USDA

United States Department of Agriculture

Assessment Report of Ecological, Social, and Economic Conditions on the Ashley National Forest

Forest Service

October 2017

Cover Photos:
(Top row) rafting on the Green River, cattle grazing near Brush Creek;
(Middle row) prescribed fire operations, historic fishing at Grandaddy Lakes, four-wheeler on a motorized trail;
(Bottom row) cross country skiers, Chepeta Lake road, ancient rock art.

Note: We make every effort to create documents that are accessible to individuals of all abilities; however, limitations with our word processing programs may prevent some parts of this document from being readable by computer-assisted reading devices. If you need assistance with this document, please contact the Ashley National Forest at 435-781-5118.

Ashley National Forest
Assessment Report

Prepared by:

Ashley National Forest
355 North Vernal Avenue
Vernal, UT 84078

Responsible Official:
Jeff E. Schramm

Assessment Report Team:

Dan Abeyta
Dustin Bambrough
Greg Bevenger
Ryan Buerkle
Robert Christensen
Joe Flores
Chris Gamble
Zoe Ghali
Brad Gillespie
Dave Herron
Allen Huber
Don Jaques
Sarah Leahy
Jim McRae
Valton Mortenson
Cathleen Neelan
Chris Plunkett
Gina Reese
Jeff Rust
Nikki Sandhoff
Colette Webb
Chris Whitney
Judy York

For further information or for copies of individual specialist reports, see the Ashley National Forest Web page at: https://www.fs.usda.gov/main/ashley/landmanagement/planning or contact the forest plan revision team at AshleyForestPlan@fs.fed.us or 435-781-5118.

Contents

Introduction

The mission of the Forest Service is to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations. To accomplish this mission, the Forest Service is tasked with managing lands for "sustainability." Each national forest and grassland has a land management plan that provides direction and guidance for its Forest Service managers to continue providing a variety of ecological, social, and economic benefits to the people of the United States.

> ***The idea of sustainability as it relates to national forest management is to create a balance between our ecological, social, and economic needs.***

Assessing Conditions to Revise Our Forest Plan

In July 2016, we—the staff of the Ashley National Forest—initiated the process of revising our land management plan (commonly referred to as the "forest plan"). The existing plan, written in 1986, is outdated in many ways. Natural resource and social conditions have changed, new scientific information has become available, and additional land management laws have been put into place. There have been changes in communities, economic activity, and land and resource use patterns.

According to the Forest Service planning rule established in 2012,[1] the first step in revising a forest plan is to prepare an assessment. Assessments are intended to rapidly evaluate existing, relevant information about the national forest. Covering many different topic areas, the assessment examines the ecological, economic, social, and cultural conditions, trends, risks and sustainability of national forest resources and services. This information is examined in light of its relationship to the existing land management plan, as well as the surrounding landscape. The purpose of the assessment is to provide a clear base of information for identifying what needs to change in the forest plan.

Our planning team has been gathering existing information and data, which is provided in detailed assessment reports. This document summarizes these reports and provides information to the public and our staff to help identify if and where there may be a need to change our existing forest plan.

For more information on the forest plan revision process for the Ashley National Forest, visit the Ashley National Forest's forest plan revision website at:
https://www.fs.usda.gov/main/ashley/landmanagement/planning

[1] See more about the 2012 Planning Rule at this Forest Service website: https://www.fs.usda.gov/planningrule.

Overview of the Ashley National Forest

The Ashley National Forest encompasses about 1.4 million acres in northeastern Utah and southwestern Wyoming (figure 1, page 3). The national forest is located in three major areas: the northern and southern slopes of the Uinta Mountains, the Wyoming Basin, and the Tavaputs Plateau. Elevations range from 5,500 feet on the Green River below Little Hole near Dutch John to 13,528 feet at the summit of King's Peak (the highest point in Utah). About 70 percent of the Ashley falls within the Uinta Mountains. This is the largest east-west trending mountain range in the lower 48 states and, together with the Tavaputs Plateau, provides a unique ecological transition zone connecting the northern and southern Rocky Mountains.

Established in 1908 by President Theodore Roosevelt, the Ashley National Forest was named for General W.H. Ashley who directed an expedition down the Green River in 1825.

Lands within the Ashley National Forest support a diverse range of vegetation, wildlife, geology, uses, and activities. A single day's drive takes visitors through life zones ranging from high desert vegetation to shrub-steppe and aspen zones to extensive conifer forests and high alpine ecosystems. The Uinta Mountains have a large lodgepole pine belt that is unique in Utah, as well as nearly 300 square miles of alpine habitat. The diversity of fish and wildlife species mirrors this range and diversity of ecosystems and habitats.

Geology and geomorphology are also diverse and dramatic, including broad glacial basins above treeline, steep river canyons at lower elevations, and highly dissected plateau lands in the Tavaputs Plateau portion of the Ashley. The Sheep Creek Geological Area promotes viewing and studying geology, attracting students and researchers from around the world for this purpose, as well as tourists enjoying the spectacular scenery.

Early rangers of the Ashley National Forest

The Ashley is generally considered a rural national forest with many traditional uses. Typical uses and activities include land and water-based recreation, livestock grazing, commercial timber harvest, oil and gas production, traditional hard rock mining, firewood gathering, hunting, fishing, viewing scenery, and visiting historic sites. Visitors can enjoy a variety of recreation settings, ranging from primitive to highly developed sites. Several historic guard stations are available for public rental, providing both recreational and educational experiences for national forest visitors. Historic and prehistoric cultures have used this area extensively, resulting in abundant cultural resources that span all elevations. Local Native American tribes value the lands within the Ashley for hunting and gathering activities, ceremonial and traditional uses, and ancestral connections.

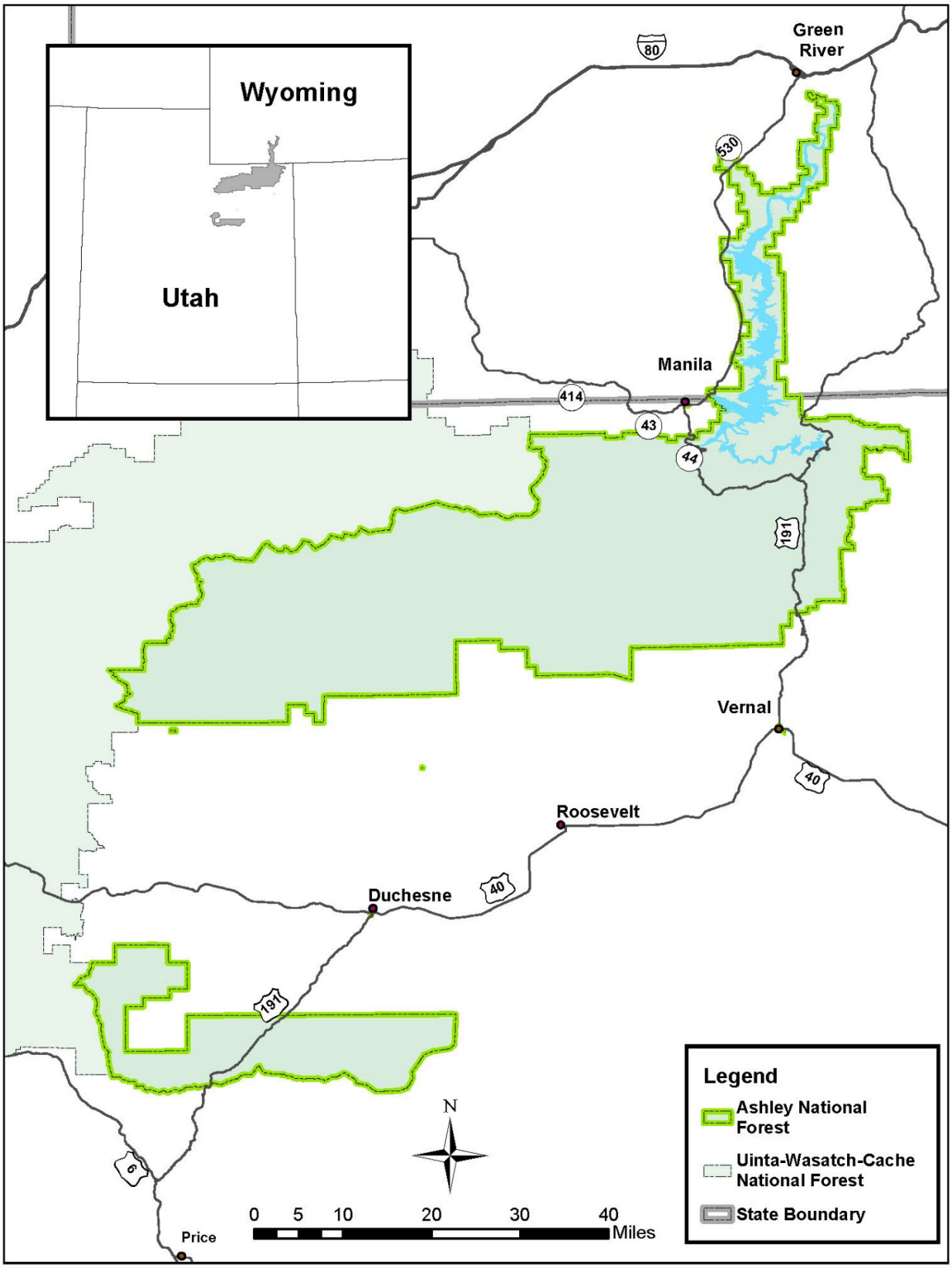


Figure 1. Location of the Ashley National Forest

Visitors to the Ashley come from all over the nation, but information about visitor use indicates that the great majority of visitors are from northern Utah and southern Wyoming. The High Uintas Wilderness, which is the largest wilderness area in Utah, and Flaming Gorge National Recreation Area are nationally designated areas that are especially popular destinations.

