade. In 1970, 52% of gross farm income was from livestock, while 28% was from crops. Gross income from crops has dropped by 16% since 1970. Currently, San Juan County's main agricultural contributors are wheat, pinto beans, safflower, and cattle (San Juan 1996).

While the income generated from farming and ranching has decreased significantly in past decades, the number of farms has actually increased. In 1982 the number of farms was 214 and in 2002 the number grew to 231. A significant number of farms in San Juan County are 1,000 acres or more and the average farm size has jumped from 1,696 acres in 1982 to 6,747 acres in 2002. Table 3.38 shows the trends agricultural data for San Juan County.

**Table 3.38. San Juan County Agricultural Data**

	1982	1987	1992	1997	2002
Farms (number)	214	218	206	231	231
Land in farms (acres)	362,921	340,449	324,921	1,673,079	1,558,661
Average size of farm	1,696	1,562	1,577	7,243	6,747
<b>Farms by Size</b>					
1–9 acres	17	12	10	8	16
10–49 acres	17	22	24	21	38
50–179 acres	22	27	26	36	43
180–499 acres	30	29	29	39	32
500–999 acres	31	29	30	29	19
1,000 acres or more	97	99	87	98	83
Market value of agricultural products sold	8,367	9,370	8,990	9,097	7,516
Operators by principal occupation, farming	120	123	112	115	140
Operators by principal occupation, other	94	95	94	116	91

Source: Workforce Services 2005.

The BLM provides livestock grazing opportunities on public lands for local ranchers through the administration of livestock grazing. These permits generate local income and employment benefits to ranchers and their employees as well as other economic benefits to the county, including sales, income tax revenue, and indirect expenditures made by ranchers to local service or industry. Changes in Monticello FO grazing practices could potentially affect the local economy.

Livestock grazing allotments occur on approximately 99% of all BLM lands located within the Monticello FO boundary. An estimated 17,300 acres outside of grazing allotments are allocated to wildlife use and another 288 acres are administrative horse pasture. Within boundary allotments, 137,440 acres (6.1%) are unavailable for livestock grazing for resource protection.

Of the lands within grazing allotments, 1,761,351 acres (78%) are BLM lands. Of the 74 allotments currently permitted within the Monticello PA boundaries, cattle graze 61 allotments and cattle and horses graze 13 allotments. A total of 78,796 animal unit months (AUMs) are currently authorized (active). Of these, 77,365 AUMs (98 %) are used by cattle and 1,431(2%) are used by horses. An additional 7,299 AUMs are allowed through exchange of use (other ownership). For more information on current grazing conditions, please see Section 3.7, Livestock Grazing.

### Mineral Resources

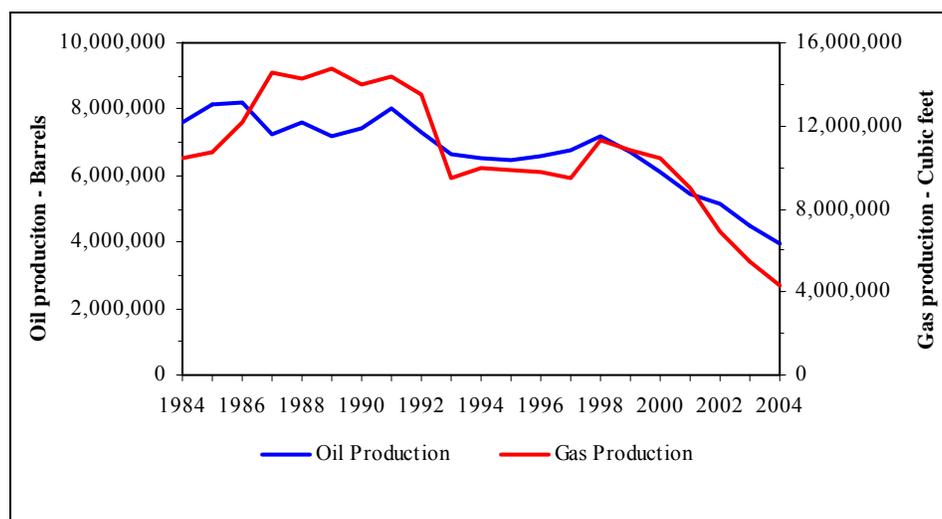
The contribution of mineral extraction to the San Juan County economy has fluctuated throughout the previous century. Since the demand for uranium decreased in the in the early 1980s, mineral extraction has contributed minimally to the local economy and local job base. In 2004, mining jobs contributed only 4% of non-farm jobs (163 out of 3,936 non-farm jobs) in the county (Workforce Services 2005). Oil and gas production within the Monticello PA has

generally been declining since 1984, but has decreased more rapidly since 1998 (see Figure 3.9). As of March 2005, there have been 3,267 wells drilled in the Monticello PA, of which 2,132 wells have been plugged and abandoned. Of the remaining 1,135 active wells, 508 are currently producing oil and gas. Approximately, 41% of the wells drilled in San Juan County during the period of 1991–2004 were dry (BLM 2005h).

The economic benefit to San Juan County of oil and gas activities comes primarily in the form of mineral lease payments and royalties from the State of Utah to the county. The State of Utah collects payments from a variety of sources, including lease and royalty payments made to the BLM and to the Minerals Management Service of the Department of the Interior. Royalties are based on the sale of oil and gas and increase or decrease based on quantity of production and prices. Approximately one-half of the payments received by these agencies are remitted to the State of Utah, which in turn distributes about one-half to the counties. The State of Utah payments to the counties are based very closely on actual leasing and production activities within each county.

According to the Mineral Management Service, in the 2000 fiscal year, San Juan County reported a total of \$5,955,862 in sales volume for gas, and \$633,808 in sales volume for oil. Royalty values to the State of Utah were \$1,848,180 and \$1,638,434, respectively. The amount disbursed to the state was \$924,590 for gas and \$819,217 for oil (USDI 2000). Oil and gas production has been steadily declining since 1990. In 1990 San Juan County produced 7,774,204 barrels of oil and 29,580,534 thousand cubic feet (MCF) of gas. In 2004 the county produced 3,986,802 barrels of oil and 17,392,707 MCF of gas. Figure 3.13 illustrates oil and gas production trends in San Juan County.

A potential benefit to San Juan County from oil and gas and mineral production is in the jobs created, both in direct production activities and associated services. Many of the current oil and gas activities are located on the Utah–Colorado border and some of those employed live in western Colorado. The White Mesa Mill employs approximately 40 people and most are living in or around the town of Blanding.



Source: BLM2005d.

**Figure 3.13. Production from oil and gas wells in the Monticello FO.**

The Utah Permanent Community Impact Fund Board (CIB) provides loans and grants to agencies within the state that may be socially or economically impacted by mineral resource development on federal lands. In 2005 San Juan County received \$2,536,232 in loans and grants from the CIB. From fiscal year 2001–2005 the county received \$3,027,588 (Department of Community and Culture 2005). The source of CIB's funding is a portion of the federal mineral lease royalties returned to the State of Utah by the federal government. The money from the CIB to fund various infrastructure projects is not directly related to the amount of production per county, but rather on applicant eligibility determined by the Board.

A recent increase in the price of uranium has led to a surge of filings for uranium claims within the Monticello PA. According to the Mineral Potential Report, the price of uranium was \$29.00 per pound in May of 2005 (BLM 2005b). While the thousands of claims filed in 2004 and 2005 do not necessarily predict a resurgence of a uranium boom in the area, exploratory holes are being drilled and the potential for impacts to socioeconomics could result from uranium extraction on BLM lands.

#### **3.13.4.3 TRIBAL INTERESTS**

The high acreage of Navajo lands is a significant factor in the social and economic conditions of the county, as in the case of San Juan County's unique tax laws regarding the Reservation. Oil and gas companies as well as other Anglo businesses on the reservation are taxed by the county; however, the personal property of tribal members (homes, vehicles) on the reservation do not contribute to the county's tax base. The reservation receives revenue from oil and gas lease fees on its land; however, it is not eligible to receive royalties generated from oil and gas production. The Navajo Tribe Utilities Authority (NTUA) provides infrastructure services such as sewer and water on the reservation, as opposed to the county services. San Juan County also does not provide law enforcement on the reservation, however, the county search and rescue is used by the reservation.

Over the last 10 years, the Navajo Nation has gone from living in scattered units to living in more consolidated centers, such as Aneth, Montezuma Creek, and Shiprock, New Mexico. This shift has made it easier to make essential services more available to tribal members. However, not all Navajos have made this shift. More traditional people and the elderly have been more reluctant to change their living circumstances.

The Navajo Nation currently depends less on grazing of sheep and the sale of sheep products than in the past, and more on wage work. A large percentage of available jobs are government jobs, and many people travel off the Reservation for this work. Crafts have been an important way for Navajos to augment wage income, and most of the resources needed are found on public lands. These resources include firewood, pinyon nuts, willow for baskets, cottonwood root for carving, and plants to make paint pigment. Continued use of these lands and its resources are important in sustaining this aspect of Navajo livelihood.

According to the public scoping meetings and consultation with tribal leaders, access to sacred sites, gathering of traditionally used plants and minerals, tribal consultation, and the protection of

cultural resources (including places, burials, and plants) are issues requiring attention by the Monticello FO as land management decisions are made (SWCA 2004).

### **3.13.5 ENVIRONMENTAL JUSTICE**

#### **3.13.5.1 BACKGROUND AND REGULATORY GUIDANCE**

"Environmental justice" refers to the fair and equitable treatment of individuals regardless of race, ethnicity, or income level, in the development and implementation of environmental management policies and actions. In February 1994, President Clinton issued Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority and Low Income Populations." The objective of this EO is to require each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low income populations (EO 12898 1994).

Convened under the auspices of the EO, the Interagency Working Group defines Black/African American, Hispanic, Asian and Pacific Islander, American Indian, Eskimo, Aleut, and other non-white persons as minority populations. Low-income populations are defined as persons living below the poverty level based on total income of \$13,359 for a family household of 4 based on the 2000 census. Minority populations are identified as either: (1) the minority population of the affected area exceeds 50%, or (2) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate geographic area (BLM 2002c).

#### **3.13.5.2 MINORITY AND LOW-INCOME POPULATIONS**

Land use management decisions within the Monticello PA have the potential to directly or indirectly affect the county's minority and low-income populations.

Unique to Utah, populations in San Juan County typically known as "minority" comprise more than half of the population in San Juan County. San Juan County ranks first in the state for Native American/Alaskan Native population. San Juan County is home to 27% of the state's Native American population and at 55.7% of the county's total population, Native Americans are not the minority. In Utah, 93.8% of the entire population identify themselves as white and 1.3% of the population identify themselves as Native American/Alaskan Native (GOPB 2002). Therefore, when considered state or region-wide, Native Americans are considered a minority race. Despite the population data that indicate non-minority status within San Juan County, Native Americans are considered a minority group for the purposes of achieving environmental justice during this RMP process.

As mentioned earlier within the context of "poverty" as an economic indicator for the economic well-being, persons in San Juan County living below the poverty line in 2003 was higher than the state average (22.6% vs. 10%). While San Juan County poverty trends show a decrease over time they remain higher than the state average. In 2003 the poverty level established by the by the Census Bureau for a family of 4 was \$18,810 and in that year 31% or 4,443 people in San

Juan County were living below the poverty level (U.S. Census Bureau 2006). In terms of race, the Native American population has the highest poverty level in the county at 48% or 3,809 individuals.

### **3.13.5.3 ADDITIONAL ENVIRONMENTAL JUSTICE ISSUES**

Potential land management decisions pertaining to woodlands in the Monticello PA could disproportionately affect the area's low-income and minority population. Navajo tribal members have been gathering wood in the Cedar Mesa area and using the resource as their primary heat source in the winter months. Unmanaged woodland harvesting has damaged surface cultural resource sites and created a network of unauthorized roads and trails that degrade visual quality, and which also may increase soil erosion and sedimentation, and affect overall watershed quality. Through the development of the RMP, it is anticipated that an organized and systematic plan will be developed to allow the Navajo Tribe to remove fuelwood and minimize future damage to the area.

Native Americans also want to be able to collect live cottonwood, however, this species is valuable for wildlife (T&E species) habitat, riparian function, and overall watershed health. It currently is at risk of being replaced by invasive species including tamarisk. The access and gathering of other plants traditionally used by tribes is an issue within the Monticello PA. Plants important to Native American's traditional cultural practices include: willows, sage, yarrow and squirrel tail (SWCA 2004).

## **3.14 SOILS AND WATER**

### **3.14.1 RESOURCE OVERVIEW**

Watershed incorporates several separate resources (soil, water, etc) and takes into consideration the interaction between them and their effect on conditions and processes occurring on the landscape, culminating with their impact on surface water quality. To assess these impacts, the resources that are discussed in this section are soils and surface water.

### **3.14.2 WATERSHEDS AND GENERAL TOPOGRAPHY**

The Monticello PA lies within portions of nine separate hydrologic subbasins (Table 3.39) located within the Upper Colorado hydrologic region (Region 14). The majority of the PA is contained within the San Juan subbasin, though the northern portion of the PA is largely within the Kane Springs subbasin. Subbasin boundaries are shown on Map 49, and are described in Table 3.39.

The PA is also within an administrative area designated by the Utah Division of Water Resources (UDWRe) called the Southeast Colorado River Basin. The boundaries of this area are a mix of political and geographic features, and almost completely overlap the Moab and Monticello PAs.

**Table 3.39. Subbasins within the Monticello PA**

4th Order HUC	Subbasin Name
14030005	Upper Colorado – Dolores – Kane Springs
14070001	Upper Colorado – Dirty Devil – Upper Lake Powell
14080201	Lower San Juan – Four Corners
14080202	Lower San Juan – McElmo
14080203	Lower San Juan – Montezuma
14080205	Lower San Juan – Lower San Juan

The topography of the Monticello PA is defined largely by high mountains, steep escarpments, and incised canyons. The boundaries of the PA itself are defined by the Colorado border to the east, the San Juan River and Navajo Indian Reservation to the south, and the Colorado River to the west. The northern boundary of the Monticello PA approximately follows the elevational divide along Hatch Point, and the Lower Lisbon Valley. Elevations vary from 3,700 feet above mean sea level (amsl) in the southwest near Lake Powell, to approximately 7,500 feet amsl near the base of the Abajo Mountains.

The Abajo Mountains themselves lie within the Manti–La Sal National Forest and are the highest topographic features in the PA. Dry Valley extends north from the Abajo Mountains. The region west of the Abajo Mountains consists of a deeply incised plateau, and includes the Canyonlands National Park. The southern portion of the PA that extends from the Abajo Mountains to the San Juan River is characterized by similar terrain, though less steep, and an overall loss in elevation to about 4,500 feet amsl at the River.

### **3.14.3 GEOLOGY**

The geology of the Monticello PA is characterized primarily by the relatively flat stratigraphic sequence of sedimentary units dating from the Cretaceous, Jurassic, Triassic, and Permian and Pennsylvanian periods. The older Permian and Triassic rocks, which include the Cutler Group and the Moenkopi formation and the Chinle Formation, dominate the area between the Abajo Mountains and the Colorado River. This area is known as the Monument Upwarp, a late Cretaceous uplift that resulted in the erosional removal of the younger strata from the underlying rock. The remainder of the Monticello PA is still dominated by younger sedimentary units of Cretaceous and Jurassic age, which includes the Dakota and Morrison Formations and the Glen Canyon Group.

### **3.14.4 SOILS**

Soils are the medium for plant growth, and soils provide nourishment for nearly all terrestrial organisms. Soils in the Monticello PA have developed in residuum (residual material from parent rock), colluvium (rock debris accumulated by gravity at the base of a cliff), alluvium (clay, silt, sand or gravel deposited by a stream or moving water), eolian sands (sands deposited by wind), and loess (yellowish brown loamy material deposited by wind). They are derived primarily from

the sedimentary geologic deposits that occur throughout the Monticello PA. Some soils are derived from igneous parent materials that occur around the Abajo Mountains.

### 3.14.4.1 SOIL DATA

Soil mapping for the Monticello PA was prepared using the Soil Survey Geographic database (SSURGO) for Utah. NRCS Soil surveys for the Monticello PA include:

- San Juan Area 1962
- San Juan County, Central Part 1993
- Canyonlands Area 1991

### 3.14.4.2 SOIL CLASSIFICATION

Aridisols (dry soils), Mollisols (soils with a dark surface horizon), Entisols (geologically young soils), and Alfisols (forested soils) comprise the Monticello PA soil orders. Soils are classified or grouped into similar categories based on physical and chemical properties. A soil order is the broadest soil taxonomic grouping. The next, more refined soil taxonomic level is the suborder. The finest level of classification is the series or phase. For the purposes of this discussion soils are summarized by order and suborder. Within the Monticello PA there are generally 5 major soil orders represented and 7 suborders. These are described and their acres summarized in Table 3.40.

**Table 3.40. Soil Orders and Suborders, Monticello PA** (BLM 2001a)

Soil Order Soil Suborder	Acreage	Description
<b>Aridisols (dry soils)</b>		
Argids	292,574 acres	Aridisols with clay accumulation in one or more subsurface horizons.
Orthids	354,966 acres	Aridisols without any exceptional characteristics.
<b>Entisols (developmentally young soils)</b>		
Fluvents	26,170 acres	Entisols formed in a fluvial environment, such as a floodplain.
Orthents	926,129 acres	Entisols are recently developed soils without any exceptional characteristics. Orthents are typically formed in colluvial and aeolian deposits. These soils are the most widespread in the Monticello PA.
<b>Mollisols (soils that have dark surface horizons due to organic matter accumulation)</b>		
Borolls	10,464 acres	Mollisols formed under cooler temperatures.
Ustolls	18,258 acres	Dry Mollisols (precipitation occurs more frequently than in Xerolls).
Xerolls	29,909 acres	The driest Mollisols (precipitation occurs less frequently than in Ustolls).
<b>Other Lands</b>		
Rock outcrop/ rubblelands/ water	354,966 acres	Includes all of these. No soil development is present on these lands; water makes up a small percentage of this acreage.

**3.14.4.3 SENSITIVE SOILS**

Soils in the resource area are composed of a wide variety of soil types and characteristics. Sensitive soils are those soils that have one or more limiting characteristics that would make them difficult to reclaim, if they were disturbed. Limiting soil chemical features include sodium, soluble salts, carbonates, and gypsum. Limiting soil physical characteristics include soils that are susceptible to wind and/or water erosion, and soils that are protected by biological soil crusts. . Sensitive soils are identified using information from published soil surveys, ecological site descriptions, local monitoring records and field data, and research studies. The information below provides general estimates and descriptions of limiting soil features as determined by the published soil survey information. For the purposes of this analysis, this information was used to identify amounts of soils with limiting features or that could be considered "sensitive soils" within various land management allocations that may differ between alternatives, as a means of comparing impacts to and from soil resources between alternatives. This information may also be used in site specific planning to help determine whether additional BMP's or mitigation measures would be required to protect soil productivity or to improve chances for successful reclamation following disturbance.

**3.14.4.3.1 ERODIBLE SOILS**

Wind erodible soils were determined from each mapping unit's wind erodibility group (WEG), which ranges from 1 (highest erodibility) to 8 (lowest erodibility). Soils with a WEG of 1–2 are highly erodible; soils with a WEG of 3, 4, and 4L are moderately erodible. Wind erosion strips the surface horizon of soil and nutrients necessary for seed germination and plant recruitment. Wind erosion can also result in the formation and expansion of sand dunes. Aeolian deposition can bury and kill biological soil crusts by prohibiting photosynthesis in cyanobacteria, lichens and mosses. In the Monticello PA, moderately and highly wind erodible soils occur over 986,765 acres and 65 acres, respectively (Map 47).

Water erosion causes the formation of rills and gullies, and can contribute to the sedimentation of streams and reservoirs. Two variables were factored into determining a soil's erodibility: the soil's erodibility constant (the "k" factor) and slope. Water erodible soils were divided into 3 classes: slightly, moderately, and highly erodible. The table below summarizes the erodibility constants and slope parameters used to determine the level of erodibility.

Slightly water erodible soils totaled 1,789,629 acres, moderately water erodible soils totaled 8,659 acres, highly water erodible soils totaled 206,451 acres, and (Map 46).

**Table 3.41. Soil Erodibility Factors**

<b>Erodibility</b>	<b>k Factor</b>	<b>Slope</b>
High	>0.37 0.20–0.36	>10% >30%
Moderate	0.20–0.36 <0.20	>10 to ≤30% > 30%
Slight	<0.20 any k-factor	10 to 30% <10%

### **3.14.4.3.2 SALINE AND SODIC SOILS**

Soil salinity can have significant impacts on soil erosion and reclamation potential. Erosion of saline soils can also have significant impacts on the water quality of downstream watersheds. Soil map units with (saline soils) exhibit electrical conductivity levels of 8 decisiemens per meter (dS/m) or greater are shown in Map 44. Sodic soils are those soils with sodium adsorption ratios (SAR) greater than 13:1. The soil survey maps do not indicate that saline or sodic soils occur on BLM lands within the Monticello PA, but they are expected to occur within San Juan County (Maps 44 and 45).

### **3.14.4.3.3 RECLAMATION-SENSITIVE SOILS**

Reclamation sensitive soils are those soils with one or more of the following characteristics that would make them difficult to revegetate if disturbance occurred on them:

- pH  $\geq$  9.0
- SAR  $\geq$  13:1
- Salinity  $\geq$  8 dS/m

As stated above, saline and sodic soils are not likely to occur within the Monticello PA, but there are some strongly alkaline soils present within the PA. Due to the characteristics listed above, reclamation sensitive soils would be difficult to revegetate, due to their limiting soil chemical properties. The Monticello PA contains 286,736 acres of reclamation-sensitive soils (Maps 34, 37, and 38).

### **3.14.4.3.4 BIOLOGICAL SOIL CRUSTS**

Many of the biotic communities found in the Monticello PA have evolved with the presence of biological soil crusts. Biological soil crusts include mats or filaments of cyanobacteria, lichens, and mosses. These crusts play a major role in reducing water and wind erosion and in preventing the establishment of invasive annual grasses (BLM 2001b).

The presence of biological crusts in arid and semiarid lands have a significant influence on reducing soil erosion by both wind and water, fixing atmospheric nitrogen, retaining soil moisture, and providing a living organic surface mulch. They can be used as an indicator of rangelands' ecological health. Development of biological crusts is strongly influenced by soil texture, soil chemistry, and successional colonization by crustal organisms. The SSURGO data and NRCS soil surveys do not contain information on the amounts or types of biological crusts that may occur in each soil mapping unit. However, extensive research on soil biological crusts has been done in nearby areas such as Canyonlands National Park and the Grand Staircase Escalante National Monument (see USGS 2007; Bowker et al. 2006).

### **3.14.5 SURFACE WATER SUPPLY AND USE**

Surface water supply comes from larger regional rivers (Colorado and San Juan rivers), and those intermittent and perennial streams in the Monticello PA that originate in the Abajo

Mountains. Runoff occurs from snowmelt and from brief intense storms that generally occur in late summer. Most of the surface runoff occurs from snowmelt during the months of April, May, and June. Stream segments farther away from the mountains, or with headwaters originating at lower elevations, are less likely to be perennial and more dependent on summer precipitation. Diverted surface water in the FO PA is used for agricultural, municipal, industrial, and recreational purposes.

Major creeks, rivers, and lakes are summarized in Table 3.42. Average annual streamflows for some of the creeks and rivers are included in Table 3.43.

**Table 3.42. Major Waterbodies within the Monticello Planning Area**

Subbasin	Major Waterbodies
Upper Colorado – Dolores – Kane Springs	Colorado River, Indian Creek
Upper Colorado – Dirty Devil – Upper Lake Powell	Colorado River, Lake Powell
Lower San Juan – Four Corners	San Juan River, Butler Wash, Comb Wash, Recapture Creek, Recapture Reservoir, Blanding City Reservoirs
Lower San Juan – Montezuma	Vega Creek, Verdure Creek, Montezuma Creek, Keller Reservoir, Lloyd's Lake
Lower San Juan – Lower San Juan	San Juan River, Lime Creek, Lake Powell

**Table 3.43. Annual Mean Streamflow of Selected Waterbodies**

Major Waterbodies	Flow Regime	Avg. Annual Streamflow (cfs) <sup>1</sup>	Period of Record
Colorado River	Perennial	12,500	1928–1982
Indian Creek	Perennial	4.2	1950–1990
Montezuma Creek	Intermittent	11.8	1986–1992
Recapture Creek	Intermittent	1.3	1966–2001
San Juan River	Perennial	2,300	1915–2001

<sup>1</sup> Based on published USGS data (USGS 2006).

The largest use of surface water is for agricultural irrigation for approximately 5,100 acres of land, diverting an average of 17,000 acre-feet annually. Of this diversion, approximately 9,700 acre-feet are depleted through evapotranspiration with the rest returning to the hydrologic system as runoff or infiltration. These numbers are based on data compiled for a region roughly equivalent to the PA for the year 1996 (UDWRe 2000).

Municipal and industrial (M&I) surface water use in San Juan County accounted for diversions of approximately 3,500 acre-feet in 1996 (UDWRe 2000). Industrial water uses in San Juan County account for approximately 30% of the M&I diversions and include mining and mineral processing, lumber processing, construction and rock products, and meat processing.

Intermittent and perennial surface water flow also provides the basis for wet and open areas and supports riparian vegetation. BLM surface water developments include stock ponds, erosion control structures, rainfall catchments, guzzlers for wildlife, and spring developments.

There is no irrigated agriculture associated with BLM lands within the Monticello PA, with the exception of minor acreage being farmed in trespass.

### 3.14.6 MUNICIPAL WATERSHEDS

Some municipalities within the PA rely on surface water as part of their water supply, with some parts of the watershed administered by the BLM. Most of the culinary water supplied by Blanding is surface water from Indian, Johnson, and Recapture creeks, and all of the culinary water supplied by Mexican Hat is surface water from the San Juan River. Culinary or potable water supplied by Bluff, Eastland, Monticello, and the San Juan Special Services District all originates as groundwater derived from springs or wells.

Forty-five parcels within the PA have been withdrawn by the BLM for public water preservation. These lands total approximately 3,800 acres, and are summarized in Table 3.44.

**Table 3.44. Summary of BLM Public Water Reserve Lands**

Parcel	Acres
Alkali Canyon (2)	82.64
	78.75
Arch Canyon	85.64
Cigarette Spring Cave	155.14
Collins Spring (2)	87.35
	103.61
Cottonwood Wash (3)	38.03
	39.28
	35.46
Cross Canyon (3)	40.50
	39.31
	40.10
Dark Canyon	41.04
Dry Wash	43.90
East Canyon Wash (2)	35.43
	83.74
Irish Green Spring (3)	120.70
	38.51
	40.15
Lime Creek (4)	72.42
	40.21

**Table 3.44. Summary of BLM Public Water Reserve Lands**

<b>Parcel</b>	<b>Acres</b>
	38.59
	40.79
Mike's Canyon (2)	151.45
	243.93
Peter's Canyon	41.30
Picket Fork	159.75
Prehistoric Cave Spring	155.84
Recapture Creek (3)	20.38
	43.70
	37.15
Red House Spring	239.56
Ruin Canyon (2)	73.22
	222.76
San Juan River (2)	41.10
	35.11
Sweet Alice Spring	40.24
Tank Wash	20.27
The Needles	186.10
The Tank	124.09
Turner Water Canyon (2)	156.44
	40.53
Wild Cow Point (2)	44.58
	138.61
Woodenshoe Buttes	157.50
<b>Total</b>	<b>3,794.9</b>

### **3.14.7 SURFACE WATER QUALITY**

The U.S. Geological Survey (USGS), the BLM, and the UDEQ implement surface water quality sampling programs within the Monticello PA. The USGS sampling program regularly monitors only the major rivers within the PA including the Colorado and San Juan rivers. The USGS monitoring program has been continuously conducted for more than 60 years. The UDEQ and BLM sampling programs support state water quality assessments and are more extensive, including many of the smaller creeks, springs, and lakes. The UDEQ sampling program was started in 1997 as the basis for Utah's water quality assessment required under Section 305(b) of the Clean Water Act, and the Section 303(d) list of impaired water bodies.

Impaired water bodies within the Monticello PA were limited to the Kane Springs and Lower San Juan subbasins. Within the Kane Springs subbasin, Indian Creek was identified as impaired with respect to pH. Within the Lower San Juan subbasin, Johnson Creek and North Creek are

impaired with respect to pH, and Cottonwood Wash is impaired due to radionuclides (gross alpha) due to historical mining and mine tailings in the area. Within the Lower San Juan subbasin, Recapture Reservoir is impaired with respect to dissolved oxygen.

A full list of streams and water bodies located within the Monticello PA and listed on Utah's 303(d) list are included as Table 3.45, and shown in Map 48.

**Table 3.45. Waterbodies on Utah's 303(d) List of Impaired Waters**

HUC Code	Name	Stressor
14030005	Indian Creek from Newspaper Rock north boundary to headwaters	pH
14080201	Johnson Creek from Recapture Creek to headwaters	pH
14080201	Cottonwood Wash from Westwater to USFS Boundary	Gross alpha <sup>4</sup>
14080201	Cottonwood Wash within FS Boundary	Gross alpha
14080203	North Creek from Montezuma Creek to headwaters	pH
14080201	Recapture Reservoir	Dissolved Oxygen

Source: UDEQ 2000a, UDEQ 2002.

Excess salinity is the major surface water quality problem in the PA, and is of national significance under the Colorado River Basin Salinity Control Act of 1974. Salinity contributions occur from naturally occurring saline springs, from saline groundwater interception by streams, and from erosion of saline soils. During low flow periods, salt contribution comes from seeps, springs, and groundwater flow; during high flow periods, erosion of saline soils becomes a major contributor to salinity problems.

Based on the UDEQ sampling program, problem watersheds within the Monticello PA have been identified and are summarized in Table 3.46. Two parameters can be used to describe salinity impacts from each watershed: total dissolved solids, which are reflective of saline groundwater contribution as well as erosion of saline soils; and total suspended solids, which are an indicator or erosion potential of a watershed. Other stream systems within the Monticello PA may also have problems, but the data are not currently available to make this assessment.

**Table 3.46. Watersheds with Potential High Salinity Contributions**

Subbasin/Stream System Sampling Locations	Average Total Dissolved Solids (mg/L)	Average Total Suspended Solids (mg/L)	Percent of Time TDS Limit Exceeded <sup>1</sup>	Percent of Time TSS Limit Exceeded <sup>2</sup>	Approximate Percent of Watershed on BLM Lands
<b>Lower San Juan/Lime Creek</b>					<b>90</b>
Lime Creek (mouth)	2,750	20	92	8	
<b>Four Corners/Comb Wash</b>					<b>80</b>
Comb Wash (mouth)	1,300	900	44	56	
Comb Wash (middle)	1,970	190	50	8	
Arch Creek	690	280	0	19	

<sup>4</sup> Gross Alpha is a radioactive contaminant sometimes found in water within or adjacent to historic mining districts.

**Table 3.46. Watersheds with Potential High Salinity Contributions**

Subbasin/Stream System Sampling Locations	Average Total Dissolved Solids (mg/L)	Average Total Suspended Solids (mg/L)	Percent of Time TDS Limit Exceeded <sup>1</sup>	Percent of Time TSS Limit Exceeded <sup>2</sup>	Approximate Percent of Watershed on BLM Lands
Fish Creek	1,910	20	69	8	
<b>Four Corners/Cottonwood Creek</b>					<b>45</b>
Cottonwood Creek (mouth)	340	3,240	0	60	
Cottonwood Creek (middle)	330	1,010	0	38	
Cottonwood Creek (headwaters)	320	560	0	50	
Allen Canyon Creek	340	100	0	17	
Hammond Canyon Creek	310	250	0	25	
<b>Four Corners/Recapture Creek</b>					<b>45</b>
Recapture Creek (mouth)	1,440	1,840	45	64	
Bulldog Canyon Creek	410	180	0	15	
<b>Montezuma/Montezuma Creek</b>					<b>40</b>
Montezuma Creek (mouth)	1,400	1,750	64	100	
Montezuma Creek (headwaters)	780	310	0	20	
<b>Kane Springs/Salt Creek</b>					<b>25</b>
Salt Creek (mouth)	4,350	10	100	0	
Salt Creek (middle)	720	30	5	6	
<b>Kane Springs/Indian Creek</b>					<b>55</b>
Indian Creek (headwaters)	210	890	0	25	
North Cottonwood Creek	320	140	0	35	

Source: USEPA 2003d.

<sup>1</sup> Exceedance over 1,200 mg/L.<sup>2</sup> Exceedance over 90 mg/L.

### 3.15 SPECIAL DESIGNATIONS

For the purposes of this analysis, Special Designations fall into 3 categories: Areas of Critical Environmental Concern (ACECs), Wild and Scenic Rivers (WSR), and Wilderness Study Areas (WSAs). (There is no designated wilderness within the Monticello PA). Special designations are applied to areas when they have certain resources or characteristics that require special management. Detailed descriptions of each of these areas and the criteria for proposing them are given below. Area of Critical Environmental Concern (ACEC)

#### 3.15.1.1 INTRODUCTION

FLPMA defines an ACEC as an area "within the public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life and safety from natural hazards." Private lands and lands administered by other agencies are not included in the boundaries of ACECs.

FLPMA states that the BLM will give priority to the designation and protection of ACECs in the development and revision of land-use plans (43 United States Code [U.S.C.] 1712 [c]).

Regulations at 43 CFR 1610.7-2 require that for an area to be considered as a potential ACEC, both of the following criteria shall be met: 1) Relevance—there shall be present a significant historic, cultural or scenic value; a fish or wildlife resource or other natural system or process; or a natural hazard; and 2) Importance—the above described value, resource, system, process, or natural hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequences, meaning, distinctiveness, or cause for concern.

ACECs differ from some other special management designations in that designation by itself does not automatically prohibit or restrict other uses in the area. The special management attention is designed specifically for the relevant and important values, and therefore varies from area to area. The one exception is that a mining plan of operation is required for any proposed mining activity that would create surface disturbance greater than casual use within a designated ACEC (43 CFR 3809 Regulations).

The first step in the ACEC designation process is a call for nominations during public scoping for the RMP. The BLM, other federal and state agencies, special-interest groups, or members of the public may formally nominate an area for ACEC designation. The nominations are reviewed by a BLM interdisciplinary team to determine if the criteria of relevance and importance have been met. In addition, existing ACECs are subject to reconsideration when plans are revised.

If the relevance and importance criteria are met, the area is considered as a potential ACEC to be considered for ACEC designation during the RMP planning process or during the RMP amendment process. The signing of the ROD of the proposed RMP or RMP amendment by the

BLM state director officially designates an ACEC. Following ACEC designation, special management identified in the RMP or RMP amendment is implemented.

### 3.15.1.2 REGIONAL OVERVIEW

The Monticello PA has 10 existing ACECs that were reconsidered during the RMP process for relevance and importance values along with a total of nine new internal and external nominations. Several of the new nominations overlapped existing ACECs. The determination rationale for all existing ACECs and new nominations, including those that did not meet relevance and importance criteria, are outlined in Appendix H, Special Designations, Relevance and Importance Criteria Evaluations.

### 3.15.1.3 EXISTING ACECS

With the approval of the San Juan RMP (BLM 1991a), the BLM designated 10 ACECs, comprising approximately 513,452 acres, in the Monticello PA. These areas are recognized as requiring special management attention for the protection of cultural sites, scenic qualities, recreational opportunities, vegetation, or wildlife resources. With the exception of the Grand Gulch Plateau Cultural and Recreation Management Plan (BLM 1993c), separate management plans have not been developed for these ACECs. Instead, the special management conditions (from the 1991 San Juan RMP), direct how the existing ACECs are managed. When a project is allowed to proceed within an ACEC, these established management conditions must be followed, and are incorporated directly into the management prescription for the proposed project. The 10 existing ACECs are summarized in Table 3.47. Please see Map 50 for their locations.

**Table 3.47. Monticello PA ACECs from 1991 RMP (Existing ACECs)**

Existing ACECs	Value(s)	1991 RMP Acreage <sup>1</sup>	Existing ACEC Mapped Acreage per ArcView <sup>2</sup>
Alkali Ridge	Cultural	35,890	39,202
Bridger Jack Mesa	Near-relict Vegetation	5,290	6,260
Butler Wash	Scenic	13,870	17,463
Cedar Mesa	Cultural, Scenic	323,760	295,335
Dark Canyon	Scenic	62,040	61,659
Hovenweep	Cultural, Habitat Management	1,500	1,798
Indian Creek	Scenic	8,640	8,509
Lavender Mesa	Relict Vegetation	640	649
Scenic Highway Corridor	Scenic	78,390	79,017
Shay Canyon	Cultural and Special Emphasis Area	1,770	3,560
<b>Total</b>		<b>531,790</b>	<b>513,452</b>

<sup>1</sup>Acreage listed in 1991 San Juan RMP (BLM 1991a).

<sup>2</sup>Acreage for current existing ACECs determined by ArcView program. Difference represents mapping/GIS discrepancy.

**3.15.1.4 POTENTIAL ACECs**

After analyzing both currently existing and nominated areas based on relevance and importance criteria for the purpose of ensuring "that the most environmentally important and fragile lands will be given ... early attention and protection." (Senate Report 94-583, on FLPMA), and to protect important resources from irreparable damage, the BLM identified 11 potential ACECs, totaling 535,936 acres within the boundaries of the Monticello PA (Table 3.48–3.50; Map 51). It should be noted that some of these are existing ACECs, and some are new nominations for designation as ACECs. In addition, some of these potential ACECs are reconfigurations of existing and nominated areas.

Portions of potential and/or existing ACECs are within existing WSAs. Table 3.49 shows the acreage of WSA that is within an ACEC. Those ACECs that are not listed have no acres of WSA within the ACEC.

For detailed information on the Monticello FO ACEC process please refer to ACEC Evaluations, Appendix H.

**Table 3.48. Summary Table of Potential ACECs**

Area Name	Value(s)	Acreage
Alkali Ridge	Cultural	39,202
Bridger Jack Mesa	Near-relict vegetation	6,225
Butler Wash North	Scenic	17,463
Cedar Mesa	Cultural and Scenic, with Special Emphasis Areas—Grand Gulch, Valley of the Gods, and Arch Canyon, and Pine/Step Canyon area	344,262
Dark Canyon	Scenic, Cultural and Wildlife	61,659
Hovenweep	Cultural with Special Wildlife Habitat	2,438
Indian Creek/ Lockhart Basin	Scenic	56,293 <sup>1</sup>
Lavender Mesa	Relict-vegetation	649
Shay Canyon	Cultural	119
San Juan River	Scenic, Cultural, Wildlife and Natural System	7,626
Valley of the Gods	Scenic	-- <sup>2</sup>
<b>Total</b>		535,936

<sup>1</sup> Indian Creek: 8,509 acres, included within Lockhart Basin total.

<sup>2</sup> Valley of the Gods: 34,771 acres, included in Cedar Mesa total.