Large towns in Utah closest to the Ashley are Vernal, Duchesne, Roosevelt, and Manila. In Wyoming, Green River and Rock Springs are closest to the northern end of the Ashley where the Green River leads to the Flaming Gorge National Recreation Area. The Ashley National Forest falls predominantly within four counties on the northern border of Utah and southern border of Wyoming: Daggett, Duchesne, and Uintah Counties in Utah, and Sweetwater County in Wyoming. A small portion of the Ashley lies within Utah, Wasatch, and Summit Counties in Utah. In addition, Uinta County, Wyoming, is in close proximity to the Ashley. These communities and counties are connected in one way or another to the various ecosystem and economic benefits the Ashley National Forest provides.

Scope and Scale of the Assessment

The area of land within the boundaries of the Ashley National Forest are referred to as "the plan area" because these lands are the focus of our forest plan. Not all lands within the boundaries are managed by the Forest Service (officially referred to as "National Forest System" lands),[2] but because these other lands are within the national forest boundaries, they are part of the assessment area that our staff must take into account.

To more easily assess the plan area of the Ashley National Forest, many resource specialists divided it into four areas, which align with our existing ranger district boundaries. These areas are often referred to throughout this assessment as Flaming Gorge, Vernal, Duchesne-Roosevelt North, and Duchesne-Roosevelt South. These divisions are not necessarily used for all resource topics, as some specialists needed to evaluate areas based on what makes sense for their resource.

It's also important that some resource assessments look beyond the boundaries of the plan area. Management of national forest lands around and near lands of other ownerships can affect those lands, just as management of those other lands can affect the national forest. A good example of this is the assessment of social and economic conditions, where an evaluation of the conditions outside the plan area is important to discussing how the Ashley National Forest affects and is affected by those local conditions. Another example would be when considering species as potential species of conservation concern in areas next to the planning unit.

Use of the Best Available Scientific Information

During the assessment process, our specialists on the planning team sought out and used a wide range of existing, available, and relevant data and science to evaluate conditions, trends and risks to sustainability for the social, economic, or ecological systems found on the Ashley National Forest. The word "available" in best available scientific information means

[2] See the "Land Status, Ownership, Access, and Uses" section for more information on land ownerships and uses.

the information is currently available in a form useful for the planning process without further data collection, modification, or validation.

Although the best available scientific information is commonly available in the form of peer-reviewed literature, other forms include gray literature,[3] expert opinion, Federal agency inventory and monitoring data, and specialist observations. Where uncertainty exists or assumptions are made, those have been appropriately pointed out or discussed.

It's important to note that the scientific knowledge base is dynamic and ever expanding, and significant findings may be updated in the final assessment to reflect evolving scientific information. In addition, public feedback regarding the accuracy, reliability, and relevance of scientific information helps ensure the use and documentation of the best available scientific information during the plan revision process. Detailed specialist reports prepared for the assessment contain reference lists of the science and information used to support the assessment.

Public and Tribal Engagement in the Assessment Process

The Forest Plan Revision process for the Ashley National Forest began informally in the fall of 2015 when we extended an invitation to Tribes, other Federal agencies, and State and local governments to voluntarily assist with the forest plan revision process. Those that accepted our invitation to be cooperators were the States of Utah and Wyoming, six county governments, two conservation districts in Utah, and two in Wyoming. Each signed a memorandum of understanding specifying its role as an external advisor to the Forest Service relevant to the jurisdiction by law or special expertise the Forest Service doesn't have. These memoranda also outline coordination on land management planning and what would occur with these governments and agencies.

Cooperating agencies meet at key points in the process, rather than at regular intervals, to review and share information on the revision process. The agencies work cooperatively to address mutual needs, provide unique data and input, and assist with public participation all within the timeframe assigned to the forest plan revision. The agencies may provide advice and recommend direction for coordinating land management planning; however, the Forest Service is under no obligation to accept it. The authority for making the decision on the final revised forest plan lies with the Forest Service responsible official, the Forest Supervisor of the Ashley National Forest.

Our formal kickoff for forest plan revision occurred in July of 2016, when we published a notice of initiation to begin forest plan revision. We held five meetings in communities surrounding the Ashley National Forest (Vernal, Manila, Duchesne in Utah, and Green River Wyoming) and in Salt Lake City, Utah. Newspaper articles, radio announcements, community posters, and email alerts were sent out to invite the public to attend. Our first set of meetings introduced the planning process and gave an overview of the coming four years.

[3] Gray literature is scientific or technical information not available through usual bibliographic sources; it is typically created by government agencies, universities, corporations, research centers, associations and societies, and professional organizations.

The meetings were also designed to develop contacts and determine the best means to reach people and collect information on Ashley National Forest use and trends for the assessment. These opportunities, and all of the subsequent ones, let the public voice their issues and concerns. An ongoing goal for the Ashley National Forest is to increase public interest and participation in the forest plan revision process by increasing the number of people that participate during the planning period. The Ashley National Forest continues to refine means to reach people better, encouraging them to participate in the revision.

Meeting in Green River, Wyoming in August 2016

The Ute Tribe and Eastern Shoshone tribes were invited to join the Ashley National Forest as cooperating agencies in 2015, but declined. We made a presentation to the Ute Tribal Business Council in the fall of 2016. After that presentation, the Business Council invited the Ashley National Forest to return and present the information to more tribal members when the assessment was ready for public review. The Ashley National Forest will continue to actively seek tribal participation throughout the planning process and during subsequent implementation, monitoring, and adaptive management.

A second set of meetings were held at the end of August 2016 for the same communities, with a slightly different focus. These meetings provided information on the wilderness evaluation process, inviting people to use the collaborative mapping tool on the Ashley National Forest website to voice their comments on the draft wilderness inventory. People were also invited to review and comment on the preliminary list of species of conservation concern that we are required to develop for plan revision. People submitted comments on the two topics by mail, by delivery to an Ashley National Forest office, or at the public meetings.

Once the Draft Assessment Report was ready we held five public open house meetings in the summer of 2017 in the same communities as mentioned before (with the exception of Green River Wyoming, because we believed there might be more interest in the neighboring community of Rock Springs, Wyoming). We planned an open house for the Ute Tribe at Fort Duchesne community center but it unfortunately was canceled by the Tribe the day before it was scheduled to occur. We also gave our first public webinar the week after all open house meetings in case someone had been unable to attend. It was well received and indicated a growing interest in other forms of public involvement and communication. The goal of these meetings and the webinar was to share the draft Assessment Report and to encourage the public to review it and provide comments.

What we Heard from the Public on the Draft Assessment

We received 25 comment letters from the public on the Draft Assessment Report and the technical reports. Over 90 percent of the comments came in electronically by means of the "comment button" option we provided on our website. Along with these electronic comments, letters we received in the mail were scanned into an electronic format to be shared with our assessment team.

Several commenters asked for information or management recommendations that come later in the forest plan revision process, such as during the environmental analysis, decision, or objections stage. These comments will be revisited at later stages when it is more appropriate and applicable.

Many of the comments resulted in clarifying information, correcting typos and grammatical errors, and improvements to the organization of documents. Some commenters asked for more information or stated that information on a topic was lacking—often these comments could be addressed by referencing page numbers so the reader could find the information more easily. Some commenters stated there was insufficient information or a need for additional reference material. Where needed, assessment team specialists added such additional information to their reports. Some specialists determined the information would be more applicable during the environmental analysis process.

In general, changes to this assessment report included:

- Clarifications and corrections
- Information added in the "Social and Economic Conditions" section
- Data corrected in the "Rangelands and Grazing" section
- Species of interest section moved to the "Social, Cultural, and Economic" section
- The final designation of species of conservation concern by the Regional Forester
- The addition of bighorn sheep to the list of species of conservation concern
- Addition of an "Inventoried Roadless Areas" section

Next Steps

Our next step is to provide a preliminary "Need for Change" report, outlining which components of the current plan need to change. We will solicit comments and feedback on this as well, which will help us prepare our proposed action for developing a revised forest plan.