**Table 3.49. ACEC Acreage within Wilderness Study Areas (WSAs), by ACEC**

Potential ACEC	Total ACEC Acreage	WSA(s) within the ACEC	Acreage of WSA within the ACEC	Percent of ACEC within WSA
Bridger Jack Mesa	6,225	Bridger Jack Mesa	6,225	100%

**Table 3.49. ACEC Acreage within Wilderness Study Areas (WSAs), by ACEC**

Potential ACEC	Total ACEC Acreage	WSA(s) within the ACEC	Acreage of WSA within the ACEC	Percent of ACEC within WSA
Butler Wash	17,463	Butler Wash, South Needles	17,248	99%
Cedar Mesa	344,262	Fish Creek Canyon, Bullet Canyon, Pine Canyon, Shieks Flat, Grand Gulch ISA, Mule Canyon, Road Canyon	196,349	57%
Dark Canyon	61,659	Dark Canyon ISA	61,326	99%
Indian Creek	8,509	Indian Creek	4,602	54%
Lockhart Basin	47,784	Indian Creek	1,821	4%
Scenic Highway Corridor	79,017	Cheese Box Canyon, Fish Creek Canyon, Pine Canyon, Shieks Flat, Grand Gulch ISA, Mule Canyon, Road Canyon	9,929	8%

**Table 3.50. Description and Relevance and Importance Summary of Potential ACECs**

Description	Summary of Relevance and Importance
<b>Alkali Ridge Existing ACEC—39,202 acres</b>	
Alkali Ridge lies between Alkali Canyon and Montezuma Canyon in the eastern portion of the resource area. This area is one of the best-known and influential examples of scientific archeological investigation in the southwestern U.S. The area contains the Alkali Ridge National Historic Landmark (2,340 acres).	The cultural resources located in this area are regionally and nationally significant and include a large number of high density cultural sites of the Basketmaker and Pueblo cultures. This area contains numerous large structural sites that have revealed evidence of the full range of prehistoric pueblo occupation from Basketmaker II to Pueblo III (500–1300 AD) and represent the defining morphological site type for the prehistoric Pueblo II cultural period (900–1150 AD).
<b>Bridger Jack Mesa Existing ACEC—6,225 acres</b>	
Bridger Jack Mesa is located in the Indian Creek Corridor on the west side of Scenic Highway 211. Bridger Jack Mesa ACEC covers a large mesa top consisting of pinyon-juniper woodland and sagebrush-grass parks. The mesa is public land except for approximately 420 acres of state land.	This area contains near-relict plant community unaltered by human intervention. The cliffs surrounding the mesa top form a natural boundary providing a relatively isolated area that has not been grazed since 1957. Bridger Jack Mesa provides a natural exclosure control area to study the recovery of pinyon-juniper woodland and sagebrush-grass communities from livestock grazing. It is important as a baseline for the study and comparison of pinyon-juniper woodlands and sagebrush-grass community management in other parts of the Colorado Plateau and is, therefore, more than locally significant.

**Table 3.50. Description and Relevance and Importance Summary of Potential ACECs**

Description	Summary of Relevance and Importance
<b>Butler Wash Existing ACEC—17,463 acres</b>	
Butler Wash North ACEC is located south of and adjacent to Canyonlands National Park, and includes Butler Wash, and several forks of Salt Creek. The southern part of the ACEC flat areas drop abruptly into the heads of the various forks of Salt Creek.	The scenic values of this area are a continuation of the remarkable rock formations, spires, domes and buttes seen in the adjacent Needles District of Canyonlands National Park. They are important to regional, national, and international visitors who travel to Canyonlands NP and backpack into the remote, natural areas adjacent to the park. Salt Creek is one such area. Gray, cream, coral and red sandstones band the walls of the canyons of Salt Creek.
<b>Cedar Mesa Existing ACEC—295,335 (Includes 4,240 acres in Grand Gulch, and 34,771 in Valley of the Gods)</b>	
Cedar Mesa ACEC is located on the southern boundary of the field office bounded by Comb Wash on the east, Highway 163 and Glen Canyon NRA on the south and State Highway 276 on the west. This ACEC encompasses the Grand Gulch Archeological District and the Grand Gulch Primitive Area.	Cultural resources in the Cedar Mesa/Grand Gulch area are of regional, national, and worldwide significance because of the wealth of intact Basketmaker and Pueblo cliff dwellings in excellent condition. Arch Canyon, in particular, has a ruin of unique architectural elements that are one-of-a-kind in this area.  Arch Canyon also has designated critical habitat for the Mexican Spotted Owl, potential habitat for the Southwestern Willow Flycatcher, and riparian habitat essential for amphibians and neo-tropical migratory birds. Sensitive fish species such as the flannelmouth sucker are present in the canyon.
<b>Dark Canyon Existing ACEC—62,659 acres</b>	
Dark Canyon ACEC is located on the western boundary of the field office adjacent to Glen Canyon NRA on the west, and on the east the Dark Canyon Wilderness Area (45,000 acres) of the Manti-La Sal NF  Dark Canyon ACEC is surrounded by National Forest and NPS lands. This area is primitive, roadless and undeveloped in nature. It is limited to access due to the canyon rims that form a natural boundary that protect its natural scenery and wildlife values. The area includes Dark, Gypsum, and Fable Valley and several smaller side canyons all of which are part of the Colorado River drainage.	Dark Canyon is one of the deepest canyon systems in the region. The remote location, dramatic rugged terrain, and undeveloped naturalness of the area contribute to the high scenic value and make this a destination for primitive backcountry exploration by national and international travelers. The canyon has unobstructed and expansive views including 1,200 foot vertical cliffs, rimrock, outcrops and spires, pour-offs and potholes, and color contrasts between soil and rock, flowing water, and diverse vegetation. The proximity to Glen Canyon NRA, the Colorado River, Canyonlands NP, and the Manti-La Sal National Forest contribute to Dark Canyon as a visitation destination for primitive backcountry experience.  Dark Canyon is within designated critical habitat for the Mexican Spotted Owl. It is also important habitat for Willow Flycatchers, Peregrine Falcon, and other raptors. There is a large variety of wildlife present in the area including ringtail cats, desert bighorn sheep, bobcats, black bear, deer, elk, and mountain lions.

**Table 3.50. Description and Relevance and Importance Summary of Potential ACECs**

Description	Summary of Relevance and Importance
<b>Hovenweep Existing ACEC—1798 acres + 620 acres<sup>1</sup></b>	
<p>Hovenweep ACEC is located on the eastern boundary of the field office and is adjacent to the Square Tower Unit in Hovenweep National Monument (NPS).</p>	<p>Hovenweep ACEC contains cultural resources in the same vicinity and of the same types as Canyons of the Ancients National Monument and Hovenweep National Monument and adds cohesiveness to the management of the cultural resources of the two National Monuments.</p> <p>It has two special emphasis areas, Cajon Pond and a visual protection zone (880 acres) for the unobstructed viewing of cultural sites. Cajon Pond, a constructed reservoir covers approximately 10 acres and provides important riparian habitat for migrating waterfowl and other wildlife in a desert, semiarid climate that has very little surface water present.</p>
<b>Indian Creek Existing ACEC—8,509 acres</b>	
<p>Indian Creek ACEC is located in the northern area of the FO, east of and adjacent to Canyonlands NP / Needles District. The Indian Creek ACEC buffers the scenic view from Needles Overlook across BLM land into Canyonlands NP. The area includes the lower end of Indian Creek and Rustler Canyon.</p>	<p>The Indian Creek ACEC is noted for its incised, meandering canyons that wind through dark red mudstones, forming many rounded spires, and "hoo-doo" (boulders atop eroded rock that look like mushrooms). These various formations continue uninterrupted into Canyonlands NP, which contains some of the most unique landforms in the world. Visitors from around the world come to view this area from overlooks across BLM land and NPS Canyonlands NP.</p>
<b>Lavender Mesa Existing ACEC—649 acres</b>	
<p>Lavender Mesa ACEC covers the top of Lavender Mesa, which is located in the Indian Creek corridor of the FO.</p> <p>Lavender Mesa is isolated and inaccessible to man and herbivores by ground routes, even small mammals such as rabbits and mice appear to be absent. The mesa top supports a relict plant community environment. Most of the mesa is pinyon-juniper woodland with the exception of a small 20-acre sagebrush-grass park.</p>	<p>The vegetative community present on the top of Lavender Mesa is unique because it has developed without the influence of grazing animals and most other mammals. The area is ecologically relevant because it presents an isolated, relict plant community that remains unaltered by human or animal intervention. The vegetative community is important as a baseline for comparative studies of pinyon-juniper woodland and sagebrush-grass communities in other parts of the Colorado Plateau.</p>
<b>Shay Canyon Potential ACEC—119 acres</b>	
<p>Shay Canyon ACEC is located in the southern portion of the Indian Creek corridor and is adjacent to the northern boundary of the Manti-La Sal National Forest. It includes sections of the upper Indian Creek drainage with a Special Emphasis Area for the protection of aquatic and riparian habitat, delineated as a 275-foot corridor along upper Indian Creek.</p>	<p>Cultural resources in this area represent the interface between two prehistoric cultural groups: Anasazi and Fremont. This interface is represented in the unique motifs in the rock art. The area provides an opportunity for cultural scientific research, and paleontology study. Dinosaur tracks in the bottom of the Shay Canyon streambed are a unique visual reminder of the area's distant geologic and natural past.</p> <p>This area is heavily traveled area by visitors to the Needles District of Canyonlands National Park as Route 211 is the only way into and out of the park.</p>

**Table 3.50. Description and Relevance and Importance Summary of Potential ACECs**

Description	Summary of Relevance and Importance
<b>Lockhart Basin Potential ACEC—56,293 acres</b>	
<p>The Lockhart Basin ACEC nomination area is bounded on the north by the Colorado River, on the east by the cliffs of Hatch Point [the Moab and Monticello FOs boundary], and on the west by Canyonlands National Park. The southern boundary contours from the eastern rims to south of Indian Creek Existing ACEC and west to the boundary of Canyonlands National Park.</p> <p>This ACEC nomination includes lower Indian Creek, Rustler, Horsethief, and Lockhart Canyons and is nominated to protect scenic values as viewed from the numerous rims above the eastern ACEC nominated boundary, and looking into Canyonlands National Park.</p>	<p>The visual resources of the Lockhart Basin ACEC are some of the most impressive of the entire Colorado Plateau, and are of local, national, and international significance.</p> <p>The overlooks from the Needles Overlook provide an extensive viewshed of miles of vistas looking deep into Canyonlands NP. The unique characteristics of landforms, the National Park, the relative pristine nature of the land, the sensitivity of visitors to scenic resources, and the ability of the visitor to view the area from many vantage points make this an extraordinary and important visual resource.</p> <p>The cultural inventory areas within Lockhart Basin indicate multi-cultural occupations, unique to the canyonlands area of Utah.</p>
<b>Valley of the Gods Potential ACEC—34,771 acres</b>	
<p>Valley of the Gods lies north of US Highway 163 extending north to the south cliff line of Cedar Mesa. The Valley of the Gods is currently a Special Emphasis Area within the existing Cedar Mesa ACEC.</p>	<p>Valley of the Gods provides significant vistas to those who travel the roads surrounding the area. The Valley of the Gods is important to regional, national and international visitors who view and photograph the scenery. Panoramic views can be seen from the highways bordering the area and from the Valley of the Gods Loop (graded gravel and clay, 17 miles) Road. The eroded, wind-sculpted spires and buttes, and long rock fins resemble animals or "gods." Seven Sailors, Rooster Butte, Setting Hen Butte, Pyramid Peak, Castle Butte, and Bell Butte are found here. The West Fork of Lime Creek, Lime Creek, and the northwest portion of Lime Ridge are included in t area.</p>
<b>San Juan River Potential ACEC—7,626 acres</b>	
<p>The San Juan River ACEC nomination is located along the river from west of Bluff, Utah to the boundary of Glen Canyon NRS, with the Navajo Nation on the southern portion of the river center-line. A portion of the nominated area lies within the San Juan River SRMA.</p>	<p>The scenery along the San Juan River includes tilted formations as the river crosses Comb Ridge, steep vertical cliffs hundreds of feet high with walls of interbedded sandstone and limestone, and the 1,200-foot high walls of the Goosenecks. The Goosenecks are one of the best examples of entrenched meanders in the U.S. Riparian areas with various hues of green border the watercourse and contrast with red sandstone, presenting a diverse and varied scenic viewing area. Hanging gardens occur in ledges of Navajo Sandstone.</p> <p>The rock art along the San Juan River is unsurpassed, recognized as "Type Sites" for their specific rock art motifs. Cultural sites are present along the river banks and within the tributaries of the San Juan River.</p> <p>The San Juan River has a unique endemic fish population and designated habitat for the endangered Colorado pikeminnow and the razorback sucker, as well as the state sensitive</p>

**Table 3.50. Description and Relevance and Importance Summary of Potential ACECs**

Description	Summary of Relevance and Importance
	flannelmouth sucker. Bighorn sheep inhabit the rocky precipices of the lower river. The river corridor is used by migrating Southwestern Willow Flycatcher (a T&E species), and Yellow-billed Cuckoo (a candidate species). The San Juan River supports riparian habitat for several other species of wildlife, including amphibians, neo-tropical birds, and waterfowl.

<sup>1</sup>Since the designation of this ACEC in the 1991 San Juan RMP (BLM 1991a), the BLM has acquired an additional parcel of land, approximately 620+ acres, that is adjacent on the east of the BLM Hovenweep ACEC and a state section, and is also on the western boundary of the Canyon of the Ancients NM (COANM) in Colorado. It is proposed that this parcel of approximately 620+ acres be added to the current BLM Hovenweep ACEC. The additional acreage will fill in a previously privately owned parcel between the two national monuments and contribute to consistent management of the cultural value.

### **3.15.2 WILD AND SCENIC RIVERS**

#### **3.15.2.1 INTRODUCTION**

The Wild and Scenic Rivers Act, 1968 established legislation for a National Wild and Scenic Rivers System (NWSRS) to protect and preserve designated rivers throughout the nation in their free-flowing condition, as well as their immediate environments. The Act contains policy for managing designated rivers, and created processes for designating additional rivers into the National System. Section 5(d) of the Act directs federal agencies to consider the potential for national wild, scenic and recreational river areas in all land and water development planning. A WSR review is being conducted as part of the current BLM Monticello FO RMP process.

The first phase of the WSR review is to inventory all potentially eligible rivers within the FO area to determine which of those rivers are eligible for consideration in the NWSRS. In order to be eligible, rivers must be free-flowing and possess at least one ORV. The ORVs are evaluated in the context of regional and/or national significance, and must be river-related. A tentative classification of each river/segment found eligible is then made based on the current level of human development associated with that river/segment.

The second phase of the WSR review occurs as all eligible rivers are taken through the land-use planning process of the RMP to determine their "suitability" for designation into the NWSRS. Suitability is discussed in Chapter 4 of the Draft EIS. One RMP planning alternative will consider all eligible river(s)/segments as suitable, another alternative will consider no eligible river(s)/segments as suitable, and other alternatives will consider some river(s)/segments as suitable and other river(s)/ segments not suitable. "Suitability" determinations will be made in the ROD for the RMP.

Those river(s)/segments found suitable are then managed under specified guidelines to protect the free-flowing nature of the river(s)/segment, and to protect the identified ORVs and tentative classification.

Finally, the "suitable" river/segment determinations are reported to Congress. There is no specific time requirement for the completion of this phase; however, it is assumed that reporting

will be done some time following completion of the RMP. Only the U.S. Congress or the Secretary of the Interior, upon request by the state, can designate a river into the NWSRS.

### 3.15.2.2 ELIGIBLE SEGMENTS

Approximately 1,300 miles of watercourses within the Monticello PA were inventoried and determined to be free-flowing. Each river segment was evaluated on the basis of having at least one river-related ORV considered rare, unique and/or exemplary, with each ORV being at least regionally significant, and having perennial or intermittent flows. Within the Monticello PA, 12 segments totaling approximately 93 miles on 6 rivers were found to meet these criteria (see Map 54). A table listing all of the 167 river segments evaluated in 2003–2004 by the ID team for potential WSR eligibility is available in the *Preliminary Eligibility Determination of Wild and Scenic Rivers* (BLM 2003d). A tentative classification of Wild, Scenic, or Recreational was determined for each eligible river/segment based on the level of human development associated with each river/segment.

- A *Wild* river is free of impoundments, with shorelines or watersheds essentially primitive, and with unpolluted waters.
- A *Scenic* river may have some development, and may be accessible in places by roads.
- A *Recreational* river is considered as a river or segment of river accessible by road (or railroad), may have more extensive development along its shoreline, and may have undergone some impoundment or diversion in the past.

Table 3.51 lists and describes the ORVs of each of the 12 eligible river segments that will be further reviewed for suitability.

Detailed descriptions of the ORVs and the eligibility determinations can be found in the Monticello FO Final Eligibility Report (BLM 2004c). The tentative Classification for each river segment is included in the table, as well as descriptions of the ORVs. Individual worksheets showing evaluation for Tentative Classifications of each river segment are found in Appendix H, Special Designations.

**Table 3.51. Individual Eligible Wild and Scenic River(s) Segments (see Map 54)**

Segment Description with Approximate River Miles	Length in Total River Miles/BLM River Miles	ORVs	Tentative Classification <sup>1</sup>
<b>COLORADO RIVER</b> Perennial river			
The north/west side of this section of the Colorado River is managed by the BLM Moab Field Office; the south/east side of the same section of river is managed by the BLM Monticello Office. The boundary of the two resource areas is the centerline of the Colorado River.			
Segment 1: Northern FO boundary near River Mile 50.5 on the east side of the river [1 mile north of Potash land] south to private land near River Mile 48.5	6.2 total miles/ 2.2 BLM miles	Scenic Fish Recreation Wildlife Cultural Ecological	Recreational
Segment 2: State lands near	6.8 total miles/	Scenic	Scenic

**Table 3.51. Individual Eligible Wild and Scenic River(s) Segments (see Map 54)**

<b>Segment Description with Approximate River Miles</b>	<b>Length in Total River Miles/BLM River Miles</b>	<b>ORVs</b>	<b>Tentative Classification<sup>1</sup></b>
River Mile 44 to approx. River Mile 38.5	5.5 BLM miles	Fish Recreation Wildlife Cultural Ecological	
Segment 3: River Mile 37.5 west of state school section to boundary of Canyonlands NP near River Mile 31	6.5 total miles/ 6.5 BLM miles	Scenic Fish Recreation Wildlife Cultural Ecological	Scenic
<b>INDIAN CREEK</b>			
Perennial stream from National Forest boundary to Shay Canyon, and intermittent stream from Shay Canyon to Donnelly Canyon			
Manti-La Sal National Forest Boundary to Donnelley Canyon	6.5 total miles/ 4.8 BLM miles	Cultural	Recreational
<b>FABLE VALLEY</b>			
Perennial stream			
Source to Mouth	6.8 total miles/ 6.8 BLM miles	Wildlife Ecological	Scenic
<b>DARK CANYON</b>			
Perennial stream			
Youngs Canyon to Glen Canyon National Recreational Area	13.6 total miles/ 6.4 BLM miles	Scenic Recreation Wildlife	Wild
<b>SAN JUAN RIVER</b>			
Perennial river			
The north side of the San Juan is under BLM Monticello FO management. The south side falls under the jurisdiction and administration of the Navajo Nation. The boundary between Navajo Nation and the Monticello FO is the centerline of the San Juan River.			
Segment 1: West Montezuma Creek to private land just before "avulsed" parcel of Navajo Nation land at St. Christopher's Mission	15.3 total miles/ 8.5 BLM miles	Fish Wildlife Cultural/Historic	Recreational
Segment 2: West of "accreted" land at town of Bluff, UT River Mile (minus) -1 to River Mile 9	10 total miles/ 10 BLM miles	Fish Recreation Wildlife Cultural/Historic Ecological	Recreational
Segment 3: River Mile 9 to near River Mile 23, above the Mexican Hat formation	13.3 total miles/ 13.3 BLM miles	Scenic Fish Recreation Geologic Wildlife Ecological	Wild

**Table 3.51. Individual Eligible Wild and Scenic River(s) Segments (see Map 54)**

<b>Segment Description with Approximate River Miles</b>	<b>Length in Total River Miles/BLM River Miles</b>	<b>ORVs</b>	<b>Tentative Classification<sup>1</sup></b>
Segment 4: River Mile 23 to near River Mile 28	5.3 total miles/ 4.2 BLM miles	Scenic Fish Recreation Wildlife Ecological	Recreational
Segment 5: River Mile 28 to boundary of Glen Canyon NRA near River Mile 45	17.3 total miles/ 17.3 BLM miles	Scenic Fish Recreation Geologic Wildlife Ecological	Wild
<b>ARCH CANYON</b> Perennial stream in some reaches, Intermittent stream in others.			
Manti-La Sal National Forest Boundary to ½ mile west of its confluence with Comb Wash	7.7 total miles/ 6.9 BLM miles	Fish Recreation Wildlife Cultural Ecological	Recreational

<sup>1</sup> See appendix.

### **3.15.3 LANDS STUDIED FOR CONGRESSIONAL WILDERNESS DESIGNATION UNDER FLPMA SECTION 603**

#### **3.15.3.1 BACKGROUND AND HISTORY**

In 1964, Congress passed the Wilderness Act, establishing a national system of lands for the purpose of preserving a representative sample of ecosystems in a natural condition for benefit of future generations. Until 1976, lands considered for and designated as wilderness were managed by the USFS, the USFWS, or the NPS. With the passage of the FLPMA in 1976, Congress directed the BLM to inventory; study, and recommend which public lands under its administration should be designated as wilderness.

In 1979, the BLM began an inventory of 23 million acres of public land in Utah and determined that 95 areas (approximately 3.3 million acres) possessed wilderness character. These lands are called wilderness study areas (WSAs) or instant study areas (ISAs) if they had previously been identified as outstanding natural areas or primitive areas. For the next several years, these areas were studied to determine which would be recommended to Congress for designation as wilderness. In October 1991, the Secretary of the Interior recommended that Congress designate 69 areas, totaling about two million acres as wilderness. To date, with few exceptions, Congress has not acted on that recommendation.

WSAs are roadless, natural in appearance, provide outstanding opportunities for solitude or primitive and unconfined recreation, and may have supplemental values (such as ecological, geological, or other features of scientific, educational, scenic, or historical value).

### 3.15.3.2 PLANNING AREA PROFILE

There are 18 WSAs or ISAs in the Monticello PA (Table 3.52 and Map 56). As depicted on the table, some of the WSAs are combined with the Grand Gulch and Dark Canyon ISAs to create 2 ISA complexes. Within the area managed by the Monticello FO, there is also an area totaling 2,160 acres contiguous to the Butler Wash WSA (and included in the Butler Wash WSA acreage), that was studied as a boundary variation during the wilderness review mandated by Congress in FLPMA Sections 603(a) and (b). These lands were addressed in the Utah BLM Statewide Wilderness Final EIS (November, 1990) and were recommended for congressional wilderness designation in the Utah Statewide Wilderness Study Reports (October, 1991). This recommendation was forwarded by the President of the U.S. to Congress in 1993.

All the lands studied during the FLPMA Section 603 wilderness review will continue to be managed in a manner that does not impair their suitability for congressional designation in accordance with FLPMA Section 603(c). Subject to valid existing rights, actions may be allowed on a case-by-case basis only where the BLM determines that the lands' wilderness suitability would not be impaired. All of these areas are designated and protected under the authority of Section 603 of FLPMA, are managed according to the *Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP)* (BLM 1995), to preserve their wilderness values until Congress either designates them wilderness or releases them for other uses. Only Congress can designate a WSA/ISA as wilderness or release it from the protective mandate of Section 603 of FLPMA, and the status of these areas will not change as a result of this resource management planning process.

**Table 3.52. Acreage for BLM WSAs and ISAs in the Monticello PA**

Name	San Juan Resource Area <sup>1</sup> RMP	Utah BLM State Wide Wilderness Final EIS <sup>2,3</sup>	Utah Statewide Wilderness Study Report <sup>4</sup>
Dark Canyon Instant Study Area (ISA) <sup>5</sup>	62,040	68,030	68,030
Grand Gulch ISA <sup>6</sup>	37,810 <sup>7</sup>	105,520	105,520
Indian Creek WSA	6,870	6,870	6,870
Bridger Jack Mesa WSA	5,290	5,290	5,290
Butler Wash WSA	24,190	24,190	24,190
South Needles WSA	160	160	160
Middle Point WSA <sup>5</sup>	5,990		
Mancos Mesa WSA	51,440	51,440	51,440
Pine Canyon WSA <sup>6</sup>	10,890		
Cheesebox Canyon WSA	15,410	15,410	15,410
Bullet Canyon WSA <sup>6</sup>	8,520		

**Table 3.52. Acreage for BLM WSAs and ISAs in the Monticello PA**

Name	San Juan Resource Area <sup>1</sup> RMP	Utah BLM State Wide Wilderness Final EIS <sup>2,3</sup>	Utah Statewide Wilderness Study Report <sup>4</sup>
Slickhorn Canyon WSA <sup>6</sup>	45,390		
Road Canyon WSA	52,420	52,420	52,420
Fish Creek WSA	46,440	46,440	46,440
Mule Canyon WSA	5,990	5,990	5,990
Sheiks Flat WSA <sup>5</sup>	3,140		
Squaw Canyon WSA	6,580		6,676 <sup>8</sup>
Cross Canyon WSA	1,000		1,008 <sup>9</sup>
<b>Totals</b>	<b>387,410</b>	<b>381,760</b>	<b>389,444</b>

<sup>1</sup> In this column, except as noted, all acreage figures are from San Juan RMP (BLM 1991a).

<sup>2</sup> In this column, except as noted, all acreage figures are from Utah BLM State Wide Wilderness Final EIS (BLM 1990).

<sup>3</sup> Squaw/Papoose Canyon and Cross Canyon WSAs were not studied in the Utah BLM State Wide Wilderness Final EIS (BLM 1990) as they were studied in the San Juan / San Miguel Planning Area Wilderness EIS (BLM [Colorado] 1990).

<sup>4</sup> In this column, except as noted, all acreage figures are from Utah Statewide Wilderness Study Report (BLM 1991c).

<sup>5</sup> The Dark Canyon ISA combines with the Middle Point WSA to form the Dark Canyon ISA Complex, with a total of 68,030 acres.

<sup>6</sup> The Grand Gulch ISA combines with the Pine Canyon, Bullet Canyon, Slickhorn, and Sheiks Flat WSAs to form the Grand Gulch ISA Complex, with a total of 105,520 acres.

<sup>7</sup> The statewide wilderness EIS uses 37,580 acres for the Grand Gulch ISA. Acreage calculations for the San Juan RMP (BLM 1991a) from the master title plats revealed the actual total to be 37,807, which is rounded to 37,810. The difference between the two figures amounts to 0.6%.

<sup>8</sup> Total acres of this study area are 11,287, of which 4,611 acres are in Colorado.

<sup>9</sup> Total acres of this study area are 12,588, of which 11,580 acres are in Colorado.

The only decisions that will be made for these areas in this plan revision will be: 1) visual resource management (VRM) class designations in keeping with Bureau policy (VRM Class I); 2) off-highway vehicle management designations in keeping with the IMP (i.e., "closed," "limited to designated roads and trails," or "limited to existing roads and trails"), and 3) route designations where ways are either conditionally open (as long as suitability for Congressional wilderness designation is not impaired) or closed to vehicle use.

Although WSAs are by definition roadless, several of the WSAs do include inventoried ways (Table 3.53). During the 1979–1980 Utah Wilderness Inventory, it was necessary to divide routes used by motorized vehicles into "roads" and "ways." To be considered a road, 3 criteria had to be met: (1) constructed; (2) maintained by mechanical means; and (3) regular and continuous use. All other motorized routes were defined as ways, which could be left open to motorized travel as long as their use did not "impair" the suitability of the area for wilderness designation. There are no known impairments in the WSAs in the Monticello FO.

**Table 3.53. List of Inventoried Ways by WSA**

<b>WSA Name</b>	<b>Inventoried Ways (miles)</b>
Grand Gulch ISA	15.5
Pine Canyon WSA	2.5
Bullet Canyon WSA	6.0
Slickhorn Canyon WSA	13.25
Sheiks Flat WSA	0
Road Canyon WSA	7.0
Fish Creek WSA	19.8
Mule Canyon WSA	0.3
Mancos Mesa WSA	25.0
Cheese Box Canyon WSA	4.6
Indian Creek WSA	0
Bridger Jack Mesa WSA	0
Dark Canyon Instant Study Area (ISA)	6.0
Middle Point WSA	1.0
Butler Wash WSA	0
South Needles WSA	0
Squaw Canyon WSA	0
Cross Canyon WSA	0
<b>Total</b>	<b>100.95</b>

The BLM does not make decisions establishing scenic byways.

Scenic Byways:

**Indian Creek Corridor Scenic Byway:** SR-211 (Junction with US-191 14 miles north of Monticello) to its terminus at the Needles District of Canyonlands National Park.

**Bicentennial—Trail of the Ancients National Scenic Byway:** SR-95 from south of Blanding goes west across the Colorado River at Glen Canyon National Park (with a loop through Natural Bridges National Monument). A section also travels south from Blanding to the town of Bluff and then east to Montezuma Creek, and eventually into Colorado.

**Monument Valley to Bluff Scenic Byway:** US-163 from the Utah / Arizona border to the town of Bluff.

### Scenic Backways:

**Lockhart Basin Road Scenic Backway:** From Moab, on the Kane Creek Blvd at the intersection of US-191, to Hurrah Pass and onto the Lockhart Basin Road in the Monticello PA and it ends at SR-211 near Indian Creek.

**Elk Ridge Road Scenic Backway:** Begins 25 miles west of Blanding at the junction of SR-25 and SR-275; it turns onto Forest Road 088 (through the Manti-LaSal National Forest) and ends 48 miles later at the junction of SR-211.

**Abajo Loop Scenic Backway:** West from Monticello on Forest Road (FR) 105 to the junction of FR 079, and ends 35 miles later in the town of Blanding.

**Trail of the Ancients Scenic Backway:** Follows SR-261 including the Moki Dugway, from SR-95 to SR-163; and intersects SR-316 to the Goosenecks State Park. The Valley of the Gods road intersects SR-261 below the dugway for a 17 mile dirt and gravel loop drive.

## **3.16 SPECIAL STATUS SPECIES**

For BLM management purposes, special status species include those plant and wildlife species listed as endangered, threatened, proposed, and/or candidate under the Endangered Species Act, as well as those plant and animal species listed or proposed as sensitive by the BLM. Special status arises from habitat degradation and direct disturbance to individuals, often combined with inherently restricted species' distributions. Periodic review of the special status species list allows for additions and/or removals depending on the status of populations, habitat, and potential threats. Evaluation of environmental characteristics in the area of a proposed project is the first step in BLM protocol for special status species protection. If factors such as geology, soils, vegetation community type, elevation, or aspect are likely to support a known special status species, a qualified specialist must complete a survey. If the survey is contracted, a BLM specialist must approve the results. If a federally listed, proposed, or candidate species could potentially be affected by a proposed action, a Biological Assessment is prepared. The BLM must manage these species to prevent further habitat degradation or population loss. Recovery plans, special management area designations, and special management conditions are used to protect special status species. The BLM's Standards and Guidelines for Healthy Rangelands also provide habitat protection.

A total of 10 federally listed species and 59 BLM Sensitive Species were identified as having the potential to occur within the Monticello PA (see Table 3.54 and 3.54). It should be noted that some of the TES species may occur on lands managed by agencies or organizations other than the BLM.

### **3.16.1 SPECIAL STATUS SPECIES HABITAT**

The diversity of habitat in the Monticello PA is reflected in the diversity of animal life that occurs within its borders. The Monticello FO, Utah Division of Wildlife Resources (UDWR), or the USFWS, have identified the following federally protected threatened, endangered, candidate,

or nonessential, experimental population species, and sensitive species that could potentially occur within the Monticello PA.

### 3.16.2 FEDERALLY THREATENED AND ENDANGERED SPECIES

Table 3.54 provides a listing of the 10 federally threatened, endangered and candidate species potentially occurring in the Monticello PA. A narrative description of each species follows the table.

**Table 3.54. Federally Threatened, Endangered, and Candidate Species Potentially Occurring in the Monticello PA**

Scientific Name Common Name	Habitat	Status	Area of Potential and/or Known Occurrence
<b>Plants</b>			
<i>Carex specuicola</i> Navajo sedge	Seasonally wet, seeps, springs, hanging gardens in Navajo sandstone. 3,770–5,980'. Blooms late June–July.	Threatened	Endemic to San Juan County, UT and Coconino County, AZ
<b>Wildlife</b>			
<i>Gymnogyps californianus</i> California Condor	Colonies roost in snags, tall open-branched trees, or cliffs, often near important foraging grounds.	Endangered	Experimental, nonessential population known rarely throughout Utah
<i>Empidonax traillii extimus</i> Southwestern Willow Flycatcher	Low shrub, thickets, or groves of small trees, often near watercourses.	Endangered	Throughout southern Utah.
<i>Strix occidentalis lucida</i> Mexican Spotted Owl	Steep rocky canyons.	Threatened	Southern and eastern parts of Utah.
<i>Coccyzus americanus occidentalis</i> (Western) Yellow-billed Cuckoo	Riparian habitats.	Candidate	Throughout Utah.
<b>Fish</b>			
<i>Gila elegans</i> Bonytail	These rare found in eddies, pools, and backwaters near swift current in large rivers.	Endangered	Mainstem of the Colorado and Green rivers
<i>Ptychocheilus lucius</i> Colorado pikeminnow	Adults can be found in habitats ranging from deep turbid rapids to flooded lowlands. Young prefer slow-moving backwaters.	Endangered	Mainstem of the Colorado, Green, and San Juan rivers
<i>Gila cypha</i> Humpback chub	These are found in large rivers and deep canyons.	Endangered	Mainstem of the Colorado and Green rivers

**Table 3.54. Federally Threatened, Endangered, and Candidate Species Potentially Occurring in the Monticello PA**

Scientific Name Common Name	Habitat	Status	Area of Potential and/or Known Occurrence
<i>Xyrauchen texanus</i> Razorback sucker	These are found in slow backwater habitats and impoundments.	Endangered	Within the Green, Colorado, and San Juan river systems

Navajo Sedge (*Carex specuicola*)

This species is federally listed as threatened. It occurs seasonally in wet, seeps, springs, hanging gardens on sandy to silty soils derived from Navajo sandstone (Natureserve 2005). Navajo sedge is endemic to San Juan County, UT and Coconino County, AZ at elevations from 3,770 to 5,980 feet. There are no known populations on BLM land in the Monticello PA, but potentially suitable habitat is present and there are known populations on Navajo land in San Juan County (e-mail from Paul Curtis, Monticello BLM to Susan Kammerdiener, SWCA, January 26, 2006). This species blooms from late June through July. Existing threats to this species include grazing and groundwater pumping (Natureserve 2005).

Black-footed Ferret (*Mustela nigripes*)

The black-footed ferret is listed as an endangered species. It is considered the rarest mammal in North America but was once common throughout the Great Plains. All native populations have been extirpated. Successful captive breeding programs and reintroduction efforts are returning small populations to their native ranges. Prairie dog burrows provide potential retreats for ferrets and have been shown to be directly lined to fluctuations in the prairie dog population. Their diet consists of 90% prairie dogs and with recent declines in prairie-dog numbers, reintroduced populations are at risk. Within the Monticello PA, no known populations occur, but historical native ranges exist and reintroductions are being examined by state (UDWR) and federal agencies (personal communication between Tammy Wallace, BLM, and Thomas Sharp, SWCA, 2003).

Mexican Spotted Owl (*Strix occidentalis lucida*)

The Mexican Spotted Owl (MSO) is listed as a threatened species. MSO habitat includes steep slopes and canyons with rocky cliffs. Within the Colorado Plateau, owls are known to nest in steep-walled canyon complexes and rocky canyon habitat within desert shrub vegetation. MSOs lay eggs in late March and April with an incubation period of approximately 30 days and most eggs hatch by the end of May. Most owlets fledge in June and are fully independent by early October. The MSO exists in small isolated subpopulations and is threatened by habitat loss and disturbance from recreation, overgrazing, road development, catastrophic fire, timber harvest, and mineral development (USFWS 1995). The Monticello PA contains two MSO protected activity centers. Protected activity centers are areas (at least 600 acres in size) around a known nest or roost site in which minimal management is permitted. Owls may be in other areas within

the field office boundaries or near the borders. There is also USFWS designated critical habitat for this species within the Monticello PA (see Map 93). The USFWS designates critical habitat for threatened or endangered species to protect occupied habitat and to protect suitable but unoccupied habitat to allow for expansion of populations and recovery of the species. The BLM is required not to directly or indirectly alter the value of critical habitat for both the survival and recovery of MSO.

#### Southwestern Willow Flycatcher (*Empidonax traillii extimus*)

The Southwestern Willow Flycatcher (SWF) is listed as an endangered species. SWF utilizes and breeds in patchy to dense riparian habitats along streams and wetlands near or adjacent to surface water or saturated soils. These dense patches are often interspersed with small openings, open water, and/or shorter/sparser vegetation, creating a mosaic habitat pattern. Historically, nests were constructed in native willow species but currently the SWF will utilize both native and exotic species, such as tamarisk and Russian olive, which provide desired habitat requirements (USFWS 2002e). SWFs begin laying eggs as early as May but typically in mid-June. Young typically fledge the nest between June and mid-August (Sogge et al. 1997). Population declines are attributed to numerous, complex, and interrelated factors such as habitat loss and modification, expansion of invasive, non-native plants into breeding habitat, brood parasitism by cowbirds, vulnerability of small population numbers, and winter and migration stress. SWF have been documented migrating along the San Juan River, Comb Wash, and the Cross Canyon area. Recent mist netting studies in Cross Canyon have shown that they are potentially nesting in the area as well. There is also potentially suitable habitat in larger riparian areas throughout the Monticello PA (see Maps 54 and 84).

#### Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)

The Yellow-billed Cuckoo is listed as a candidate species that has been listed due to loss of riparian habitat from agricultural use, water use, road development and urban development. The Yellow-billed Cuckoo is a neotropical migrant that utilizes riparian valleys throughout the state. Yellow-billed Cuckoos have been documented only during migration along the San Juan River. There is also potentially suitable habitat in the larger riparian areas throughout the Monticello PA (see Map 65).

#### California Condor (*Gymnogyps californianus*)

The California Condor, a species on the federal list, has been sighted statewide since they were recently released as a nonessential, experimental population in northern Arizona in the later 1990s. California Condors prefer mountainous country at low and moderate elevations, especially rocky and brushy areas near cliffs. Colonies roost in snags, tall open-branched trees, or cliffs, often near important foraging grounds. Condors eat carrion, usually feeding on large items such as dead sheep, cattle, and deer.

Bonytail (*Gila elegans*)

The bonytail is listed as an endangered species and has drastically declined in numbers since the 1960s. The reasons for the decline included flow depletion, dams, mining impacts and resulting siltation, and the introduction of exotic fish. It is a large cyprinid fish and little is known about its biological and diet requirements. Historically it was once widespread throughout the Colorado River Basin. Today it is thought to be found in large river reaches of the Colorado and Green rivers (USFWS 2002a). Recruitment in the natural environment is apparently nonexistent or extremely low. Bonytails seem to prefer big-river or mainstreams with eddies and pools rather than swift current. The Monticello PA contains both populations and designated critical habitat for this species (see Map 93).

Colorado Pikeminnow (*Ptychocheilus lucius*)

The Colorado pikeminnow is listed as an endangered species and is the largest cyprinid fish in North America. Natural populations of the Colorado pikeminnow are restricted to the upper Colorado River Basin in Wyoming, Colorado, Utah, and New Mexico (USFWS 2002c). The main stem of the Colorado River from Palisade, Colorado to Lake Powell has known population within this region. A small reproducing population exists in the San Juan River. According to the Colorado pikeminnow recovery goals (USFWS 2002c) these fish can be found in the San Juan River from Shiprock, New Mexico to the inflow of Lake Powell. Flow regulations, migration barriers, habitat loss/alteration, and introduced non-native fish have all been identified as causes for population decline. The Colorado pikeminnow is adapted to seasonally variable flow, high silt loads, and turbulence. The Monticello PA contains both populations and designated critical habitat for this species (see Map 93).