While gathering comments on our need for change, the Ashley National Forest Collaboration Specialist will begin hosting "hot topic" workshops to dive deeper into some of the larger issues the public and Ashley National Forest are addressing. These workshops will invite people to exchange ideas, discuss current situations with experts in various fields and with the people in surrounding communities. The workshops will be focused on the most common issues the public feels should be part of the Ashley National Forest's future direction. Understanding future options will help everyone address the desired future conditions that must be part of the new plan and the other parts of the plan needed to achieve these conditions. We hope to encourage early involvement and ongoing involvement, so people can influence the plan that will be used on the Ashley National Forest for the next 15 years.

Going forward, several options exist for the public to review and comment on additional documents, such as the forest plan, the associated environmental impact statement, and the plan monitoring program. An official launching of forest plan revision will begin with the release of a “notice of intent” in the Federal Register. Providing comments after that time during officially designated comment periods will be important for ensuring your voice is heard. Watch for announcements on the Ashley National Forest webpage at:

https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713.

Assessing Terrestrial and Aquatic Ecosystems

As part of the planning rule requirements for assessments, planning teams must evaluate ecological sustainability and the diversity of plant and animal communities. Ecological sustainability refers to the capability of ecosystems to maintain integrity—that is, to be able to withstand and recover from events such as drought, severe fire, floods, or human-caused impacts and still maintain characteristics, processes, and functions that have naturally occurred over time (referred to as "the natural range of variation").

Many things influence how ecosystems function and change—these include natural processes such as plant succession, seasonal weather, wildfire, animal migrations, or native insect outbreaks. Ecosystems are also influenced by "stressors"—factors such as uncharacteristic wildfires, invasive species, warming temperatures due to climate change, or other human impacts, all of which may degrade or impair ecological integrity.

This section summarizes the more detailed assessment reports for resources that contribute to ecosystems and watersheds in the Ashley National Forest, providing information on existing conditions and trends of those resources and the current and potential management challenges of the Ashley National Forest. The complete detailed resource reports are available on the Ashley National Forest website at: https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713.

Air Quality

When people think about resources and benefits that national forests provide, they tend to think of tangible things, such as trees, water, wildlife, or places to recreate. People may not always think about air. Yet, the Forest Service is responsible for helping to meet standards to protect and maintain air quality—a resource we share across many boundaries. Clean air in the national forests not only enhances scenic views and the overall outdoor experience, it contributes to healthy ecosystems.

Good air quality contributes to healthy ecosystems and enhances scenic views like this one in the Uinta Mountains

Poor air quality can affect national forest resources in several ways. Aside from visibility, air filled with smoke, dust, and pollution can affect public health, water quality, aquatic organisms, cultural resources, and wilderness areas. Air pollution can contain particulate matter that affects breathing, toxic metals that can affect soils and water, and gases like carbon monoxide that can influence ozone levels, which can cause stress to sensitive ecological systems.

Rules and Regulations That Help Keep Our Air Clean

The Clean Air Act of 1963 and its subsequent amendments provide the primary legal and regulatory framework the Forest Service must follow when it comes to managing air quality of national forest lands. The act requires that we comply with all Federal, State, and local air quality rules and regulations. There are also special regulations that pertain to preserving and protecting air quality-related values, including visibility, in wilderness areas.

While stationary sources were the initial focus of the Clean Air Act, pollutants from regional-scale area sources (such as oil and gas production) are more likely to affect national forest areas. Global emissions of carbon dioxide and other greenhouse gases are increasing in concentration, and very likely causing changes in climate. The effects from a changing climate are producing unanticipated changes to national forest areas.

Amendments to the Clean Air Act in 1977 established air quality areas where emissions of particulate matter and sulfur dioxide are to be restricted. These are referred to as Class I, II, and III areas, with Class I being most restrictive on emissions released. All areas of the Ashley National Forest are considered Class II areas[4], including the High Uintas Wilderness.

Under the Clean Air Act, an area that violates national ambient air quality standards for any of the six criteria pollutants listed is designated as a nonattainment area. Areas in and around the Ashley National Forest and Flaming Gorge National Recreation Area are currently in attainment of all standards. However, the Uinta Basin is under review by the Environmental Protection Agency for wintertime ozone levels. It is possible that portions of the Uinta Basin may be designated with some level of nonattainment status in the future.

It's important to note that air quality on national forest lands is highly affected by prevailing winds and sources of emissions that affect air quality. National forest managers can't do much about air pollution, smoke, dust, or haze that drifts into the air above national forests. However, we are required to evaluate permits for emission-producing facilities outside national forest boundaries that have the potential to affect the air quality within national forests. We also are required to control sources of emissions that are generated on national forest lands. These can include such things as smoke from prescribed fires or dust from management activities. Coordinating with local and regional air quality agencies is key in these situations.

[4] A Class II area relates to pollution amounts under the 1977 amendment to the Clean Air Act. Wilderness areas established since August 7, 1977 - regardless of size - are Class II areas (areas larger than 5000 acres which existed before August 7, 1977 are Class I). Class II areas allow larger pollution amounts than Class I.

Current Air Quality Conditions and Trends

Compared to many areas in the country, air quality in and near the Ashley National Forest and Flaming Gorge National Recreation area is good to excellent. The area is minimally developed, has limited local emissions sources, and predominantly very robust air dispersion. The Ashley National Forest is in conformance with current national ambient air quality standards.

The greatest threat to air quality on the Ashley is from human-generated sources outside the national forest. Urban, industrial, oil and gas production, and agricultural air pollution, from both upwind and surrounding source areas, have a potentially persistent impact because many of these emissions occur year-round. These sources are managed to varying degrees by air quality regulatory agencies in Utah and Wyoming, and other upwind states. Potential future sources of emissions that could impact the Ashley National Forest are continued growth in the Wasatch Front metropolitan area and continued energy development in the Uintah Basin and southwest Wyoming.

Wildfire emissions can be an unpredictable and significant source of pollution within and around the Ashley National Forest. The emissions are not controllable by management except indirectly, through fire suppression, fuels management projects, and other ongoing activities. Climate change analyses for national forest lands indicate increasing temperatures and the effects of decades of fire exclusion increases the potential for large, more severe wildfires. These kinds of events can result in negative effects to air quality for long periods.

Smoke from prescribed fires occur during the spring and late fall. Smoke management is regulated by permit from the states of Utah and Wyoming, and prescribed burning cannot occur without coordinating the timing with State air quality regulators. Air quality impacts from other resource management activities, such as dust from logging roads and recreational use of system roads, are generally small and inconsequential. Such impacts are not a concern at the forest planning level.

Smoke the Forest Service produces from prescribed fires is regulated by permit from State air quality regulators in Utah and Wyoming. Prescribed burning cannot occur without coordinating with those agencies.

Monitoring indicates visibility is not being impacted by regional haze in the High Uintas Wilderness. However, there is a growing body of evidence from research and monitoring that atmospheric deposition of nitrogen in high mountain lakes (many of which are in the High Uintas Wilderness) is a reason for managers of the Ashley National Forest to be concerned. This deposition of nutrients is traced to upwind and surrounding sources. The research suggests acidification of surface waters and forested ecosystems is not a concern, but deposition of nitrogen (both nitrates and ammonium) and phosphorus are. The deposition appears to be having an effect on sensitive high-elevation lake water chemistry and possibly aquatic organisms. The deposition does not currently appear to be affecting herbaceous plants and shrubs, forests, lichens, fungi, and leaching of nutrients.

Another potential concern is deposition of dust from off-Forest sources and its effects on high elevation lakes, water yield, and timing of flows. Research Indicates windblown dust can speed the melting of mountain snow packs and alter the timing of spring runoff. Metals and

other elements can be carried long distances in the dust with a potential to influence aquatic life.

Conclusions and Future Considerations

Current forest plan direction emphasizes management that:

- integrates air resource management objectives into all planning and management activities;
- preserves and protects air quality-related values in wilderness and the Flaming Gorge National Recreation Area and establishes limits of acceptable change;
- mitigates adverse impacts from prescribed fire;
- monitors effects of air pollution and atmospheric deposition on national forest resources; and
- reviews permits for proposed pollutant emitting facilities, their potential effect on air quality related values, and makes recommendations to State air quality regulatory agencies.

Current conditions indicate forest plan direction is still valid. However, there is concern about potential future sources of emissions, primarily from the Wasatch Front metropolitan area and continued energy development in the Uintah Basin and southwest Wyoming. Climate change could also have negative effects on air quality, as it affects the potential for more frequent large and severe wildfires.