Razorback Sucker (*Xyrauchen texanus*)

The razorback sucker is listed as an endangered species and is a large catostomid fish endemic to the Colorado River basin. The Green River has the only known spawning areas for the razorback sucker (USFWS 2002d). Populations have been identified in the Colorado River from Rifle Colorado to Lee's Ferry Arizona and also in the San Juan River from Shiprock, New Mexico to the inflow of Lake Powell. Populations are being re-established through stocking. The natural population of these fish is mostly aged adults with little or no recruitment. These fish prefer low-gradient, flat-water reaches of rivers. The Monticello PA contains both populations and USFWS designated Critical Habitat for this species (see Map 93).

Humpback Chub (*Gila cypha*)

The humpback chub is listed as an endangered species and is a big-river cyprinid. Populations of humpback chub have been identified in the Upper Colorado River Basin with the highest concentrations found in the Black Rocks and Westwater Canyon reaches of the Colorado River near the Colorado–Utah state line (USFWS 2002b). The presence of juvenile populations suggests spawning may occur in the Upper Colorado River at Black Rock, Westwater Canyon, Cataract Canyon, and Desolation/Gray Canyon. Flow alterations have been identified as a significant cause of decline. The habitat types in which the humpback chub is found include

waters with fast currents, deep pools and boulder habitat; as well at the relatively quiet mouth of the Little Colorado River (USFWS 1990a). The Monticello PA contains both populations and USFWS designated Critical Habitat for this species (see Map 93).

There are no listed threatened, endangered, or candidate amphibian, reptilian or mollusk species with the Monticello PA.

### 3.16.3 BLM SENSITIVE SPECIES

The BLM maintains a list of sensitive species that may occur on managed lands. The BLM Utah state director's Sensitive Species List includes those that are federally listed species, those identified by the BLM, and those listed as state sensitive by the State of Utah. In 2002, the USFWS developed a list of Birds of Conservation Concern (BCC) that identifies migratory and nonmigratory avian species that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973. Partners in Flight (PIF) Priority Species are those species recognized by Utah Partners in Flight as birds most in need of conservation and are described in further detail in the Utah Partners in Flight Avian Conservation Strategy (Parrish et al. 2002). The following tables list the species that potentially, or are known to occur within the Monticello PA and are either on the BLM Utah state director's Sensitive Species List, the UDWR's State Sensitive Species List, the USFWS's Birds of Conservation Concern, or the UDWR's Partners in Flight Priority Species.

#### 3.16.3.1 SPECIAL STATUS WILDLIFE SPECIES

Thirty-eight BLM sensitive fish and wildlife species are known to occur in the Monticello PA and are listed in Table 3.55.

**Table 3.55. Special Status Wildlife Species Potentially Occurring in the Monticello PA**

Scientific Name Common Name	Habitat	Status/List	Area of Potential and/or Known Occurrence
<i>Idionycteris phyllotis</i> Allen's big-eared bat	Rocky and riparian areas in woodland and shrubland regions, roosts in caves or rock crevices.	The BLM and Utah	Throughout southern Utah.
<i>Nyctinomops macrotis</i> Big free-tailed bat	Rocky and woodland habitats, roosts in caves, mines, old buildings, and rock crevices.	The BLM and Utah	Throughout southern Utah.
<i>Myotis thysanodes</i> Fringed myotis	Desert and woodland areas, roosts in caves, mines, and buildings.	The BLM and Utah	Throughout southern Utah.
<i>Cynomys gunnisoni</i> Gunnison's prairie-dog	Grasslands, semidesert and montane shrublands.	The BLM and Utah	Extreme southeastern Utah.
<i>Vulpes macrotis</i> Kit fox	Desert, semiarid landscapes.	The BLM and Utah	West desert and south of the Cisco Desert.

**Table 3.55. Special Status Wildlife Species Potentially Occurring in the Monticello PA**

Scientific Name Common Name	Habitat	Status/List	Area of Potential and/or Known Occurrence
<i>Microtus mogollonensis</i> Mogollon vole	Dry meadows.	The BLM and Utah	Southern part of San Juan County.
<i>Perognathus flavus</i> Silky pocket mouse	Semidesert arid grasslands with rocky or loamy soils	The BLM and Utah	Extreme southeast corner of San Juan County.
<i>Euderma maculatum</i> Spotted bat	Found in a variety of habitats, ranging from deserts to forested mountains; roost and hibernate in caves and rock crevices.	The BLM and Utah	Throughout Utah.
<i>Corynorhinus townsendii</i> Townsend's big-eared bat	Occur in many types of habitat, but is often found near forested areas; roosts and hibernates in caves, mines, and buildings.	The BLM and Utah	Throughout Utah.
<i>Buteo regalis</i> Ferruginous Hawk	Flat and rolling terrain in grassland or shrub steppe; nests on elevated cliffs, buttes, or creek banks.	The BLM, Utah, BCC, and PIF	Throughout Utah.
<i>Pelecanus erythrorhynchos</i> American White Pelican	Along lakes, ponds, creeks, and rivers.	The BLM, Utah, and PIF	Throughout Utah.
<i>Dolichonyx oryzivorus</i> Bobolink	Riparian or wetland areas.	The BLM, Utah, and PIF	Throughout Utah.
<i>Athene cunicularia</i> Burrowing Owl	Open grassland and prairies.	The BLM and Utah	Throughout Utah.
<i>Haliaeetus leucocephalus</i> Bald Eagle	Roosts and nests in tall trees near bodies of water.	The BLM and Utah	Throughout Utah
<i>Melanerpes lewis</i> Lewis's Woodpecker	Burned-over Douglas-fir, mixed conifer, pinyon-juniper, riparian, and oak woodlands, but is also found in the fringes of pine and juniper stands, and deciduous forests, especially riparian cottonwoods.	The BLM, Utah, and PIF	High and mid-elevation mountain ranges of Utah.
<i>Accipiter gentiles</i> Northern Goshawk	Mature mountain forest and riparian zone habitats.	The BLM and Utah	High and mid-elevation mountain ranges of Utah.
<i>Peregrinus falconus</i> Peregrine Falcon	Steep, rocky canyons near riparian or wetland areas.	The BLM and BCC	Throughout Utah.
<i>Buteo swainsonii</i> Swainson's Hawk	Plains and grasslands.	BCC	Throughout Utah
<i>Falco mexicanus</i> Prairie Falcon	Plains and wooded areas.	BCC	Throughout Utah

**Table 3.55. Special Status Wildlife Species Potentially Occurring in the Monticello PA**

<b>Scientific Name Common Name</b>	<b>Habitat</b>	<b>Status/List</b>	<b>Area of Potential and/or Known Occurrence</b>
<i>Asio flammeus</i> Short-eared Owl	Grasslands, shrublands, and other open habitats.	The BLM and Utah	Throughout Utah.
<i>Picoides tridactylus</i> Three-toed Woodpecker	Engelmann spruce, sub-alpine fir, Douglas fir, grand fir, ponderosa pine, tamarack, aspen, and lodgepole pine forests.	The BLM, Utah, and PIF	High and mid-elevation mountain ranges of Utah.
<i>Spizella breweri</i> Brewer's Sparrow	Sage and desert shrub.	PIF and BCC	Throughout Utah
<i>Dendroica nigrescens</i> Black-throated Gray Warbler	Dry western deciduous or coniferous shrub.	PIF and BCC	Throughout Utah
<i>Selasphorus platycercus</i> Broad-tailed Hummingbird	Mountains of Rocky Mountain region and lowland riparian	PIF and BCC	Throughout Utah
<i>Vireo vicinior</i> Gray Vireo	Pinyon and/or juniper woodland	PIF and BCC	Throughout Utah
<i>Lanius ludovicianus</i> Loggerhead Shrike	Sage and desert shrub.	BCC	Throughout Utah
<i>Gymnorhinus cyanecephalus</i> Pinyon Jay	Sage and desert shrub and pinyon and/or juniper woodlands	BCC	Throughout Utah
<i>Amphispiza belli nevadensis</i> Sage Sparrow	Shrub steppe habitat	PIF and BCC	Throughout Utah
<i>Vermivora virginiae</i> Virginia's Warbler	Mountain shrub and pinyon-juniper habitat	PIF and BCC	Throughout Utah
<i>Centrocercus minimus</i> Gunnison Sage-grouse	Sagebrush and sagebrush/grassland habitats (see Map 65).	The BLM, PIF, BCC	Populations known in the northeastern portion of the Mont FO.
<i>Bufo microscaphus</i> Arizona toad	Lowland riparian habitat.	The BLM and Utah	Currently not found in San Juan County. Found in Southern portion of Utah.
<i>Sauromalus ater</i> Common chuckwalla	Predominantly found near cliffs, boulders, or rocky slopes, where they use rocks as basking sites and rock crevices for shelter.	The BLM and Utah	Along the Colorado River in Southern Utah.

**Table 3.55. Special Status Wildlife Species Potentially Occurring in the Monticello PA**

<b>Scientific Name Common Name</b>	<b>Habitat</b>	<b>Status/List</b>	<b>Area of Potential and/or Known Occurrence</b>
<i>Xantusia vigilis</i> Desert night lizard	Extremely secretive, spending much of its time hiding under Joshua tree limbs and similar cover.	The BLM and Utah	Throughout Southeastern Utah.
<i>Opheodrys vernalis</i> Smooth greensnake	Meadows and stream margins	The BLM and Utah	Abajo mountains
<i>Catostomus discobolus</i> Bluehead sucker	Fast flowing water in high gradient reaches of mountain rivers.	The BLM and Utah	Tributaries of the Colorado and Green rivers.
<i>Gila robusta</i> Roundtail chub	Large rivers, and is most often found in murky pools near strong currents.	The BLM and Utah	Mainstem and tributaries of the Colorado and Green rivers.
<i>Catostomus latipinnis</i> Flannelmouth sucker	Large rivers, where they are often found in deep pools of slow-flowing, low gradient reaches.	The BLM and Utah	Mainstem and tributaries of the Colorado and Green rivers.
<i>Oreohelix Yavapai</i> Yavapai mountainsnail	Aspens and in rocky habitat.	The BLM and Utah	Abajo and Navajo Mountains

**3.16.3.2 SPECIAL STATUS PLANT SPECIES**

Twenty-one BLM sensitive plant species are known to occur in the Monticello PA and are listed in Table 3.56.

**Table 3.56. Special Status Plant Species with the Potential to Occur in the Monticello PA, San Juan County, Utah**

<b>Scientific Name Common Name</b>	<b>Habitat</b>	<b>Status (with date if only on one list)</b>	<b>Area of Potential and/or Known Occurrence</b>
<i>Allium geyeri</i> var. <i>chatterleyi</i> Chatterley's onion	Moist pinyon-juniper and sagebrush sites.	Sensitive (2002)	San Juan County (Abajo Mountains endemic)
<i>Asclepias cutleri</i> Cutler milkweed	Sand dunes.	Sensitive (1991)	San Juan County
<i>Astragalus cronquistii</i> Cronquist milkvetch	Cutler formation (Comb Wash), Morrison formation (Aneth), Mancos shale in Colorado.	Sensitive	San Juan County
<i>Astragalus preussii</i> var. <i>cutleri</i> Copper Canyon milkvetch	Warm desert shrub. 3,805'. Copper Canyon.	Sensitive (1991)	San Juan County endemic

**Table 3.56. Special Status Plant Species with the Potential to Occur in the Monticello PA, San Juan County, Utah**

<b>Scientific Name Common Name</b>	<b>Habitat</b>	<b>Status (with date if only on one list)</b>	<b>Area of Potential and/or Known Occurrence</b>
<i>Cymopterus acaulis</i> var. <i>parvus</i> Skull Valley spring- parsley	Deposits of wind-blown sand.	Sensitive (2002)	San Juan County
<i>Cymopterus beckii</i> Pinnate (Beck's) spring- parsley	Sandy soil of Navajo sandstone origin. Crevices and ledges of slickrock. Mid-high elevation in Abajo Mountains.	Sensitive	San Juan County– Eight occurrences
<i>Dalea favescens</i> var. <i>epica</i> Hole-in-the-Rock prairie clover	Sandstone bedrock and sand in blackbrush and mixed desert shrub. 4,690–5,000'.	Sensitive	(1991, San Juan County) Southwest San Juan County and east Garfield endemic
<i>Echinocereus</i> <i>triglochidiatus</i> var. <i>inermis</i> Spineless hedgehog cactus	Blackbrush, ephedra, sagebrush, pinyon-juniper mountain brush, aspen communities. 3,200–8,400'.	Sensitive (1991)	San Juan County. Spineless variety is a neotype from San Juan County
<i>Epilobium nevadense</i> Nevada willowherb	Talus slopes, crevices.	Sensitive (2002)	San Juan County (Washington, Iron, and Millard counties)
<i>Erigeron kachinensis</i> Kachina daisy	Seasonally wet seeps, hanging gardens on sandstone outcrops.	Sensitive	San Juan County Colorado Plateau endemic (Natural Bridges National Monument Dark Canyon and Elk Ridge)
<i>Eriogonum racemosum</i> var. <i>nobilis</i> Redroot buckwheat	Sagebrush and pinyon-juniper. 5,000'.	Sensitive (2002)	San Juan County
<i>Gilia latifolia</i> var. <i>imperialis</i> Cataract Canyon gilia	Mixed warm and cool desert shrub communities. 3,280– 5,215'.	Sensitive (2002)	San Juan County (type from Cataract Canyon) Utah Endemic
<i>Habenaria zothecina</i> Alcove bog orchid	Moist streambanks, seeps, hanging gardens, in mixed desert shrub, pinyon-juniper, and oakbrush. 4,360–8,690'.	Sensitive (2002)	San Juan County, Grand County (type) Utah endemic

**Table 3.56. Special Status Plant Species with the Potential to Occur in the Monticello PA, San Juan County, Utah**

<b>Scientific Name Common Name</b>	<b>Habitat</b>	<b>Status (with date if only on one list)</b>	<b>Area of Potential and/or Known Occurrence</b>
<i>Lomatium latilobum</i> Canyonlands lomatium (C. biscuitroot, or C. desert-parsley)	Slot canyons between Entrada sandstone 'fins' formed from expanded fractures and erosion. Sandy soil or crevices in sandstone. (Sand Flat and Mill Creek it's found in Navajo sandstone that weathers like Entrada.) Prefers the sheltered, cool habitat on all slopes and aspects.	Sensitive	San Juan County, Grand County (Wilson Mesa) Southeastern Utah (and adj. Mesa County Colorado) endemic. Thirteen occurrences
<i>Ostrya knowltonii</i> Western hophornbeam	A small tree at bases of monoliths, hanging gardens of sandstone. 4,000–5,600'.	Sensitive (1991)	San Juan County
<i>Pediomelum aromaticum</i> var. <i>tuhyi</i> Paradox breadroot	Pinyon -juniper and mixed desert shrub. 5,020'.	Sensitive (2002)	San Juan County (This variety differs from more widespread variety by size of flowers.)
<i>Perityle specuicola</i> Alcove rock-daisy	Drier crevices in seasonally wet hanging gardens, alcove communities at 4,000'. Navajo and Windgate sandstone and Rico Formation, but habitat not substrate specific.	Sensitive	San Juan County, Grand County (type north of Moab). Narrowly endemic to Colorado Plateau (from confluence of Colorado River with the Dolores and Dark Canyon)
<i>Phacelia howelliana</i> Howell scorpionweed	Salt and warm desert shrub, pinyon-juniper. 3,690–5,000'.	Sensitive (1991)	San Juan County (type from Bluff). Colorado Plateau endemic
<i>Phacelia indecora</i> Bluff phacelia	Salt desert shrub. 4,500'.	Sensitive (2002)	San Juan County (type from Bluff) Endemic
<i>Proatriplex pleiantha</i> Mancos shadscale	Salt desert shrub in Morrison Formation.	Sensitive (1991)	San Juan County (southeast) Navajo Basin endemic
<i>Sphaeralcea janeae</i> Jane's Globemallow	Sandy soils weathered white rim and Organ Rock members of Cutler Formation. salt desert shrub. 4,000–4,600'.	Sensitive (2002)	San Juan County (type near White Rim road), Grand County (questionable) Canyonlands endemic

Sources: BLM 2002d; Atwood et al. 1991.

## 3.17 TRAVEL MANAGEMENT

### 3.17.1 OVERVIEW

In the past, travel management has focused on motor vehicle use; however, travel management encompasses all forms of transportation, including mechanized vehicles such as bicycles, motorcycles, four-wheeled ATVs, cars, and trucks. Off-highway vehicles (OHVs) (also known as off-road vehicles) include ATVs, off-highway motorcycles, and snowmobiles. These are vehicles capable of, or designated for, travel on or immediately over land, water, or other natural terrain.

### 3.17.2 CURRENT MANAGEMENT PRACTICES

The San Juan RMP (BLM 1991a) included designations for Open, Closed, and Limited OHV areas. Under the Limited category there were two subcategories: 1) limited to existing roads and trails, and 2) limited to designated roads and trails (see Table 3.57 below). Over the subsequent decade, the actual on-the-ground implementation of designations either by mapping or signing of routes was never completed.

**Table 3.57. Current OHV Designation and Acreage**

Monticello PA Lands (1,783,123)	1991 BLM San Juan Resource Area RMP
OHV Designation Categories	Number of Acres <sup>1</sup>
Open	611,310
Limited to designated	218,780
Limited use, seasonal	540,260
Limited to existing	570,390
Closed	276,430

<sup>1</sup>Acreage may be additive because of overlap.

In the current RMP process, state and national guidance for OHV use and travel planning in the subcategories under the Limited designation has changed. Designating Open, Closed, and Limited areas for OHV use continues to be mandated, but under the Limited category only the "limited to designated roads and trails" subcategory is recommended.

Designation of routes under the Limited category provides a purposefully designed and clearly delineated travel network, reduces route proliferation, and facilitates travel management and law enforcement.

### 3.17.3 ISSUES

The increase in the use of OHVs has created numerous issues within the Monticello PA. The speed and increasing capability of OHVs allows easier access to remote parts of the Monticello PA, making management of this activity more difficult, and increasing the potential range of adverse impacts to natural resources. Cross-country OHV use, in particular, is creating additional resource damage and is an important issue for the Monticello FO. Also, the popularity of OHV-

related activities continues to grow, both in private use and in through special events, which exacerbates the management and resource impacts issues. With the increase in popularity, measures are needed to avoid on-site and off-site impacts to current and future land uses are resources. Issues include noise and air pollution, erodible soils, stream sedimentation, non-point source water pollution, listed and sensitive wildlife species habitats, and historic and archaeological sites.

### **3.17.4 VEHICULAR ROUTES**

Within the Monticello PA, 6,452 miles of B, C and D class roads and trails (including all ownership and all agencies) have been constructed or identified. To clarify, B class roads are regularly maintained; surfaces areas that can be natural, paved, or gravel and are funded by the state for maintenance purposes. C class roads are considered city streets; while D class roads are comprised of all natural surfaces, not funded by the state and not on a regular maintenance schedule. Approximately 2,481 miles of D class roads and trails are located throughout the Monticello PA. These routes provide access for uses such as grazing, wood cutting and mineral development. However, recreational opportunities provide the primary use of these roads and trails.

#### **3.17.4.1 HIGH USE AREAS**

Within the Monticello PA, specialists have identified 7 areas where OHV designations need to be addressed due to a variety of resource use conflicts. These conflicts have the potential to bring harm to users as well as the resources potentially impacted. At the very least, user conflicts may potentially degrade user satisfaction. These areas include Indian Creek, Dry Valley Summit, Montezuma Recapture Drainages, Butler-Comb-Lime, Cedar Mesa, Southwest Canyons, and Dark Canyon-Beef Basin. For additional details on user conflicts, see Section 3.11, Recreation.

#### **3.17.4.2 SCENIC BYWAYS AND BACKWAYS**

The BLM Backcountry Byways are components of the National Scenic Byway system. The program was established by the U.S. Department of Transportation in 1991. Roads may be recognized as scenic by-ways based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. There are no designated BLM Backcountry Byways in the Monticello PA.

Backways in Utah are primarily on BLM land; however, a few are on state and FS lands. Utah backways were named on June 2, 1989 as part of Utah's Byway and Backway program. All of these roads were a product of a statewide juried/vote process by leaders in regional communities. Since 1989, no Utah Backways have been designated; however, some have been removed for safety reasons (personal communications with Margaret Godfrey, Utah State Byway Coordinator, on January 26, 2006). Descriptions of the Scenic Byways and Backways found within the Monticello PA are given below.

### **3.17.4.2.1 SCENIC BYWAYS**

#### Indian Creek Corridor Scenic Byway

SR-211 (Junction with US-191 14 miles north of Monticello) to its terminus at the Needles District of Canyonlands National Park.

#### Bicentennial—Trail of the Ancients National Scenic Byway

SR-95 from south of Blanding goes west across the Colorado River at Glen Canyon National Park (with a loop through Natural Bridges National Monument). A section also travels south from Blanding to the town of Bluff and then east to Montezuma Creek, and eventually into Colorado.

#### Monument Valley to Bluff Scenic Byway

This route takes travelers on US-163 from the Utah / Arizona border to the town of Bluff.

### **3.17.4.2.2 SCENIC BACKWAYS**

#### Lockhart Basin Road Scenic Backway

This route runs from Moab, on the Kane Creek Blvd at the intersection of US-191, to Hurrah Pass, then onto the Lockhart Basin Road and ending at SR-211. (This is a 57-mile trail that takes approximately 11 hours to traverse, and is an extremely challenging four-wheel drive, high clearance trail).

#### Trail of the Ancients Scenic Backway

This route follows SR-261 including the Moki Dugway, from SR-95 to SR-163; and intersects SR-316 to the Goosenecks State Park. The Valley of the Gods road intersects SR-261 below the dugway for a 17-mile dirt and gravel loop drive.

#### Elk Ridge Road Scenic Backway

This route begins 25 miles west of Blanding at the junction of SR-25 and SR-275; it turns onto Forest Road 088 (through the Manti-La Sal National Forest) and ends 48 miles later at the junction of SR-211.

#### Abajo Loop Scenic Backway

This route runs from Monticello on Forest Road (FR) 105 to the junction of FR 079, and ends 35 miles later in the town of Blanding.

### 3.17.4.3 SAN JUAN RIVER

Permitted motorized and nonmotorized travel is allowed on the San Juan River under the current RMP. NO upstream motorized traffic is allowed.

## 3.18 VEGETATION

### 3.18.1 INTRODUCTION AND RESOURCE OVERVIEW

Differences in vegetation composition reflect the environmental diversity across the Monticello PA. This vegetation composition is affected by factors such as soils, elevation, aspect, slope, topography, and precipitation. In the current RMP, vegetation in the Monticello PA was classified into one of 4 major vegetation communities (BLM 1989): pinyon pine–Utah juniper (*Pinus edulis*—*Juniperus osteosperma*), saltbush (*Atriplex* spp.), sagebrush (*Artemisia* spp.), and blackbrush (*Coleogyne ramosissima*). These are further divided into 16 vegetation associations and habitat types. Although a small part of the FO area, grasslands, ponderosa pine/mountain shrub, riparian/wetlands and hanging gardens have been added as vegetation communities. Federally threatened and endangered and BLM sensitive plant species are discussed in Section 3.16, Special Status Species.

Vegetation across the Monticello PA has been identified using Utah SWReGap Analysis data (USGS 2004), which was developed using multi-spectral satellite imagery in conjunction with image processing and classification software. The relationship between spectral signatures and vegetation types was further refined through the development of models that incorporated a variety of topographic and distributional information for a given vegetation type. Utah SW ReGAP vegetation data were designed to be used for depicting the distribution of the state's various vegetation types at scales of 1:100,000 or smaller. Thus, while adequate for characterizing vegetation over large areas, this data are less accurate when viewed for smaller project areas. Gap coverage data were used to display the land cover types that exist in the Monticello PA (Map 65). Some of the SW ReGAP vegetation cover types were combined; resulting in the land cover categories presented in Table 3.58. The non-vegetated land cover categories are not discussed in this section. No acreages are provided for the hanging gardens vegetation type due to the vertical nature of the community.

**Table 3.58. BLM Acres of Land by SW ReGAP Cover Type**

Cover Type	Acres
Pinyon-juniper (includes juniper, pinyon-juniper and pinyon)	1,147,407
Desert shrub (includes salt desert shrub, greasewood and blackbrush)	421,863
Sagebrush/perennial grassland (includes sagebrush, sagebrush/perennial grass, desert grassland and dry meadow)	166,122
Riparian and wetlands	20,699
Conifer /mountain shrub (includes ponderosa pine/mountain shrub, oak/mountain shrub and mountain shrub)	10,802
Invasive plants and noxious weeds	3,429

**Table 3.58. BLM Acres of Land by SW ReGAP Cover Type**

Cover Type	Acres
Agriculture	5,543
Water	1,446
Developed	227
Disturbed	7,858
<b>Total BLM Lands in FO</b>	<b>1,785,396</b>

**3.18.1.1 PINYON-JUNIPER**

These woodlands, dominated by pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), cover approximately 1,147,407 acres (64%) (USGS 2004) of the Monticello FO. In this habitat type, precipitation in this habitat ranges from 12 to 18 inches annually and occurs primarily in the winter. Productivity, species composition, and resiliency differ within this type depending on soil depth. As stands mature toward full canopy closure, understory vegetation becomes sparse and forage value decreases. Habitat types outlined in the 1986 Draft San Juan RMP (BLM 1986a) include:

- Pinyon pine, Utah juniper, blackbrush (*Coleogne ramosissima*), galleta grass (*Hilaria jamesii*);
- Pinyon pine, Utah juniper, Nuttall's saltbush (*Atriplex nuttallii*), galleta grass, Indian ricegrass (*Oryzopsis hymenoides*);
- Pinyon pine, Utah juniper, big sagebrush (*Artemisia tridentata*);
- Pinyon pine, Utah juniper, Utah serviceberry (*Amelanchier utahensis*);
- Pinyon pine, Utah juniper, mountain big sagebrush (*Artemisia tridentata* var. *vaseyana*), Gambel oak (*Quercus gambelii*).

Unhealthy pinyon-juniper stands are evident across the Monticello PA, especially on sites with shallow soils. Pinyon mortality, attributed to the combination of drought, Ips beetle, and root disease, is estimated at 20–30% in the Monticello PA. Pinyon is a valuable resource for other programs such as woodlands (firewood harvest) and wildlife habitat management. It also provides pine nuts for human collection and consumption. The increase in dead wood has led to an increase in fuel loading and area fire hazards. However, this dead wood also provides a short-term resource as collectable firewood.

Pinyon-juniper encroachment on sites with deep soils is continuing. More sagebrush communities and understory vegetation are lost as this occurs, resulting in an increase in soil erosion. Following wildfires, rehabilitation seedings have occurred in pinyon-juniper woodlands on throughout the Monticello PA. More information on this vegetation type is located in Section 3.21, Woodlands.

### 3.18.1.2 DESERT SHRUB

This vegetation type includes desert shrub and semidesert shrub species. These areas receive relatively low annual precipitation (5–10 inches), which translates into very low available soil moisture. The soils that support members of the saltbush zone are also often highly saline. These factors limit this type's ability to recover following disturbance. Drier saltbush areas contain species such as four-wing saltbush (*Atriplex canescens*), shadscale (*Atriplex confertifolia*) and winterfat (*Krascheninnikovia lanata*). Greasewood (*Sarcobatus vermiculatus*) dominates in areas where the water table is near the surface (MacMahon 1988). Elevation ranges from 4,000 to 5,400 feet. Approximately 421,863 acres, or 24% of the Monticello FO, includes the following habitat types outlined in the 1986 San Juan Draft RMP (BLM 1986a):

- Shadscale, Mormon tea (*Ephedra* spp.), blackbrush;
- Indian ricegrass, galleta grass, shadscale, fourwing saltbush;
- Shadscale, Mormon tea, blackbrush, pinyon pine, Utah juniper;
- Fourwing saltbush, Mormon tea, blue grama (*Bouteloua gracilis*), Indian ricegrass, galleta grass;
- Fourwing saltbush, blue grama, Indian ricegrass, galleta grass, big sagebrush;
- Pinyon pine, Utah juniper, blackbrush;
- Shadscale, Mormon tea, blackbrush, galleta grass, Indian ricegrass;
- Fourwing saltbush, Mormon tea, galleta grass, Indian ricegrass (USGS National Gap Analysis Program 2004).

### 3.18.1.3 SAGEBRUSH/ PERENNIAL GRASS

The moderately deep soils and greater amount of precipitation in this zone (11 to 16 inches per year) combine to create these relatively productive vegetation communities. Big sagebrush predominates on the more favorable sites, and black sagebrush (*Artemisia nova*) on the shallow rocky sites. Important associated forage plants include bitterbrush (*Purshia tridentata*), Indian ricegrass, western wheatgrass (*Elymus smithii*), Sandberg bluegrass (*Poa secunda*), and squirreltail (*Sitanion hystrix*). Elevation ranges from 5,500 to 7,300 feet with little localized relief. This vegetation type occurs across approximately 166,122 acres, or 9% of the Monticello FO (USGS 2004), and provides crucial winter range for big game wildlife species. Habitat types outlined in the 1986 Draft San Juan RMP (BLM 1986a) include big sagebrush, pinyon pine, Utah juniper, galleta grass, needle-and-thread grass (*Stipa comata*), blue grama, and Indian ricegrass.

Sagebrush stands are declining due to drought, insects (army cutworm), pinyon-juniper encroachment, motorized off-road travel, and lack of seedling recruitment. Large amounts of decadent plants (older age class) are evident, with a lack of age class diversity. The loss of sagebrush communities threatens wildlife habitat and species diversity across the Monticello PA. Seeding projects in the Monticello PA involve sagebrush restoration for deer winter range and habitat improvement for sage-grouse.

Grassland communities occur as a unique component of the Monticello FO. They are similar to salt-desert, sagebrush, and blackbrush types in species composition, but differ in that grasses dominate instead of browse species. The dominant grass species depend on the soil, with species such as saltgrass (*Distichlis stricta*), galleta grass, squirreltail, blue grama, and western wheatgrass occurring on heavy soils. Sandy sites usually support species such as Indian ricegrass, sand dropseed (*Sporobolus cryptandrus*), and needle- and-thread grass. Grassland communities occur from 4,000 to 6,000 feet with average precipitation total of 5 to 15 inches (Vallentine 1961).

Pinyon-juniper and shrub encroachment, along with that of invasive annuals such as cheatgrass (*Bromus tectorum*) and Russian thistle (*Salsola tragus*), are the main issues of concern for this community type.

#### **3.18.1.4 RIPARIAN AND WETLAND COMMUNITIES**

Riparian and wetland areas occur along waterways and water-bodies and are characterized by species such as willows (*Salix* spp.) and cottonwoods (*Populus* spp.). Approximately 28,994 acres of wetland and riparian areas exist in the Monticello Field. Although riparian and wetland areas represent only 1.6% of the FO area, they provide crucial wildlife habitat and contribute greatly to overall vegetation productivity and diversity. Riparian resource issues are covered in detail in Section 3.12, Riparian Resources.

Hanging gardens and spring-fed vegetation communities are rare to the arid and semiarid environments of the Colorado Plateau. Hanging gardens occur where groundwater seeps through sandstone or limestone substrates, often along overhanging cliffs adjacent to rivers. Plants found in hanging garden communities are often wetland-riparian species endemic to the Colorado Plateau (Spence unpub.). Spring-supported communities often contain riparian woodlands of species such as willow and cottonwood. Some less common, mixed-deciduous woodlands comprised of species such as birchleaf buckthorn (*Rhamnus betulifolia*) are also found in the region.

#### **3.18.1.5 CONIFER/ MOUNTAIN SHRUB**

This vegetation type occupies elevations between 6,500 and 9,000 feet (Dixon 1935) with an average of approximately 13 inches of precipitation annually (WRCC 2004). Where ponderosa pine is present, the understory is relatively sparse, commonly consisting of Snowberry (*Symphoricarpos* spp.), Rabbitbrush (*Chrysothamnus* spp.), Oregon grape (*Mahonia repens*), squirreltail, and buckwheat (*Eriogonum* spp.) Gambel oak dominated communities may dominate the lower end of the elevation range of this vegetation type and is considered a subclimax community (Dixon 1935). Approximately 10,802 acres of the ponderosa pine/mountain shrub vegetation type exists in the Monticello FO (Edwards et al. 1995). Although this vegetation type is not actively managed and only represents 0.6% of the FO area, it provides crucial wildlife habitat and ecological diversity (see Section 3.20, Wildlife and Fisheries).

### 3.18.1.6 INVASIVE PLANTS AND NOXIOUS WEEDS

One of the BLM's highest priorities is to promote ecosystem health and one of the greatest obstacles to achieving this goal is the rapid expansion of invasive, non-native species, or weeds, across public lands. A noxious weed is any plant designated by a federal, state or county government as injurious to public health, agriculture, recreation, wildlife or property (Sheley, Petroff, and Borman 1999). Noxious weeds are designated and regulated by various state and federal laws. Approximately 3,429 acres or 0.2% (USGS 2004) of the Monticello PA are dominated by this vegetation type. A systematic weed inventory has not been completed for the PA, but BLM estimates made in 2000 indicate that there were over 35,000 acres of noxious weeds, although most of that estimate was based on Russian Olive and Tamarisk infestation. The Monticello FO treats over 1,000 acres each year. Of particular concern is a population of Camelthorn, which is the only known infestation of this species in Utah. Significant efforts are being made to control it before it becomes widespread.

In most cases, noxious weeds are also non-native species (BLM 1991b). They are capable of invading plant communities and replacing native species, and are particularly successful following a disturbance. The BLM considers plants invasive if they have been introduced to an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread (Westbrooks 1998). These invasive plants can dominate and often cause permanent damage to natural plant communities. If not eradicated or controlled, noxious and invasive weeds could jeopardize the health of the public lands and the myriad of activities that occur on them. Noxious and invasive weed species identified in San Juan County are listed in Table 3.59 and a copy of the Noxious Weed Act is included as Appendix G.

The spread of invasive species across the management area continues to be a primary concern. Tamarisk and Russian olive infestations are found in many waterways and have resulted in vegetation compositions far removed from native riparian plant communities. Although known as a highly invasive species, without official designation as a problematic species, tamarisk eradication has not been mandatory in Utah. Populations of Russian knapweed have also reached high levels in many river corridors with camelthorn and ravenagrass (*Saccharum ravennae*) following suit. New species invasions such as these threaten existing vegetation communities, species diversity, and habitats of special status species.

Effects of the current drought are evidenced by reduced plant productivity. Unfavorable climactic conditions also predispose vegetation to insect infestations. Public interest in visiting the Monticello PA continues to grow, and with this comes a greater risk of disturbance to native plant communities and special status species. Activities such as seed collection have become more popular as the demand for drought-tolerant plants increases. Recreationists are seeking new areas, as well as continuing to visit popular destinations such as the San Juan River. Increased human visitation exposes new areas to disturbance and increases the chance for outbreaks of undesirable weeds.

Controlling undesirable and non-native species is one of the most difficult challenges, as well as one of the most significant problems, facing vegetation managers. The Monticello FO contracts with San Juan County to control weeds on BLM land utilizing integrated pest management strategies (combined use of mechanical, cultural, chemical, manual, biological and prevention

measures. San Juan County surveyed roads within the FO for noxious and invasive plant species in 1997 and 1998. When possible, these surveys are updated annually. Species found in the FO PA are included in Table 3.59.

**Table 3.59. Invasive and Noxious Weeds of San Juan County, Utah**

<b>Scientific Name</b>	<b>Common Name</b>
<i>Aegilops cylindrica</i>	Jointed goatgrass <sup>C S</sup>
<i>Alhagi pseudalhagi</i>	Camelthorn <sup>C</sup>
<i>Asclepias subverticillata</i>	Western whorled milkweed <sup>C</sup>
<i>Bromus tectorum</i>	Cheatgrass
<i>Cardaria draba</i>	Whitetop/Hoary cress <sup>S</sup>
<i>Carduus nutans</i>	Musk thistle <sup>S</sup>
<i>Centaurea diffusa</i>	Diffuse knapweed <sup>S</sup>
<i>Centaurea maculosa</i>	Spotted knapweed <sup>S</sup>
<i>Centaurea repens</i>	Russian knapweed <sup>S</sup>
<i>Centaurea squarrosa</i>	Squarrose knapweed <sup>S</sup>
<i>Cirsium arvense</i>	Canada thistle <sup>S</sup>
<i>Convolvulus arvensis</i>	Field bindweed <sup>S</sup>
<i>Cynodon dactylon</i>	Bermudagrass <sup>S</sup>
<i>Elaeagnus angustifolia</i>	Russian olive
<i>Elytrigia repens</i>	Quackgrass <sup>S</sup>
<i>Isatis tinctoria</i>	Dyer's woad <sup>S</sup>
<i>Lepidium latifolium</i>	Tall whitetop/Perennial pepperweed <sup>S</sup>
<i>Linaria genistifolia</i>	Dalmatian toadflax
<i>Onopordum acanthium</i>	Scotch thistle <sup>S</sup>
<i>Salsola tragus</i>	Russian thistle
<i>Solanum elaeagnifolium</i>	Silverleaf nightshade <sup>C</sup>
<i>Sorghum halepense</i>	Johnsongrass (Perennial Sorghum) <sup>S</sup>
<i>Solanum rostratum</i>	Buffalobur <sup>C</sup>
<i>Tamarix ramosissima</i>	Tamarisk (saltcedar)
<i>Tribulus terrestris</i>	Puncturevine

<sup>C</sup> San Juan County Listed Noxious Weed

<sup>S</sup> State of Utah Listed Noxious Weed

(Designations adapted from the "Noxious Weed Field Guide for Utah" [Merritt, Belliston, and Dewey 2000])

Weed eradication methods, such as herbicide spraying, must be consistent with the Final Environmental Impact Statement and Record of Decision (Utah) Vegetation Treatment on BLM Lands in Thirteen Western States (BLM 1991b and the Vegetation Treatments Using Herbicides on BLM Lands in 17 Western States (BLM 2007b). The use of certified weed-free hay is one guideline implemented from Utah BLM Health Standards and Guidelines for Healthy Rangelands to control the spread of noxious weeds (BLM 1997). For revegetation purposes, the use and perpetuation of native species is a priority, except for instances when non-intrusive, non-native species are more ecologically or economically feasible.

### **3.18.2 SEED AND PLANT COLLECTION**

Private individuals may collect seed and plants after acquiring a permit, which includes a list of stipulations. The public may collect seed on BLM-administered lands during non-drought years from a seed source that has been verified as being in good vegetative condition (vigor, viable seed, etc.). Popular species for seed collection include fourwing saltbush, globemallow (*Sphaeralcea* spp.), rabbitbrush (*Chrysothamnus* spp.), winterfat, and needle-and-thread grass.

Collection of individual forbs, grasses, and most shrubs is allowed for scientific purposes only. Federally protected plant species may not be collected, but BLM-listed sensitive species may be collected if the population is sufficiently large as to not be affected. Before collecting plant specimens, the local BLM FO must be notified. A list of species collected and a copy of the herbarium labels produced for each specimen must be submitted to the BLM Utah State Office at the end of collection season.

## **3.19 VISUAL RESOURCES**

### **3.19.1 RESOURCE OVERVIEW**

The Monticello PA contains an unusually large number of areas that possess a high degree of scenic quality and a high level of visual sensitivity. Each year, an increasing number of visitors come to the area to recreate and sightsee. The visual attributes of the region have made the Monticello PA popular for locals and visitors alike. In general, high scenic quality within the Monticello PA results from the extraordinarily diverse and distinct topography, geology, and cultural history. The area possesses scenically unique vistas and river ways; rare and unusual geological formations of sandstone, limestone, and shale; colorful and highly contrasting sandstone cliffs, arches, canyons, and spires; a diversity of vegetation ranging from aspen, pinyon and juniper, to cottonwood and cacti; and an extraordinary concentration of prehistoric rock art, and prehistoric and historic structures. Visually sensitive areas within the Monticello PA are also the result of visitor interest in and public concern for the visual resources of a particular area, the high degree of visibility to the public for a particular area, the level of use of an area by the public, and the type of visitor use that an area receives.