Additional Information

Bevenger, Greg. 2017. Ashley National Forest Assessment Air, Soil, and Watershed Resources Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Soil

Soil is a key foundation of ecosystem function. It acts as a growth medium and provides nutrients for vegetation. It stores and filters water, breaks down organic and inorganic matter, and recycles dead plant and animal matter into nutrients for other living things. It contains habitat for numerous organisms that cycle nutrients and carbon, and provides a long-term carbon storage reservoir.

The objective of soil management on national forest lands is to maintain or restore soil quality, minimize damage and disturbance, and manage resource uses to sustain ecological processes and functions. Soil quality is a term that describes the ability of soil to support a range of ecosystem functions and human uses. Soil quality depends on both the inherent capability of the soil, and the changes in soil properties created by current soil conditions.

Soil quality also depends on interacting physical, biological, and chemical properties of soils. These include soil structure, organic matter, nutrients, and biotic processes. Soil quality is impaired when a soil property is altered beyond the soil's resilience to quickly recover. Severe disturbances can impair soil quality by heating, displacing, compacting, or eroding the soil.

A variety of activities and uses of the Ashley National Forest can have detrimental effects on soils if not properly managed. Recreational activities, construction, road maintenance, oil and gas development, timber harvest, and livestock grazing may result in soil disturbance, including soil compaction, erosion, soil mixing, sediment delivery into streams, and loss of vegetation. Events like wildfires, debris flows and landslides, and floods can also result in impacts to soils.

At the national forest level, protection of soil quality is focused on four areas:

- Improving the soil resource where it has been impacted by poor management practices or activities not suited for the area;
- Rehabilitating soils where they are affected by natural disturbances (such as severe wildfires);
- Maintaining the soil resource by prescribing soil and water conservation practices; and
- Evaluating the potential for management activities to cause significant impairment of soil properties and productivity of the land.

Current Soil Conditions and Trends

The greatest threat to soil quality is soil erosion, because when soil is lost from a site, it cannot be replaced during human timespans. Erosion removes topsoil, which contains most of the soil's nutrients, carbon, organic matter, and microorganisms. Compaction is also a concern. When soil is compacted, its porosity is reduced, restricting its air and water-holding capacity. Some soil types like those in alpine zones, riparian areas, and wetlands are more sensitive to disturbances than others. Activities such as timber harvest, road construction, livestock grazing, and off-road vehicle use are examples of national forest uses that require special measures to protect and maintain soil quality and productivity.

Soil and vegetation health are closely tied. Changes can occur when vegetation is damaged or replaced by invasive species. Plant cover and composition, roots, and organic additions impact soil properties. Plant cover protects soil from erosion, regulates soil temperature, and

adds organic material into the surface soil. Plant roots add organic material, increase soil stability, and provide sites for microorganisms and nutrient cycling. Changes or damage to vegetation will impact the soil and its ability to support productive plant communities.

Specific soil quality concerns on the Ashley National Forest include the following:

- Soil disturbance from vegetation management activities including road, trail, and timber landing construction;
- Increased cross-country use of off-road vehicles outside of established roads and trails;
- Dispersed and heavily concentrated recreation activities causing soil and vegetation damage in forested, wetland and meadow areas;
- Cattle and sheep use along riparian corridors and at concentrated use areas like bedding grounds, watering troughs, and stock driveways;
- Debris flows and slope failures in conjunction with fires and irrigation ditches;
- Burning large slash piles during fuel reduction and timber harvest projects;
- Surface soil loss in areas burned by severe wildfires;
- Land areas becoming dominated by invasive weeds, particularly cheatgrass and Halogeton;
- Impacts from oil and gas development including high road densities, soil mixing, loss of surface soil, and invasive plants spreading to undisturbed sites;
- Surface soil loss in old lodgepole pine clearcuts due to insufficient effective ground cover and lack of organic matter on the soil surface;
- Management activities damaging saturated soils and ground water flow in areas of seasonal or permanent high water areas;
- Management activities damaging vegetation and soils in rangelands and desert shrublands; and
- Atmospheric deposition of elements in alpine areas, increasing levels of metals, salts and nutrients – including phosphorus - that effect soil chemistry and productivity.

Burning large slash piles after timber harvest can impair the productivity of the soils beneath them

Conclusions and Future Considerations

Protecting soil resources to maintain soil quality on the Ashley National Forest will mainly depend on three factors: protecting the health of native vegetation communities, maintaining organic additions to soils, and preventing erosion loss of the biologically active surface soil. There have been timber and watershed projects in recent years that were beneficial to maintaining soil quality. These include use of lop-and-scatter thinning treatments in lodgepole pine stands, where slash and woody debris added to the forest floor increased soil organic matter and carbon stocks. Meadow hydrology restoration projects have also stabilized soils and allowed revegetation of damaged meadow areas.

Impacts to soil resources will likely increase in the near future, particularly from recreational use, oil and gas development, and from the loss of native vegetation to annual invasive species. Another impact on soil resources that may continue or increase is the stress to soils related to climate variability, which affects vegetation, ground cover, fuel loads, and the risk of severe wildfires. The current forest plan does not provide information on soil properties and processes to maintain soil quality or standards and guidelines to protect the soil resource.

Impacts to soil resources will likely increase in the near future, particularly from recreational use, oil and gas development, and from the loss of native vegetation to invasive plant species.

In timber harvest areas, soils will continue to have some detrimental disturbance from compaction and erosion. The current monitoring of timber harvest operations will need to be continued to ensure enough organic cover, including coarse woody debris, is left to protect the forest floor from erosion and to maintain forest productivity.

In recreation areas, soils will continue to have compaction and erosion as the trend toward dispersed camping and motorized cross-country off-road vehicle use continues. Impacts to soils in the Flaming Gorge area will include the loss of physical and biological crusts that provide soil stability and an increase in the area impacted by annual invasive species.

Where grazing occurs in alpine areas, soils are expected to remain stable in sheep bedding and trailing areas. Lower elevation range areas where drought cycles will continue and where cheatgrass is increasing will have a corresponding decrease in soil quality from reduced organic additions and increased rates of soil erosion.

Oil and gas development will continue to cause loss of surface soil from poor stockpiling practices, soil mixing, and the constant erosion off pads and roads. Interim reclamation done on some sites may begin to stabilize and improve soils on some oil pad berms.

Additional Information

Bevenger, Greg. 2017. Ashley National Forest Assessment Air, Soil, and Watershed Resources Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Aquatic and Riparian Ecosystems

Without water, very little survives, making aquatic and riparian (streamside) ecosystems important resources provided by national forests. Protecting water quantity and quality, the timing of flows, and national forest watersheds is critical to sustaining ecosystem functions of the Ashley National Forest and providing water resources for visitors, communities in the surrounding areas, and aquatic and terrestrial plants and animals.

Aquatic and riparian ecosystems consist of lakes, streams, rivers, ponds, wetlands, groundwater, and the biological communities that rely on them. On the Ashley National Forest, these systems are assessed by five key ecosystem characteristics:

- The distribution, timing, and quantity of water across the national forest
- Channel, floodplain, and sediment dynamics
- The composition and condition of riparian and wetland vegetation and soils
- Invasive and encroaching species
- The connectivity of aquatic habitat (the ability of aquatic species to move to different areas to use habitat that fulfills their life cycle needs)

The Clean Water Act is the primary legislation guiding protection of water on national forest lands, much of which is regulated by the States. In regards to national forest management, these regulations focus on maintaining water quality; preventing sediment and pollutants from entering lakes, streams, and waterways; and providing for beneficial uses (such as drinking water, swimming, fishing, aquatic wildlife, agriculture, and other uses). Best management practices are proven measures designed to protect water and watershed resources during management activities when properly implemented and monitored.

Current Aquatic and Riparian Conditions and Trends

The Ashley National Forest generates approximately 1 million acre-feet of water annually to streamflow and contributes a large, but unmeasured, quantity of water to multiple groundwater aquifers. A portion of this water is used by wildlife, aquatic species, livestock, the recreating public and administrative uses across the Ashley, but the majority of the water flows downstream and off the national forest. A small portion of the water is used on private lands within the Ashley National Forest administrative boundary. Availability and distribution of water are key factors of aquatic ecosystems.

How stream channels are shaped and what they contain influence downstream movement of water and habitat for aquatic species. Sediment in a stream can be as large as boulders and cobbles or as small as silts or clays. Along with other structural features, such as dead trees and riparian vegetation, sediment can be an important habitat component for fish and other aquatic organisms.

The connection between waterbodies and their surrounding floodplains sustains riparian zones and wetlands. Floodplain riparian zones, in turn, provide important ecological functions. These include storing surface water; maintaining a high water table; maintaining streambank stability and channel function; and filtering sediment, nutrients, and pollutants that originate from upland areas.

Groundwater Resources

Groundwater resources of the Ashley National Forest are very important to local ecosystems, as well as agriculture and local communities. Most notable are multiple springs, some very large, associated with carbonate rocks along the northern and southern boundaries of the Uinta Mountains. Streams at higher elevations lose water into the carbonate rocks through karst features (sinking and disappearing streams, caves, sinkholes, and springs). The same water then resurfaces at large springs at lower elevations.