The major areas within the Monticello PA that possess both outstanding scenic quality and high visual sensitivity include, but are not limited to: the Dark Canyon Wilderness, Comb Ridge, Comb Wash, Butler Wash, Lockhart Basin, the Grand Gulch/Cedar Mesa Plateau and associated canyons, Valley of the Gods, Indian Creek Corridor, Goosenecks State Park Overlook, and a segment of the San Juan River from Sand Island to Clay Hills.

Areas of high scenic quality and visual sensitivity that are associated with travel corridors within the area include the Indian Creek Scenic Byway, the Scenic Byway from the Arizona Border to Bluff (US-163), Trail of the Ancients National Scenic Byway, the Bicentennial Scenic Byway (U-95), and the Lockhart Basin Road Scenic Backway. The Monticello PA also contains thousands of miles of jeep, bike, and foot trails that are traveled as scenic routes, many of which are internationally recognized.

### **3.19.2 CURRENT MANAGEMENT PRACTICES**

The current management of visual resources within the Monticello PA is guided by decisions made in the San Juan RMP ROD (BLM 1991a). The RMP establishes the Visual Resource Management (VRM) goals, which are to: 1) provide a systematic method to identify, evaluate, and manage visual resource values; 2) protect certain scenic values; and 3) minimize adverse visual impacts in other areas while allowing land-use activities to occur. The management guidance to achieve these objectives are to: 1) designate 5 ACECs (Butler Wash, Cedar Mesa, Dark Canyon, Indian Creek, and the Scenic Highway Corridor) in accordance with special conditions stipulated in Chapter 3 of the RMP; and 2) prepare management plans for these areas.

Under the current RMP, visual resources have been identified according to VRM classes. These classes are based on conditions such as scenic quality, viewing distance zones, and viewer sensitivity levels. The VRM class objectives and their descriptions are:

#### VRM Class I

The objective of Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activities. The level of change to the characteristic landscape should be very low and should not attract attention.

#### VRM Class II

The objective of this class is to retain the existing character of the landscape. The level of change to the landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes to the landscape must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

#### VRM Class III

The Class III objective is to partially retain the existing character of the landscape. The level of change to the landscape should be moderate. Management activities may attract the attention of the casual observer, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

#### VRM Class IV

The objective of Class IV is to provide for management activities that require major modifications to the existing character of the landscape. The level of change to the landscape can be high. The management activities may dominate the view and may be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic visual elements of form, line, color, and texture (BLM 1986b).

The VRM classes within the Monticello PA are listed in Table 3.60, with their acreages.

**Table 3.60. VRM Classes and Acreages**

<b>VRM Class</b>	<b>Acres</b>
I	397,477
II	419,536
III	522,921
IV	991,331
<b>Total</b>	<b>2,331,265</b>

Source: BLM 2003e.

The current Monticello RMP has established visual resource stipulations for several areas in the PA that are considered to have high scenic quality. These include the following:

- Butler Wash ACEC is managed to maintain its scenic quality, as VRM Class I. This would be accomplished by limiting surface disturbance to those projects for which revegetation could be successfully established within one year after project completion.
- Cedar Mesa ACEC is managed to protect cultural resources, scenic and natural values associated with primitive recreation. All ROS P class areas within the ACEC are managed as VRM Class I. Activities within the ACEC would be approved only with special conditions to protect visual resources.
- The Grand Gulch special emphasis area within the Cedar Mesa ACEC is managed to maintain scenic quality; surface disturbance would be managed to be compatible with VRM Class I criteria.
- The Valley of the Gods special emphasis area within the Cedar Mesa ACEC is managed to maintain scenic quality; surface disturbance would be managed to be compatible with VRM Class I criteria.
- To maintain scenic quality within the Indian Creek ACEC, surface disturbance will be limited to that for which revegetation could be successfully established within 1 year after project completion. The ACEC is managed as VRM Class I. Indian Creek ACEC is open for mineral leasing with stipulations to prevent surface occupancy; however, the FO manager could grant an exception to the No Surface Occupancy stipulation if an Environmental Assessment (EA) concludes that the project would not unduly impair the visual quality of the area. Recreational use will be limited if the activity causes damage to scenic quality.
- The Scenic Highway Corridor ACEC covers a visual zone along State Highways U-95, U-261, and U-276, and part of the White Canyon viewshed. To maintain scenic quality, surface disturbance will be limited to that for which revegetation could be successfully established within 5 years after project completion, and also managed as VRM Class I. All revegetation must be with native species naturally occurring within the area. The Scenic Highway Corridor ACEC will be open for mineral leasing with stipulations to prevent surface occupancy. However, the FO manager could grant an exception to the No Surface Occupancy stipulation if an EA concludes that the project would not unduly impair the visual quality of the area. Recreational use will be limited if the activity causes damage to scenic quality.

- Dark Canyon ACEC is managed to protect scenic values associated with primitive recreation, and activities within the ACEC would be approved to protect these values. Surface disturbances will be limited to those that can be successfully revegetated within 1 year after project completion. The ACEC is managed as VRM Class I, and recreation would be limited if cultural or scenic values were being damaged by recreational activities. Dark Canyon ACEC is closed to mineral leasing, mineral disposal, and OHV use.

### **3.19.2.1 CURRENT CONDITIONS**

The entire Monticello PA has been visually inventoried and classified according to the BLM VRM process. In general, the visual resources in the Monticello PA can be delineated in relation to US-191 that runs north-south through the FO PA. The area to the east of the highway is designated as VRM Class III and Class IV, with the exception of VRM Class II areas near Montezuma Creek and north of the town of Blanding. The remainder of the Monticello PA, to the west of US-191, contains all of those areas designated as possessing high scenic and visual qualities, that is, VRM Class I and Class II.

The emphasis on VRM has changed since the 1991 RMP was approved. The current 1991 RMP and application of VRM objectives have afforded protection of most resources; however, the subsequent rapid increases in recreational resource uses are having an impact on visual resources.

People are attracted to the area because of its extraordinary scenic quality and the many opportunities for recreation. Throughout the Monticello PA, impacts to the landscape are occurring from increased recreation and tourism, which include the impacts from increased OHV use. Additional impacts are also produced by the development of oil and gas resources, seismic exploration, livestock grazing improvements, and other land-use disturbances.

The increasing number of roads being used by recreationists in the Monticello PA is having indirect effects on visual resources. Seldom Seen zones (those areas that are not visible from major travel routes) are decreasing within the Monticello PA, and an increase in the number of vehicles and people on BLM roads is creating changes in foreground and middleground views and changes in visual sensitivity. An increasingly utilized network of two-track roads and routes is creating conditions that allow OHV users, campers, and woodcutters to expand surface disturbances and impact visual resources.

### **3.19.2.2 TRENDS**

Tourism is increasing within the Monticello PA. Increased recreational and vehicular use, and the increase in the number of visitors to Arches and Canyonlands National Parks, and Natural Bridges National Monument, who remain in the area and then recreate on BLM-administered lands (see Section 3.11, Recreation), contributes to the cumulative impact on visual resources.

The use of OHVs, trail use, and dispersed camping could have long-term cumulative impacts on visual resources. Oil and gas exploration and development are expected to continue within the Monticello PA and contribute some additional impacts to visual resources. Long-term trends for impacts to visual resources are:

- Increasing OHV-related recreational use could cause visual impacts within the FO PA;
- Increasing dispersed camping impacts, often as overflow from the nearby National Parks and Monuments, could impact VRM through increased surface and vegetative disturbance;
- Conflicts between OHV recreationists and hikers, sightseers, cultural site tourists, campers, hunters, river floaters, etc., who seek a high-level of scenic quality.

## **3.20 WILDLIFE AND FISHERIES**

### **3.20.1 RESOURCE OVERVIEW**

Great landscape diversity is found within the Monticello PA with lands associated with the Colorado River, San Juan River, and the Abajo Mountains. These land features have produced a unique combination of landforms and vegetation types and provide important habitat for wildlife and fish species.

### **3.20.2 BIG GAME SPECIES**

#### **3.20.2.1 MULE DEER (*ODOCOILEUS HEMIONUS*)**

Mule deer occupy most ecosystems in Utah but likely attain their greatest densities in shrublands characterized by rough, broken terrain and abundant browse and cover. Mule deer summer range habitat types include spruce/fir, aspen, alpine meadows, and large grassy parks located at higher elevations. Winter range habitat primarily consists of shrub-covered, south-facing slopes. Winter range habitat primarily consists of shrub-covered, south-facing slopes. Winter diets of mule deer consist of approximately 75% browse from a variety of trees and shrubs and 15% forbs. In the summer months, mule deer populations could be limited during years where there is little rainfall, water availability, and summer forage that reduces fawning success. In the winter months, insufficient quantity or quality of habitat or deep snow results in heavy concentration of deer on winter ranges, increasing the spread of disease, reduction in population, and fawning success.

The middle and higher elevations of the Monticello PA sustain a large mule deer population. There is one UDWR wildlife management unit for mule deer located within the Monticello PA boundaries. This wildlife management unit contains the San Juan Herd, which is separated into two subunits (Abajo Mountains and Elk Ridge). The present population trend of these herds is down (Table 3.61). There has also been a significant decline in mule deer populations throughout the State of Utah. This has been attributed to the recent drought and loss of winter habitat. Within the Monticello PA, there has been a loss/die-off of sagebrush habitat due to overgrazing, drought and insect infestations. These include crucial wintering areas, such as Beef Basin and Harts Draw. There are plans throughout the state with several agencies to restore sagebrush habitats using different treatment techniques (personal communication between Tammy Wallace,

BLM, and Thomas Sharp, SWCA Environmental Consultants, 2003). Population objectives are set by UDWR and may only be met if there is available habitat.

**Table 3.61 Current Population and Objectives for Mule Deer**

Herd Unit	Current Population	Population Objective	Percent of Objective
San Juan, Abajo Mountains	6800	13,500	50
San Juan, Elk Ridge	2350	7000	34

Mule deer are a representative guild species for the following habitats in the district, deciduous woodland, riparian, mountain shrub, pinyon-juniper woodland and sagebrush. Impacts to this species can be partly assessed through the impact to these habitat types.

### 3.20.2.2 ROCKY MOUNTAIN ELK (*CERVUS ELAPHUS NELSONI*)

Rocky mountain elk occupy most ecosystems in Utah but likely attain their greatest densities in grasslands, aspen and montane coniferous forest. Production or calving areas are used from mid-May through June and typically occupy higher elevation sites than winter range. Calving grounds are usually characterized by aspen, montane coniferous forest, grassland/meadow, and mountain brush habitats, and are generally in locations where cover, forage, and water are in close proximity (Fitzgerald et al. 1994; Seidel 1977; Kufeld 1973). Within the Monticello PA, typical elk winter range occurs between 5,500 and 7,500 feet elevation and comprises mountain shrub and sagebrush habitats.

The middle and higher elevations of the Monticello PA provide habitat for the local elk populations. Elk numbers have increased within San Juan County and have reached the population objectives that UDWR set (Table 3.62; personal communication between Chris Colt, UDWR, and Thomas Sharp, SWCA Environmental Consultants, 2003–2004). Population objectives are set by UDWR and may only be met if there is available habitat.

**Table 3.62. Current Population and Objectives for Rocky Mountain Elk**

Herd Unit	Current Population	Population Objective	Percent of Objective
San Juan	1300	1300	100

Rocky Mountain elk are a representative guild species for the following habitats in the district, grasslands, deciduous woodland, riparian, mountain shrub, pinyon-juniper woodland and sagebrush. Impacts to this species can be partly assessed through the impact to these habitat types.

### 3.20.2.3 PRONGHORN (*ANTILOCAPRA AMERICANA*)

Pronghorn antelope can be found and are generally associated with open plains where they feed mainly on browse and forbs. Pronghorn prefer to occupy areas with large tracts of flat to rolling open terrain where they rely on keen eyesight and swift movement to avoid predators. Within the

Monticello PA, pronghorn are typically found in the Dry Valley area and rely on this habitat year-round.

The UDWR Hatch Point herd is the only pronghorn herd within the Monticello PA and this herd also extends into the Moab FO PA. The antelope herd has expanded the area it inhabits to the east side of Highway 191. However, the population trend is down from recent years. UDWR will be managing this herd to increase numbers by proposing supplemental transplants. Table 3.63 shows the current pronghorn population and population objective for this herd unit. Population objectives are set by UDWR and may only be met if there is available habitat.

**Table 3.63. Current Population and Objectives for Pronghorn Antelope**

Herd Unit	Current Population	Population Objective	Percent of Objective
San Juan, Hatch Point	130–150	300	43–50

Portions of the antelope habitat within the Monticello PA are in less than desired condition. There may be insufficient cover available for fawns to hide in because they are born shortly after livestock are removed from the area and there typically has not been sufficient time for vegetation to grow and provide cover. These areas may also lack forb and shrub compositions necessary to provide adequate forage for antelope (personal communication between Tammy Wallace, BLM, and Thomas Sharp, SWCA Environmental Consultants, 2003).

Pronghorn are a representative guild species for grasslands and desert shrub habitats in the district. Impacts to this species can be partly assessed through the impact to these habitat types.

#### **3.20.2.4 DESERT BIGHORN SHEEP (*OVIS CANADENSIS NELSONI*)**

Desert bighorn sheep are uniquely adapted to inhabit some of the most remote and rugged areas. They prefer open habitat types with adjacent steep rocky areas for escape and safety. Habitat is characterized by rugged terrain including canyons, gulches, talus cliffs, steep slopes, mountaintops and river benches (Shackleton et al. 1999). Desert bighorn sheep typically forage on shrubs more than grasses and use forbs less than shrubs and grasses. Desert bighorns are found in southern Utah and typically do not migrate.

There are currently 3 UDWR herds units for desert bighorn sheep within Monticello PA. These include the San Juan (Lockhart), the North San Juan, and the South San Juan herds. Since the RMP was written, there is new data indicating bighorn sheep utilize the Lockhart Basin area. Under the current RMP, no provisions or designations of crucial bighorn sheep habitat were made in the Lockhart Basin area. The Moab FO of the BLM manages a small part of the habitat for the Lockhart herd. There is also evidence of the Lockhart herd going up the Redd Sheep Trail to Hatch Point.

Bighorn sheep habitat in the Monticello PA is generally in good condition, although the recent drought has caused forage and water depletions. There has also been a large increase in the amount of OHV use in bighorn sheep areas, which can cause stress to the animals. Additionally, the increased recreational use of roads could exacerbate habitat fragmentation impacts.

Bighorn sheep numbers are down from past stable numbers (Table 3.64). UDWR management goals are to increase all of these herds, as well as expanding the South San Juan Herd into BLM lands along the San Juan River from Bluff downstream to Lake Powell. These may be accomplished with supplemental transplants. Population objectives are set by UDWR and may only be met if there is available habitat.

**Table 3.64 Current Population and Objective for Desert Bighorn Sheep**

Herd Unit	Current Population	Population Objective	% of Objective
San Juan, South	120	300	40
San Juan, North	50	100	50
San Juan, Lockhart	90	200	45

### 3.20.2.5 OTHER BIG GAME SPECIES

Within the Monticello PA, there are UDWR management areas for black bear (*Ursus americanus*) (Map 72) and mountain lion (*Felis concolor*). These represent areas where populations of these species are sufficient to support hunting. In the Intermountain West, black bears rarely use open habitats. Here, they are typically associated with forested or brushy mountain environments and wooded riparian corridors (Zevloff and Collett 1988). Black bears tend to be nocturnal and are considered omnivorous. Preferred foods include berries, honey, fish, rodents, birds and bird eggs, insects, and nuts. Black bears obtain most of their meat from carrion. From November to April, bears enter a period of winter dormancy. Winter dens are located in caves, under rocks, or beneath the roots of large trees. The black bear is a representative guild species for old growth conifer habitat in the district. Impacts to this species can be partly assessed through the impact to this habitat type.

The mountain lion or cougar inhabits most ecosystems in Utah. However, it is most common in the rough, broken terrain of foothills and canyons, often in association with montane forests, shrublands, and pinyon-juniper woodlands (Fitzgerald et al. 1994). Lions feed primarily on large mammals, especially deer, but also eat coyotes, porcupines, beavers, mice, rabbits, birds, and even grasshoppers. Considering that the mountain lions primary prey item is the mule deer, addressing the impacts to mule deer habitat can best assess impacts to mountain lions.

### 3.20.3 AVIAN SPECIES

#### 3.20.3.1 RAPTORS

The Monticello PA includes considerable habitat of value to raptors. Raptors found in this area include eagles, falcons, hawks, harriers, and owls. Special habitat needs for raptors include nest sites, foraging areas, and roosting or resting sites. There are many red-tailed hawks and Cooper's hawk nesting areas as well as a few peregrine and golden eagle nest sites found within the Monticello PA. Raptors forage on small mammals or small birds. The most utilized raptor nesting habitats in the Monticello PA are generally found along riparian areas and/or cliff faces (personal communication between Tammy Wallace, BLM, and Thomas Sharp, SWCA Environmental Consultants, 2003).

The northern goshawk (*Accipiter gentiles*) is a representative guild species for old growth conifer habitat in the district. The golden eagle (*Aquila chrysaetos*) and the prairie falcon (*Falco mexicanus*) are representative guild species for cliff rock habitat. The ferruginous hawk and burrowing owl (*Athene canicularia*) are representative guild species for grassland habitat. The ferruginous hawk is also a representative guild species for desert shrub habitat. Impacts to these species can be partly assessed through the impact to these habitat types.

### 3.20.3.2 WATERFOWL

Waterfowl in the Monticello PA is generally associated with the Colorado and San Juan river drainages. Some waterfowl can also be found in other riparian areas, such as ponds, reservoirs, and perennial streams. Some individuals or species breed, winter, or remain yearlong in the state, while larger numbers pass through the area during the spring and fall migration. Many species feed on insects and small fish or amphibians in addition to aquatic plant foods. In addition, some species feed frequently on upland grasses and forbs in grassy fields and meadows where such vegetation is succulent and habitat is sufficiently open to preclude hiding predators and enable rapid flight. Within the Monticello PA, the most important areas for waterfowl are the Colorado and San Juan rivers, as well as Recapture Reservoir and a couple of permanent ponds such as those in Cross Canyon and Nancy Patterson Canyon.

### 3.20.3.3 UPLAND GAME BIRDS

There are several species of upland game birds within the Monticello PA (personal communication between Dean Mitchell, UDWR, and Thomas Sharp, SWCA Environmental Consultants, 2004; UDWR 2002; UDWR 2000). Some of the species include Gunnison Sage-grouse, Chukar (*Alectoris chukar*), Mourning Dove (*Zenaida macroura*), and Wild Turkey (both Merriams and Rio Grandes) (*Meleagris gallopavo*): and Gambel's Quail (*Callipepla gambelii*). Chukars prefer open, rocky, barren lands and eat grass shoots, seeds, grain, and insects. Turkeys utilize open woodland or forest clearings, as well as riparian areas and eat acorns, fruit, and seeds. Mourning doves are found in a variety of habitats, but mostly in farmlands and eat grains, small seeds, acorns, and fruit. Gambel's Quail are found in drier habitats and feed on seeds, grain, and insects.

Gunnison Sage-grouse are used as a representative guild species for sagebrush habitat in the district. Impacts to this species can be partly assessed through the impact to this habitat type. Sage-grouse require large expanses of sagebrush (*Artemisia* spp.) communities below 9,800 feet, with a diversity of grasses and forbs and healthy riparian ecosystems. The presence of each habitat type in healthy condition in close proximity to winter, lek, nesting, and brood-rearing habitat is essential. Population declines within the Monticello FO are attributed to habitat loss and fragmentation from increased roads, power lines, sagebrush conversions to farmlands, and reduction in riparian areas. Other issues decreasing habitat quality are livestock grazing, drought, land treatments, and herbicides. The northeast side of the Monticello PA contains populations and habitat for this species.

### 3.20.3.4 NEOTROPICAL MIGRATORY BIRDS

There are a wide variety of songbirds and neo-tropical migrants, which spend at least part of the year within the Monticello PA (Parrish et. al. 2002). These species utilize a wide variety of habitats found within the PA. The Monticello FO maintains information regarding neotropical migratory birds by conducting annual breeding bird surveys in June of each year with the U.S. Geological Survey and partnering with the UDWR using mist netting and point count surveys.

Most of the bird species (especially neo-tropical) are decreasing in numbers throughout their ranges. This can be seen with the type of species listed on the threatened and endangered species list for San Juan County. According to Parrish et al. (2002), riparian habitats are used as either breeding or wintering habitat by Utah's birds almost twice as much as any other habitat type. Within Utah, 66–75% of all bird species use riparian habitats during some portion of their life cycle. Shrublands, forest, and additional habitat groups (e.g. water, rock, playa, agriculture, urban, and cliff) all are about equal and second to riparian when considering their importance to bird species. To prevent further population declines for bird species, the protection of these habitat types, especially riparian are crucial. Certain species can be followed more closely as indicators of overall ecosystem health.

Loggerhead shrikes habitat consists of open country with short vegetation: pastures with fence rows, old orchards, mowed roadsides, cemeteries, golf courses, agricultural fields, riparian areas, and open woodlands. The loggerhead shrike is a small avian predator that hunts from perches and impales its prey on sharp objects such as thorns and barbed-wire fences. The Loggerhead shrike is one of the few North American passerines whose populations have declined continent wide in recent decades. Changes in human land-use practices, the spraying of biocides, and competition with species that are more tolerant of human-induced changes appear to be major factors contributing to this decline.

The sage sparrow is a migrant that summers in Idaho and winters in Arizona, New Mexico and northern Mexico. It is found in sagebrush flats and desert shrub areas. It usually nests in sagebrush and typically feeds on insects and seeds. This species has been in recent decline. This decline is due to reduced, fragmented, and lost sagebrush steppe habitat that has resulted from increased wildland fires and cheatgrass invasion.

This sage thrasher's populations are mostly stable where suitable shrub-steppe habitat remains. However, its numbers have been dramatically reduced, and in some cases, local populations have been eliminated, where there has been wholesale conversion of sagebrush rangeland.

The Brewer's sparrow major habitat type is sagebrush shrublands. The Brewer's sparrow is by far the most abundant bird there during spring and summer. Recent (1980s and 1990s) surveys (Rotenberry et. al. 1999) have shown breeding numbers to be in significant decline throughout the species' range. The causes are uncertain, but they may be related to fundamental changes in shrubland ecosystems being brought about by agriculture, grazing, and the invasion of exotic plant species.

The Warbling Vireo occupies predominantly riparian habitat, but may also use a variety of other habitats including oak/mountain shrub and deciduous forest. It builds its nests in the forked limbs

of trees from one to 40 meters (m) above the ground at elevations ranging from sea level to over 3,000 m. The species appears well adapted to human landscapes, as nests have been found in neighborhoods, urban parks, orchards, and farm fencerows. Its reproductive success in these areas has never been quantified, however.

The Green-tailed Towhee prefers species-rich shrub communities within shrub-steppe habitats, and disturbed and open areas of montane forest, often created by forest fires. The bulky nests of this species are concealed in shrubs, but often are prone to predation. In winter, individuals are common in dense mesquite (*Prosopis* spp.) shrub habitat along desert washes. Breeding bird survey data suggest that populations have been stable overall since 1966, with no significant broad trends (Dobbs et. al. 1998).

The juniper titmouse is a year-round resident of the pinyon-juniper and pine woodlands; it is also common in suburbs. It nests in snag holes, natural and made by woodpeckers. They typically feed on fruit, seeds and insects. This species is generally tolerant of human encroachment.

The Gray Flycatcher is a migrant species that summers in Utah and Idaho and winters in Mexico. It nests in arid pinyon-juniper woodlands and sagebrush areas. It builds its nest in the crotch of juniper trees or sagebrush. It feeds exclusively on insects. This species is still quite common but faces the same risks that other Sagebrush guild species face.

No known population of Yellow-billed Cuckoo exist at present within the Monticello PA (personal communication between Tammy Wallace, BLM, and Thomas Sharp, SWCA Environmental Consultants, 2003). The Yellow-billed Cuckoo, however, is a neotropical migrant that utilizes riparian valleys throughout the state. The Western Yellow-billed Cuckoo is associated with cottonwoods and Riparian cover, which provides nesting and brood-rearing habitat. Western Yellow-billed Cuckoos are obligate riparian nesters and are restricted to more mesic habitat along rivers, streams and other wetlands. Yellow-billed Cuckoos are discussed further under the sensitive species section of the document.

The Southwestern Willow Flycatcher (SWFL) utilizes and breeds in patchy to dense riparian habitats along streams and wetlands near or adjacent to surface water or saturated soils. These dense patches are often interspersed with small openings, open water, and/or shorter/sparser vegetation, creating a mosaic habitat pattern. Population declines are attributed to numerous, complex, and interrelated factors such as habitat loss and modification, invasion of exotic plants into breeding habitat, brood parasitism by cowbirds, vulnerability of small population numbers, and winter and migration stress. SWFL are discussed further under the sensitive species section of the document.

Song sparrows are relatively common in riparian habitat. They build open-cup nests near fresh water wherever suitable cover and insect food are present.

Spotted Towhee breed in wide variety of plant associations, all characterized by dense, broadleaf shrubby growth (variously described as brush, thickets, or tangles). This shrubby growth is typically only a few meters tall, with or without emergent trees, and provides deep, sheltered, semishaded litter and humus on ground, and a screen of twigs and foliage close overhead.

Mallard duck success in the wild reflects its adaptability to varied habitats, its hardiness in cold climates, its catholic food tastes, and its tolerance of human activities. The bulk of the Mallard's diet outside the breeding season consists of seeds of both natural wetland plants and agricultural crops. Although the mallard is the most heavily hunted duck species in North America, its populations remain more or less steady, and the species is not considered in danger. Nevertheless, managers carefully monitor and manage mallard populations and their habitats to ensure the continued prosperity of this extremely popular and successful duck (Drilling et al. 2002).

Several of the migratory birds can be used as guild species for different wildlife habitat types. The loggerhead shrike is associated with desert shrub habitat, the sage sparrow, sage thrasher and Brewer's sparrow are associated with sagebrush and perennial grassland, the Warbling Vireo, Green-tailed Towhee and Blue Grouse are associated with oak mountain shrub habitat, the juniper titmouse and Gray Flycatcher are associated with pinyon-juniper habitat and Yellow-billed Cuckoo, Southwestern Willow Flycatcher, Song Sparrow, Spotted Towhee, and Mallard duck are associated with riparian habitat. For the purposes of this analysis, impacts to these habitats will be used, in part, to assess impacts to these species. Unless stated above, the exact population status of all these species in the Monticello PA is not known.

#### 3.20.4 FISH AND AMPHIBIAN SPECIES

The Monticello PA provides habitat for fish and amphibian species because of the variety of aquatic habitats found within the resource PA, which include rivers, streams, ponds, springs, and marsh areas. Aquatic species in the Monticello PA include several TES species such as bonytail, Colorado pikeminnow, razorback sucker, roundtail chub, bluehead sucker, and flannelmouth sucker. Table 3.65 illustrates the current UDWR inventories of fisheries within the Monticello PA (personal communication between Tammy Wallace, BLM, and Thomas Sharp, SWCA Environmental Consultants, 2003).

Amphibians rely on water during a portion of their life cycle and are typically found near water sources. The aquatic habitat in the Monticello PA is generally associated with the Colorado and San Juan river drainages and perennial water sources. The BLM in partnership with U.S. Geological Survey have started conducting amphibian surveys since 2003 on two riparian areas within the Monticello PA. These include Indian Creek and Arch Canyon. These studies are to determine species and abundance that are within these canyons. To date, the species found in Arch Canyon include: Woodhouse's toad (*Bufo woodhousii*), Red-spotted toad (*Bufo punctatus*), and Northern leopard frog (*Rana pipiens*). In Indian Creek, Bufo species of tadpoles and a few red-spotted toads were found.

**Table 3.65. Inventory of Fisheries within Monticello PA**

FO Area	Species Present
Colorado River	Colorado pikeminnow, razorback sucker, bonytail, humpback chub, flannelmouth sucker, bluehead sucker, channel catfish ( <i>Ictalurus punctatus</i> ), roundtail chub, speckled dace ( <i>Rhinichthys osculus</i> ), Plains killifish ( <i>Fundulus zebrinus</i> ), fathead minnow ( <i>Pimephales promelas</i> ), red shiner ( <i>Cyprinella lutrensis</i> ), sand shiner ( <i>Notropis ludibundus</i> ), smallmouth bass ( <i>Micropterus</i>

**Table 3.65. Inventory of Fisheries within Monticello PA**

FO Area	Species Present
	<i>dolomieu</i> ), largemouth bass ( <i>Micropterus salmoides</i> ), carp ( <i>Cyprinus carpio</i> ), black bullhead ( <i>Ameiurus melas</i> ), walleye ( <i>Stizostedion vitreum</i> )
San Juan River	Colorado pikeminnow, razorback sucker, flannelmouth sucker, bluehead sucker, channel catfish, roundtail chub, speckled dace, fathead minnow, red shiner, sand shiner, smallmouth bass, largemouth bass, carp, black bullhead, yellow bullhead ( <i>Ameiurus natalis</i> ), walleye, northern pike ( <i>Esox lucius</i> )
Arch Creek	Flannelmouth sucker, mountain sucker, speckled dace
Montezuma Creek	flannelmouth sucker, bluehead sucker, channel catfish, roundtail chub, speckled dace, carp, fathead minnow, red shiner, sand shiner

\*Where *fathead minnow*, *red shiner*, *sand shiner* are added in italics, these are not necessarily documented. However, they are prolific in the mainstream Green and Colorado rivers. Thus, it is likely that they are in at least the lower extremities of these smaller tributaries.

### 3.20.5 OTHER WILDLIFE HABITAT

The Monticello PA contains a high diversity of small mammals because of the variety of habitats within the boundaries. Other wildlife species that are found within the field office area includes small mammals (cottontails, jackrabbits, squirrels, ground squirrels, mice, voles, and shrews), bats, reptiles, and invertebrate (insects). Bats roost in tree and rock crevices and caves. They rely on insects for food and are typically found near water sources feeding on insects (Oliver 2000). Reptiles have become adapted to living and reproducing entirely on land. They include turtles, lizards, and snakes. The Monticello PA contains a high diversity of reptile because of the variety of habitats found within the resource management area. Most turtles are aquatic, although a few live entirely on land. Lizards are found in grasslands and shrub deserts, boulders, cliffs, trees, and loose sand. Snakes can be aquatic, while some live in trees, and some live in burrows.

## 3.21 WOODLANDS

### 3.21.1 RESOURCE OVERVIEW

Woodland resources are generally defined as those tree species that are used as non-sawtimber products and are sold in units other than board feet. Woodland resources within the Monticello PA consist primarily of pinyon pine (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*). Pinyon-juniper woodlands are characterized by trees that are less than 33 feet tall.

Closed conifer woodlands (with a greater than 60% canopy cover) are dominated by pinyon pine, with Utah juniper as a common associate. This is the most extensive forest type in Utah exceeding, in acreage, all other forests combined (Lanner 1984). Utah juniper is the more dry-climate-adapted of the two species, often serving as nurse trees for pinyon in well-developed woodlands. The open conifer woodlands (characterized by a 25–60% canopy cover) form a wide landscape and are found at elevations of 4,000 to 7,000 feet. Major cover types include Utah juniper with associated shrub species such as big sagebrush (*Artemisia tridentata*) and native bunchgrasses. Utah juniper has increased with grazing, and, as grazing has intensified, the species has spread from ridges and mountain slopes to deep valleys. Most of the area where

pinyon/juniper woodland currently dominates was historically characterized by wildland fires burning every 15 to 50 years (Kitchen 2004, Miller and Tausch 2001). Both pinyon and juniper seedlings are tolerant of shade, but as wildland fire opens up the canopy cover, juniper seedlings tend to establish quickly in cut or burned areas, while pinyon seedlings tend to establish best under a canopy cover.

Cottonwood (*Populus* spp.) is a component of the Monticello PA's woodland resources that grows in riparian areas, with value to the Navajo Nation for ceremonial purposes. Cottonwood contributes to the proper functioning of riparian systems, in that it provides bank stabilization, shade, and wildlife habitat.

Timber resources within the Monticello PA consist of small stands of ponderosa pine, Douglas fir (*Pseudotsuga menziesii*), cottonwood, quaking aspen (*Populus tremuloides*), oak species (*Quercus* spp.), and box elder (*Acer negundo*). The quantities and concentrations of these timber species are too low to have commercial value, though they do have scenic, habitat, and watershed resource values. No commercial sales or harvesting of any timber species take place within the Monticello PA.

### **3.21.2 CURRENT MANAGEMENT PRACTICES**

The Monticello FO manages woodland products by controlling harvests and sales. It sells woodland resources in informally designated areas for fuel wood, fence posts, Christmas trees, and other uses as demand arises. Fuel wood harvests are limited to pinyon and juniper; on-site harvests of trees by recreationists, usually as fuel for campfires, are allowed except where specifically excluded (BLM 1991a).

The Monticello FO has conducted 72 pinyon-juniper treatment projects and treated 32,191 acres, primarily in the 1960s and 1970s, to remove pinyon-juniper and convert woodlands to grasslands for livestock and wildlife forage (BLM 2004f). Because of subsequent re-growth of pinyon-juniper stands, many of these project areas are now in need of re-treatment and additional management. These projects are being maintained through the Moab Fire District. Re-treatment would consist of prescribed burning and/or other types of treatments (e.g., mechanical, chemical) to reduce fuel loads (BLM 1989).

#### **3.21.2.1 ALLOCATIONS**

In accordance with Monticello FO policy, a portion of the value of all woodland sales are retained at the Monticello FO to defray the cost of road maintenance and land reclamation in woodlandcutting areas.

The current management of woodland resources within the Monticello PA is guided by decisions made in the San Juan RMP (BLM 1991a). This plan identifies management actions to support the woodland management objectives of 1) allowing use of woodland products in areas specified for this use; and 2) preserving woodland products in other areas to meet RMP goals. The current management actions for the resource, as specified in the RMP, include:

- Assigning all forestlands in the resource management area to one of 4 categories:
  1. Lands available for intensive management of forest products
  2. Lands available for restricted management of forest products
  3. Lands where forests are managed to enhance other uses
  4. Forestlands not available for management of forest products
- Using the RMP goals and management objectives to determine which areas are assigned to each category, and imposing conditions on forest products use; and
- Prior to any land treatment project that would remove woodland products, striving first for woodland sales and second for free use of woodland products.

The current management guidance for developing forest resources is:

- The Monticello FO may develop forest resources for sustained yield, where feasible, in areas where forest product sales are allowed under the RMP; and
- The RMP may impose conditions of use or reclamation requirement in certain areas.

### 3.21.2.2 CURRENT CONDITIONS

It is estimated that pinyon and juniper woodlands have increased ten-fold over the past 130 years throughout the Intermountain West (Miller and Tausch 2001). Wildland fire suppression and lack of thinning have contributed to dense, over-mature stands of pinyon-juniper throughout the Monticello PA, and woodland fuel loading is increasing (see Section 3.4, Fire Management). The inadequate harvesting or thinning of pinyon-juniper woodlands within the PA is also creating conditions in which growth and succession of woodland stands are exceeding their carrying capacity, thus causing a decline in understory vegetation and creating stresses from competition that lead to tree mortality. Stressed trees are more susceptible to disease and insect infestations, further contributing to fuel loading of dead/down wood. These conditions are also increasing the potential for uncontrolled, catastrophic wildland fires. Noxious weed species could replace woodland species in those woodland areas that are burned by uncontrolled, catastrophic wildland fire.

Since the approval of the current RMP, drought has weakened the pinyon and juniper trees, and an infestation by the Ips engraver beetle (*Ips* spp.) has caused a severe die-off. Based on the current trend, the infestation is likely to increase, exacerbated by current drought conditions and the competitive stresses described above. Currently, there is no program to contain the infestation, and though the rate of infestation and the degree of damage to woodland resources are unknown, the potential for a significant loss of woodland and timber resources is high. The loss of these resources would result in more fuel loading, further contributing to conditions that could increase the potential for catastrophic wildland fires (personal communication between Tammy Wallace, BLM, and David Harris, SWCA, March 21, 2003).

Past management practices to improve grazing habitat for wildlife and cattle included chaining of pinyon-juniper stands. This management technique is no longer a preferred treatment and is not being used at this time. Currently, a program is being developed (in coordination with the Moab FO) to thin the woodland understory using prescribed fire to decrease fuel loading/

hazardous fuels and to maintain old chained and reseeded areas (personal communication between Tammy Wallace, BLM, and David Harris, SWCA, March 21, 2003).

Creation of wilderness study areas (WSAs) within the PA have closed these areas to woodcutting, prescribed burning, and other woodland management options, with potentially long-term adverse impacts on woodland resources. The WSAs also preclude commercial harvesting and access trail construction. The WSAs are, in effect, woodcutting and prescribed burning exclusion zones. These conditions support the growth and succession of woodland stands that exceed their carrying capacity, which can cause a decline in understory vegetation, and create stresses from competition that lead to tree mortality, similar to conditions and effects described above for woodland resources throughout the Monticello PA.

Currently, there is no woodland resource monitoring in the Monticello PA, except unscheduled, occasional fuel load assessments being made by BLM fire personnel (personal communication between Tammy Wallace, BLM, and David Harris, SWCA, March 21, 2003).

Woodland harvesting that does not follow required stipulations is currently damaging surface cultural resource sites and creating a network of unauthorized roads and trails that is degrading visual quality, increasing soil erosion and sedimentation, and affecting overall watershed quality.

In addition to the previously described issues in upland woodlands, in riparian zones, cottonwood stands are being encroached upon and impacted by tamarisk (*Tamarix* spp.) and Russian olive, resulting in decreased wildlife habitat and declines in overall watershed health.

### **3.21.3 RESOURCE DEMAND AND FORECAST**

The current use of woodland resources within the Monticello PA is non-commercial harvesting of pinyon and juniper for fence posts, firewood, and Christmas trees. Such harvesting is allowed with a permit issued by the Monticello FO. Permits are not issued for collection of dead and downed cottonwood for ceremonial purposes.

A potential conflict exists between the Navajo Tribe's need to use the resource as fuel-wood and the Monticello FO's need to manage for woodland sustainability and health. Cedar Mesa is an area where the conflict is most obvious between the BLM and tribal resource needs, as most of Cedar Mesa is currently a WSA, which does not allow for firewood collection. Native Americans also want to be able to collect live cottonwood; however, this species is valuable for wildlife habitat, riparian function, and overall watershed health, and is being replaced by invasive species including tamarisk.

The limited information available regarding the current level of woodland harvesting is derived from data on woodland harvesting permits sold by the Monticello FO. For FYs 2000–2003, the trend indicates an increasing number of permits were issued for harvesting wood products (BLM 2003f). The actual level of woodland harvesting within the Monticello PA is unknown because 1) resource monitoring is very limited; 2) the FO area is large, remote, and difficult to access; and 3) it is assumed that some people cut wood without purchasing a permit.

The demand for woodland products (including firewood) is expected to increase. The number of cords of firewood that were sold over recent years has increased from 898 cords in 2000 to 1,137 cords in 2003 (BLM 2003f). The sale of Christmas trees is highly variable, and fluctuates from year to year. There are no limitations on woodland sales except in fire exclusion areas (designated as Wilderness Areas and WSAs).