Groundwater resources of the Ashley National Forest are very important to local ecosystems, as well as agriculture and local communities.

Seeps, springs, and wetlands are important groundwater resources on the Ashley. These wet and saturated areas provide habitat for communities of plants, animals, and other organisms whose existence and distribution depend on the availability of groundwater. These communities are known as groundwater-dependent ecosystems and they are influenced by the timing, duration, and magnitude of groundwater flow.

Canals and Dams

Canals and dams are prominent hydrologic features in many locations. There are 32 actively operating dams on the Ashley National Forest of a size that requires engineer inspection. The largest of these create the Flaming Gorge, Moon Lake, and Upper Stillwater Reservoirs. Since 2007, 13 small dams were removed in the High Uintas Wilderness as part a project that transferred water rights to downstream reservoirs. Thirty-one irrigation pipelines and canals operate under special use permits. One pipeline is a trans-basin diversion, which routes water from Lower Stillwater Reservoir on the Rock Creek drainage to Strawberry Reservoir for use on the Wasatch Front.

Riparian Areas and Wetlands

Riparian and wetland vegetation are important components in riparian and aquatic ecosystems. Riparian and wetland plants stabilize streambanks shade water, and help provide habitat for aquatic organisms, including Colorado River cutthroat trout, and other coldwater fish. Riparian areas can reduce damage from floods by stabilizing soil, dissipating stream energy, and trapping sediment. Fallen logs near streams and in wetlands provide cover, thermoregulation, and foraging sites for terrestrial and aquatic wildlife. Shrubs, forbs, and grasses in riparian and wetland area are used as forage by wildlife and livestock.

Riparian vegetation along streambanks helps prevent erosion and provides cover for fish and other aquatic species

Due to their dynamic nature, high productivity relative to upland ecosystems, and sensitivity to disturbance, riparian areas and wetlands are vulnerable to colonization by invasive plants. Invasive plants can damage wildlife habitat and degrade soil and water quality in riparian and

wetland settings. Aquatic invasive species (like quagga and zebra mussels) can change the productivity, species diversity, water chemistry, and habitat value of waterbodies. They can outcompete native species, change the nutrient content of water, and impair habitat structure. Portions of the Ashley National Forest also contain aquatic nuisance species including the parasite that causes whirling disease, New Zealand mud snail, chytrid fungus, didymo (an invasive algae), and curly leaf pondweed.

Notable Fish Species on the Ashley National Forest

Colorado River Cutthroat Trout

The Colorado River cutthroat trout is a species of conservation concern found in many streams of the Ashley National Forest. One of its primary threats is the existence of nonnative trout. The Colorado River cutthroat trout requires cool, clear water, deep pools and boulders, and well-vegetated streambanks for cover. Although most of its habitat is in good condition, there are areas where erosion caused by overgrazing and unauthorized off-road vehicle use have impacted their habitat by adding sediment to streams. The potential for climatic changes causing warming temperatures and resulting effects to seasonal stream flows could impact this trout's habitat in the long term.

Colorado River cutthroat trout, a potential species of conservation concern

Valued Sport Fish

The Flaming Gorge Reservoir offers outstanding world-famous fishing. World- and state-record trout have been caught in these cold waters. There are numerous fishing derbies to participate in throughout the summer and winters seasons and ice fishing is becoming increasingly popular. Species present in the reservoir include rainbow, cutthroat, brown, and lake trout; kokanee salmon; smallmouth bass; channel catfish; and most recently, burbot.

Since completion of the Flaming Gorge Dam in 1962, the Green River below the dam has become a premier trout fishery. Anglers can float the river in dories, rafts or kick boats, and there is foot access to the river from the Little Hole National Recreation Trail, which runs between the Spillway and Little Hole boat launch sites. Species present in the river are rainbow, brook, and cutthroat trout.

In addition to Flaming Gorge Reservoir and the Green River, the Uinta Mountains offer outstanding stream and lake fishing for many of the species listed above. Hundreds of lakes in the Uinta Mountains, including in the High Uinta Wilderness area, offer opportunities for anglers to experience an outstanding fishing experience in the solitude of the backcountry and wilderness. For quicker and easier access by automobile, stream fishing on rivers such

as the North Fork of Duchesne, Lake Fork, Uinta, and Whiterocks Rivers is readily available. Sport fishes typically caught in these rivers are rainbow, brook, brown, and cutthroat trout.

Watershed Conditions

To evaluate watershed conditions and help prioritize which watersheds need restoration, the Forest Service uses a process called the Watershed Condition Framework. As part of this process, we evaluated 107 watersheds (approximately 99 percent of the Ashley National Forest) to determine how well they are functioning in relation to water quality and quantity, channel function, aquatic and terrestrial habitat conditions, and all the environmental factors that can influence the state of a watershed. Based on the findings, watersheds are classified as "functioning properly," "functioning at risk," or having "impaired function" (these are shown as "good," "fair," and "poor" in the chart below).

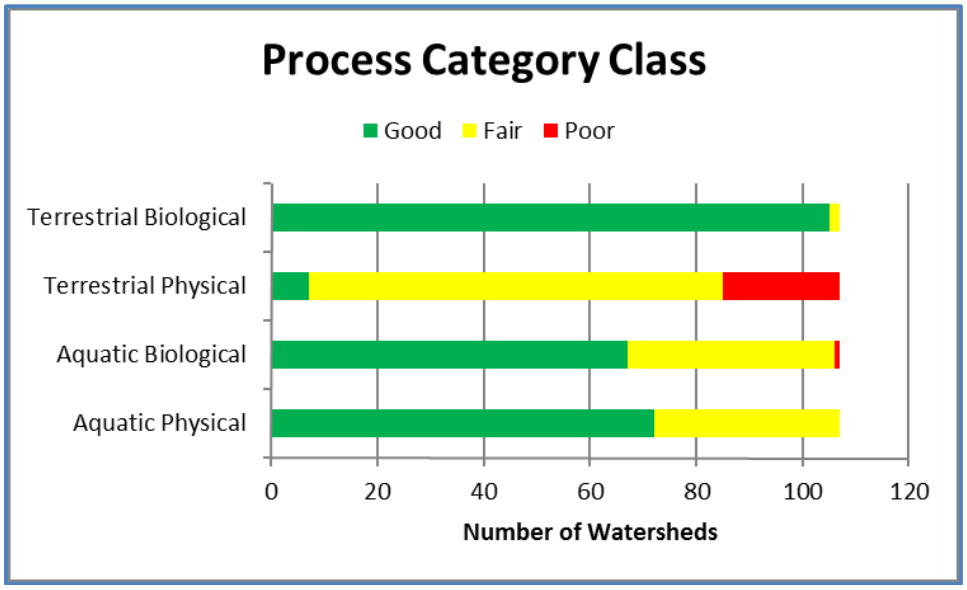


Figure 2. Numbers of watersheds and their condition ratings for terrestrial biological and physical conditions, and aquatic biological and physical conditions

Of the 107 watersheds evaluated in 2011, 57 (53 percent) were functioning properly and 50 (47 percent) were functioning at risk. No watersheds were rated as impaired overall. However, of watersheds functioning at risk, 22 had impaired function due to roads and trails having impacts to water. One stream (Marsh Creek) had impaired function due to its poor riparian condition and loss of native species.

Of the 107 large watersheds evaluated in 2011, over half were in good condition, and the rest were in fair condition. No watersheds were in poor condition.

Areas of Concern

The Watershed Condition Framework evaluation indicated 47 percent of Ashley National Forest watersheds are functioning at risk. Specific concerns related to aquatic and riparian ecosystems include the following:

- Domestic water, irrigation, and livestock developments can impact both surface and groundwater flow regimes and water quality.
- Timber harvest and associated road and trail construction can affect peak flows, stream channel functions, and potential sediment delivery to streams.
- Increased use of off-road vehicles can remove vegetation, compact and rut the soil, and cause sediment delivery to streams.
- Culverts at road-stream crossings can be barriers to fish moving upstream.
- Historic and present livestock use affects stream channels, riparian areas, upland areas, and water quality.
- Dams and water diversions can affect hydrologic processes of streams, resulting in changes to the active stream channel, floodplain, and riparian zones downstream.
- Oil and gas development cause ground disturbance and potentially affect water flows and sediment delivery in streams.
- Severe wildfire can increase flooding, erosion and destabilize stream channels.
- Atmospheric deposition of nutrients, particularly nitrogen and phosphorus, can affect water chemistry and aquatic biota.
- Climate change may cause earlier peak flows and reduced streamflow during the summer—a time when human, agricultural, and ecological needs are greatest.

In some locations of the Ashley National Forest, channel, floodplain, and sediment dynamics have been affected by roads, dams, water diversions, mining, grazing, and timber activity. Some stream reaches and wet meadows have downcut, which reduced floodplain capacity. Improvements in grazing management since the early 20th century have increased vegetation cover in uplands and riparian areas of allotments. In the 1980s, a series of channel structures were installed in gullied streams of the South unit of the Duchesne-Roosevelt District with localized success at increasing water tables and floodplain width. Increased beaver activity in Timber Canyon since the 1980s has benefitted floodplains and gullied stream reaches. Restoration projects are currently planned at four meadow stream sites in the Vernal and Flaming Gorge Ranger Districts.

Some segments of irrigation canals on the Ashley National Forest have been converted to pipeline, including the Sols Canyon and Mosby Canals in the 1990s and the Oaks Park Canal in 2007. This reduced flood risk from canal breaching and returned natural flow patterns to these areas. Dams on the Ashley have displaced riparian vegetation with their reservoir pools and caused some changes to riparian zones downstream. Since 2006, the Bureau of Reclamation manages spring releases from Flaming Gorge Dam to simulate natural high flows in support of endangered fish species downstream in the Green River. Simulated high flows also assist maintenance and recruitment of riparian species such as cottonwood. The removal of 13 small dams in the High Uintas Wilderness provided an ecological benefit by stabilizing lake levels and returning flow patterns in drainages to more natural conditions.

Unauthorized off-road use by motorized vehicles continues to be a challenge in wet meadows and riparian areas, particularly in the eastern Uinta Mountains. In recent years, we have improved and relocated segments of National Forest System roads and motorized trails away from wet meadows on the Vernal and Flaming Gorge Ranger Districts. We are also annually targeting closures of unauthorized routes.

Oil and gas development in the South Unit has increased in the past decade, with a growing number of oil well pads and access routes. Operating requirements have been established for the siting and design of well pads and access routes. The requirements include buffer distances from channels and erosion and spill controls to reduce potential impacts from development.

Future warming and potential drying as a result of climate change has the potential to inhibit the survival and growth of riparian and wetland plants. Wetland and riparian zones at middle to lower elevations of the Ashley National Forest (especially those fed by seasonal and intermittent water sources) would have greater vulnerability to a warming and drying climate. Predicted trends in precipitation and streamflow may influence the distribution of groundwater-dependent vegetation, especially if summer baseflows decrease. Increased grazing pressure on groundwater-dependent ecosystems from livestock and wildlife such as elk or deer may result from warmer and drier summer conditions as upland forage sources are diminished.

There has been a marked expansion of terrestrial invasive plant species in lower elevations of the Ashley National Forest. This expansion occurred following drought years in 2002, 2012 and 2013. Invasive plants can reduce the biodiversity of plant communities and reduce canopy cover, leaf litter, and root size and density, leaving soils more prone to erosion and increased potential for stream sedimentation.

Photography of areas over time in mid- and high-elevation meadows on the Ashley National Forest has documented an increase in young conifer trees along the perimeter of wetland meadows. In some areas, the conifer encroachment is significant, and management actions may be necessary to maintain the meadows. Encroaching species have the potential to crowd out riparian plants and affect animals that depend upon grasslands or deciduous trees for their habitat.

Overall, aquatic habitat connectivity is in good condition, with some site-specific areas across the Ashley National Forest that need attention. In 2005, Ashley National Forest specialists surveyed 26 stream crossings to determine if fish movement in streams was blocked by barriers such as poorly placed culverts. Fifteen stream crossings (57 percent) had some sort of passage barrier (usually culverts) for adult fish. Since 2005, culverts have been replaced on 5 of the 26 (19 percent) streams surveyed. Barriers such as dams, hanging culverts, and water diversions can isolate fish populations, limiting gene flow and potentially reducing population viability. Isolated populations often have reduced access to suitable food sources and habitat and their inability to migrate to new areas after large disturbance events makes them vulnerable to localized extinction.

Overall, aquatic habitat connectivity is in good condition, with some site-specific areas that need attention across the Ashley National Forest.

Based on a study specific to the Ashley National Forest, watersheds on the national forest are moderately to highly vulnerable to the effects of climate change. Since 1970, average annual air temperature has increased 0.5 degrees Fahrenheit. Studies indicated more precipitation is falling as rain rather than snow, resulting in earlier snowmelt and runoff. Projected increases in drought, heat, flooding, evaporation, snowpack loss, and earlier snowmelt could shift the timing of runoff and reduce stream flows. Climate change effects to watersheds could also be compounded by increases in severe fires, insect epidemics, and invasive species, as well as increasing water demands by people.

Conclusions and Future Considerations

The existing plan emphasizes increasing water yield through vegetation manipulation. This emphasis was related in part to the understanding of the science at that time. Over time, the science has advanced, and agency policy has changed as a result. Additionally, the existing forest plan does not have direction for addressing groundwater resources and groundwater-dependent ecosystems.

As mentioned previously in the soil and air quality sections, there may be a developing concern with atmospheric deposition of nitrogen and its effects on water chemistry. Continued monitoring is needed to confirm or dispute this potential concern. Additionally, climate change could have negative effects on watersheds and water resources.

Although best management practices are used to protect water and watersheds, formal and informal monitoring indicates the practices are not always fully and properly implemented at the project level.

Additional Information

Plunkett, Christopher. 2017. Ashley National Forest Assessment Aquatic Ecosystems Report. Ashley National Forest Supervisor's Office, Vernal UT.

Bevenger, Greg. 2017. Ashley National Forest Assessment Air, Soil, and Watershed Resources Report. Ashley National Forest Supervisor's Office, Vernal UT.

Both reports are available on the Ashley National Forest planning website: https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Terrestrial Ecosystems

The terrestrial or "land-based" ecosystems of the Ashley National Forest are very diverse. Influenced by the shape of the land, precipitation, soils, geology, and elevation, the Ashley terrestrial ecosystems range from sagebrush and desert shrub plateaus to aspen stands, coniferous forests, and high mountain alpine ecosystems. These distinct areas provide habitat for many different species, as well as a variety of environments that people work and play in.

Rare Habitat Types

Although there are numerous types of plant communities on the Ashley National Forest, fens are one habitat type that are often rare because of their limited distribution and presence on the landscape. Such communities tend to have exceptional or extraordinary qualities that further distinguish them from others, and they are often more susceptible to disturbances and stressors that could threaten their integrity or existence. Recognizing and managing for rare and unique habitats conserves landscape diversity, contributes to the integrity of broader ecological systems, and promotes sustainability of existing forest resources. Out of 18 habitats evaluated, three areas of fens qualified as rare and unique.

Fens are a high-nutrient type of wetland fed by groundwater. They provide important benefits such as preventing or reducing the risk of floods and improving water quality.

Fens are a high-nutrient type of wetland fed by groundwater. They are often covered by grasses, sedges, rushes, mosses, and wildflowers. Fens provide important benefits that include preventing or reducing the risk of floods, and improving water quality. Although disturbances like timber harvest, livestock grazing, and avalanches could occur, none of the Ashley fens has been severely impacted by these stressors. However, these fens could be affected by increasing temperatures and decreasing precipitation in the future. On the Ashley National Forest, three types of fens are considered unique and rare habitats.

Sheep Creek Park fen

Current Conditions and Trends of Fens

Calcareous or "Rich" Fens – There is one calcareous fen on the Ashley National Forest located in the South Fork Rock Creek drainage in the Duchesne-Roosevelt Ranger District. These types of fens are very alkaline with high dissolved mineral levels. Plant species richness is very high (about 80 plant species documented), and the composition and structure of plants has remained constant. Long-term monitoring indicates the fen is in good condition with stable trends for at least 20 years. Given these conditions, the fen is likely to have a moderate to high conservation ranking. Two potential plant species of conservation concern, handsome pussytoes and wetland kobresia, are found in the fen.

Glacial Canyon Fens – In the Uinta Mountains, there are fens (also considered "peatlands") found in glacial canyons at elevations between 7,200 and 8,500 feet. These are located within or next to forested areas and are fed by small springs or aquifers found near the base of canyon slopes. Like the calcareous fen, long-term monitoring has shown that all but one of these are within the natural range of variation and showing stable trends for 20 years. The fen in Whiterocks Canyon has been slightly degraded due to a road that crosses the fen. One potential plant species of conservation concern, bristlestalked sedge, grows here.

Limestone Fens - A few fens with limestone influence are found in Sheep Creek and Hickerson Parks in the Flaming Gorge Ranger District. The fens are found within depressions, are relatively flat, and are fed by underground springs. Hummocks and boggy areas also occur and provide niches for some plant species. No other fens meeting this description are found within or outside the plan area in the Uinta Mountains. Two potential plant species of conservation concern, wetland kobresia and silvery primrose, are found here. Based on the condition of this fen, it would likely have a high conservation ranking.

Terrestrial Vegetation Communities

There are six primary vegetation community types on the Ashley National Forest: alpine vegetation, aspen stands, conifer forests, sagebrush communities, pinyon-juniper woodlands, and desert shrub. These communities naturally vary because of factors such as precipitation, elevation, topography, and soils. Yet each community has been affected in one way or another by changing conditions and trends of the Ashley National Forest environment since the forest plan was written.

One thing the vegetation types all have in common is the potential effects from climate change. A warming climate may change precipitation patterns across the landscape, causing drought in some areas and snowmelt to occur earlier in others. A warming climate has caused forests to advance into the alpine areas or become denser at the treelines. Climate change effects may also result in more frequent and larger wildfires.

Current Vegetation Conditions and Trends

Alpine Vegetation

These high mountain plant communities consist mostly of low-growing, small plants that are adapted to surviving harsh environmental conditions. Human-caused effects are minimal in most alpine areas, but a couple of biological trends are changing alpine community dynamics. There is an increase in density and canopy cover of low willow in many alpine communities, both wet and dry, that has been documented for at least 50 years. Another notable trend is an increase in the number of conifers growing in low willow communities, moist meadows, and a few riparian areas at or near timberline.

Alpine vegetation is often low growing and able to withstand harsh environmental conditions

Long-term monitoring has detected more conifer trees appearing higher on slopes since 1870. Pocket gopher activity in the Uinta Mountains is also an inherent disturbance and is considered a major factor controlling plant community dynamics and ground cover in select alpine communities.

Through browsing, elk and moose have diminished shrub canopies in a few low willow subalpine communities, but no decreases in alpine communities have been documented because of this. Steady upward trends in populations of these animals are considered a potential stressor of alpine communities.

Aspen Stands

Two types of aspen stands are generally recognized for the way they grow in succession with other tree species. “Seral” aspen stands are known to grow in groups and clumps among conifer species like lodgepole pine, Engelmann spruce, subalpine fir, Douglas fir, ponderosa pine, and blue spruce. Over 75 percent of aspen on the Ashley National Forest is classified as seral. “Persistent” aspen consist of large stands of aspen that tend to exist at lower elevations with very few conifer trees present. These aspen stands account for about 25 percent of all aspen within the plan area. Aspen stands are best maintained by fire and timber harvest, which help promote regeneration.

Examples of seral aspen (top) and persistent aspen stands (bottom)

Current monitoring indicates seral aspen stands are diminishing within the plan area and are being displaced by conifer trees. There is even greater risk for aspen loss under broad-scale fire suppression policies and continued reduction in timber harvest. On the other hand, persistent aspen has remained on the landscape at levels equal to or greater than the beginning of the last plan period. However, if elk populations increase in the coming decades, more aspen stands within the plan area would be susceptible to elk browsing following disturbances. This may threaten successful aspen recruitment and diminish aspen

persistence, but current long-term monitoring shows aspen stands on the Ashley National Forest to be quite resilient to natural and human-caused stressors and disturbances.

Conifer Forests

Conifer forests consist of cone-bearing evergreen trees—what some people think of as pines and firs. On the Ashley National Forest, there are five major types of conifer forest: mixed conifer, Engelmann spruce, lodgepole pine, Douglas-fir, and ponderosa pine. Some of these have aspen mixed in. There are also small areas of conifers that are not common enough to be considered a dominant vegetation type—these include subalpine fir, blue spruce, some five-needled pines, and riparian forests. All together, these coniferous vegetation types cover about 53 percent of Ashley National Forest lands, with mixed conifer and Engelmann spruce comprising the largest amounts.

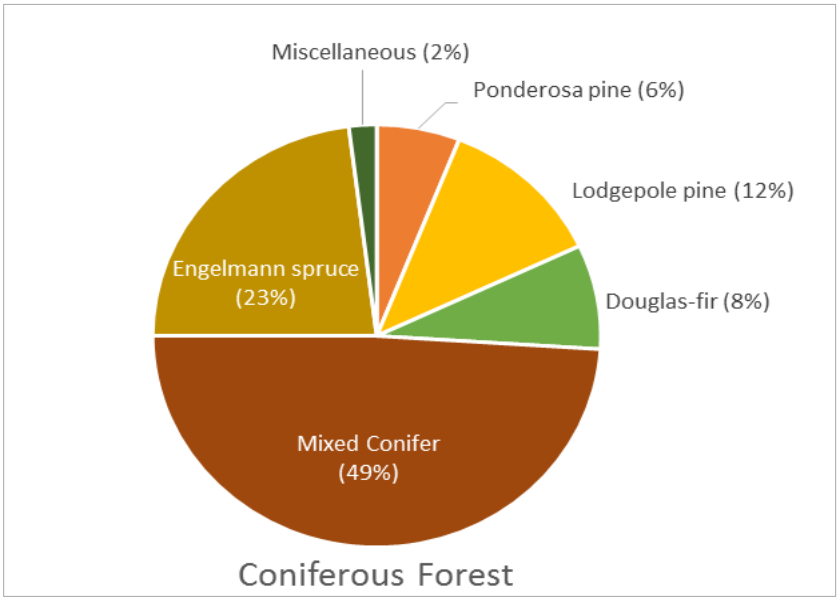


Figure 3. Percentages of coniferous forest vegetation types on the Ashley National Forest

Conifer forest ecosystems are shaped by many things—the most obvious of which are things like soils, precipitation, elevation, climate, and amount of sunlight. Yet, other factors, such as fires, insects, disease, and human influences can affect characteristics such as the age, structure, and composition of forest stands.

The suppression of wildfires in the past century has affected some conifer forests that were naturally dependent on fire to maintain those ecosystems. Without fire, some forests become dense and crowded, and can become more susceptible to large-scale insect and disease outbreaks. As trees die in large numbers, there are fewer large old trees, and an overall loss of structural and species diversity in the stand.

On the Ashley National Forest, beetle outbreaks in the last two decades have impacted the larger tree sizes in lodgepole pine, ponderosa pine, and Douglas-fir. Now, spruce beetle is affecting large Engelmann spruce trees as well. This means that the forest structure is likely to shift from mature and older trees, to younger trees or even delayed regeneration. While large-diameter trees can still be found across the Ashley National Forest, the current

distribution of sizes indicates a trend toward smaller trees that are not the preferred host size for bark beetles.

Beetle outbreaks in conifer forests have increased in the past two decades, killing large old trees and adding forest fuels that can lead to large wildfires.

Fire suppression and fire exclusion has also allowed forest fuels to accumulate in unmanaged forested stands. Vegetation types such as Douglas-fir have had an increase in accumulated dead trees and branches with the absence of fire, increasing the risk of higher severity fires as the trees fall. Additionally within the lodgepole pine and mixed conifer species, a combination of insects and disease have contributed to creating higher amounts of fuels with greater potential for crown fires to occur. Under high fire danger weather conditions and low fuel moistures, approximately 35 percent of the total area supports the potential for crown fire activity.

The top photo shows Douglas-fir that lacked age and size diversity when Douglas-fir beetle overtook the area. The bottom photo shows a more resilient area on the Ashley that has younger tree patches as a result of past fire. Because of the diversity, more trees survived the same beetle outbreak.

Although timber harvest and prescribed burning can help thin overcrowded stands and provide some benefits that regular fires once did, not enough active management has occurred on the Ashley to keep up with needed forest restoration. We have not had opportunities to salvage wood products from widespread bark beetle infestations due to factors such as lack of infrastructure (such as roads) and fluctuating timber markets. At the same time, there are concerns that we are losing our old growth forests. Whether through

harvest or through natural disturbance such as fire, there is now the added complexity of climate change impacts, which can impact bark beetle outbreaks. The dead and dying trees, combined with increasing temperatures, are projected to create conditions conducive to wildfires that are larger and more severe.

These ecosystem changes are affecting many other resources and uses. A loss of vegetation diversity can affect wildlife habitat, especially those species dependent on old growth. Watershed health could be affected by severe wildfires that burn hot enough to remove soil-stabilizing vegetation. Forests impacted by wildfire or beetles could result in the loss of harvestable timber as well as safety issues for recreationists as dead trees fall, or effects to scenery when impacted by wildfires.

Pinyon-Juniper Forests

Pinyon-juniper forests consist primarily of Utah juniper and two-needle pinyon pine, but may also include Rocky Mountain juniper. Pinyon and juniper can be found on a variety of landtypes of the Ashley National Forest, as they are not as restricted as some vegetation types by the types of soils they grow in. Fire is a key ecological function influencing pinyon-juniper health and diversity. Although low intensity surface fires occurred where understory fuel conditions allowed, most of these areas had fire frequencies of more than 200 years with stand-replacement fires that consumed a majority of the vegetation.

In a study on the Ashley National Forest, a high diversity of understory plants was found when there was less than 20 percent canopy cover of pinyon-juniper trees. Beyond 40 percent crown cover of pinyon-juniper, the understory vegetation was greatly depleted. Other studies in the area indicate that fewer understory species leads to less resilience or ability of the native plant community to recover after a fire. Without an abundance of resilient perennial herbaceous species and sprouting shrubs, burned pinyon-juniper sites are vulnerable to the spread of invasive plant species such as cheatgrass. Without restoration efforts following fires, cheatgrass may increase in pinyon-juniper woodlands in the future, causing more frequent and possibly larger fires. Both pinyon pine and juniper are slow to recover from severe fires.

There is potential for large, stand-replacing crown fires in pinyon-juniper woodlands over the next 150 years, due to pinyon-juniper forests having larger trees with increasing crown cover. Under high temperature or extreme weather conditions, many thousands of acres of mature pinyon and juniper woodlands can now burn in a day. This prediction has been validated to some degree by recent large stand-replacing fires that have occurred in pinyon-juniper forests, like the Mustang fire of 2002. This recent increase in large fires in pinyon-juniper is also supported by Forest Service and Bureau of Land Management fire reports.

Primary concerns with pinyon-juniper forests are related to climate change and invasive species. There is likely to be a reduction in area dominated by pinyon-juniper due to increased drought and temperatures and in areas of large, severe fires where invasive plant species are a threat to native plant diversity.

Sagebrush Communities

Communities of sagebrush are common to the Uinta Mountains, Tavaputs Plateau, and high deserts of Wyoming. Sagebrush is found across the landscapes of the Ashley National Forest within a broad range of environments, successional states, and community types.

Mountain and Wyoming big sagebrush and black sagebrush account for about 95 percent of sagebrush found within the plan area.

Since the early 1900s, almost all mountain big sagebrush communities within the plan area have been impacted by human uses and management. Livestock grazing has occurred in various forms and intensities in sagebrush communities for over 100 years. Since the 1940s, thousands of acres of mountain big sagebrush have been plowed and seeded into introduced grasses, sprayed with herbicide, and treated with prescribed fire. Seeding and herbicide treatments occurred mostly during the 1950s and 1960s to enhance livestock forage. In plow and seed treatments, seeded grasses successfully established and sagebrush returned to pre-treatment levels within expected return intervals regardless of the herbaceous understory.

Plow and seeding treatment of mountain big sagebrush community in 1959 (left) and the results in 2004 (right)

Mountain big sagebrush communities at lower elevations, Wyoming big sagebrush communities, and black sagebrush communities are currently in satisfactory condition in regards to plant species composition, species richness, shrub cover, and total ground cover; but these communities are at risk of competition with invasive plants. Long-term monitoring shows that cheatgrass is present and increasing in lower elevation sagebrush communities that have native herbaceous understories, especially following fire and severe drought.

In contrast, communities where seeded nonnative grasses dominate, cheatgrass is absent or has minor presence with no indication of spread or increase. Historical seeding treatments of these shrublands with nonnative grasses have helped cultivate a high resilience to invasive plants.

Existing conditions and current trends indicate that sagebrush communities above 8,000 feet in elevation are near or within their natural range of variation and are expected to remain so in the coming decades or until long-term monitoring indicates otherwise. Sagebrush communities below 8,000 feet are more susceptible to drought, fire, and invasive annual plant species than those of higher elevations, which may lead to loss of forage for both domestic livestock and wildlife. Many sagebrush communities are susceptible to conifer encroachment and displacement; therefore, prescribed fire and lop-and-scatter treatments have been used to maintain these communities.

Desert Shrub Communities

Most desert shrub communities on the Ashley National Forest are located within cold desert environments along Flaming Gorge Reservoir in southwestern Wyoming. Summers are typically warm and winters consist of below freezing temperatures. Annual precipitation ranges between 6 to 12 inches annually, and generally comes during the winter as snow. Vegetation is dominated by cold desert shrubs of the Chenopod family, sagebrush, early-season grasses, and a few forbs adapted to semiarid environments. Desert shrub plants only grow when temperatures are favorable and soil moisture is present, which indicates weather as a primary driver in community dynamics

Up until the year 2002, most desert shrub communities were quite resilient to drought, grazing, and other disturbances. Since then, some desert shrub communities have become particularly susceptible to invasive annual plants, while others show signs of susceptibility. Long-term monitoring has documented the spread of invasive plants during and shortly following periods of severe drought. Notable recent droughts include the years 2002 and 2012 through 2014. Gardner saltbush communities are most vulnerable to invasive plants and were the first communities to be negatively affected.

Since 2002, some desert shrubs have not successfully recovered from drought events with the presence of invasive plants such as halogeton and cheatgrass. Halogeton's ability to alter soil chemistry has resulted in widespread die-off of Gardner saltbush, allowing halogeton to dominate the site. A warmer and drier climate associated with frequent droughts would accelerate the spread of invasive nonnative plants in desert shrub communities. Within the next 30 years, substantial change in vegetation composition of many desert shrub communities is predicted to occur because of the presence and spread of invasive annual plants.

The Effects of Wildland Fires

Wildland fire plays an important role in establishing vegetation characteristics such as species composition, stand structure, and as a disturbance pattern across landscapes. It can also affect or be affected by other disturbances such as insects, disease, invasive plants, grazing, and logging activities. Wildland fire can also change recreational use across landscapes as people look for more scenic places to recreate.

Low-intensity surface fire in lodgepole pine

Fire Management

Because vegetation provides the primary fuel for wildland fires, and fire greatly influences the successional processes of vegetation, it's only appropriate that a discussion of fire management occurs here. Fire management in the Forest Service has changed greatly in the last 20 years, as forest managers have recognized the important role fire plays in ecosystems. Thus, in 2001, the forest plan was amended to update management of fire across the Ashley National Forest, changing from a protection and suppression objective to

guidance that authorized fire to be used in many areas for a variety of resource objectives. This has become especially necessary as forest stands have accumulated unnatural levels of dead trees and branches over time and have grown dense and crowded.

Prescribed fire is now used frequently as a management tool to rejuvenate vegetation and reduce dead woody material and forest litter. Prescribed fire is authorized for use across the Ashley National Forest, with some exceptions in wilderness and research natural areas.

The area where national forest lands abut private lands, especially where there are structures or communities, is referred to as the "wildland-urban interface." In these areas, the Forest Service and other Federal agencies work with private land owners to reduce forest fuels that could spread across shared boundaries. Many communities that lie next to national forests have developed "community wildfire protection plans," which spell out objectives for partnerships with Federal land managers, and help communities apply for State and Federal funds to accomplish fuel reduction activities.

On the Ashley National Forest, there are approximately 125,471 acres within the wildland-urban interface that are rated as having a moderate to extreme risk of wildfire potential. Longer duration, large, and more severe wildfires could become more common if climate trends continue to favor warmer and drier conditions.

Conclusions and Future Considerations for Terrestrial Vegetation

Current forest plan direction does not address the changes that have occurred to terrestrial vegetation communities in the last 30 years. These include the following:

- Increases in nonnative species such as cheatgrass have reduced plant diversity in some plant communities and have the potential to alter the pinyon-juniper fire regime.
- Fire suppression has decreased the influence of fire to maintain structural diversity or heterogeneity in coniferous forests.
- Recent bark beetle attacks are affecting lodgepole pine, Douglas-fir, and Engelmann spruce. When the forest plan was written, there was a focus on lodgepole pine forests and a mountain pine beetle epidemic occurring that is no longer relevant.
- Newer policies such as the 2001 Roadless Rule, environmental regulations, and changing philosophies have changed the level of timber harvest that was projected in the 1986 forest plan.
- Increasing temperatures, drought, and fuel loads would continue to present management challenges if more trees are killed by insects and disease, and the risk of large, uncharacteristic fires increases.
- Decreases in mature and older trees would make achieving standards and guidelines for old growth in the current forest plan difficult.

Additional Information

Huber, Allen; Colette Webb, Chris Plunkett, and others. 2017. Ashley National Forest Assessment, Terrestrial Vegetation Ecosystems Report. Ashley National Forest Supervisor's Office, Vernal UT.
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Plant Species at Risk

There is only one species of plant on the Ashley National Forest that is federally listed as threatened—Ute ladies' tresses. This plant has been found in four locations on the Ashley National Forest along the Green River. Most occurrences are small, having fewer than 1,000 plants and occupying less than 50 acres.

Several native plant species have been identified as "species of conservation concern," which means that the best available science indicates substantial concern about the species' capability to persist over time in the plan area. These species were selected based on an evaluation discussed in the Species at Risk Technical Report. This report describes the rational for selection, current habitat conditions, ecological and human-caused stressors, and population trend and sustainability. Following is a list of plant species of conservation concern approved by the Regional Forester.

- handsome pussytoes
- Graham's columbine
- Ownbey's thistle
- Evert's wafer parsnip
- clustered lady's slipper
- Wasatch draba
- rockcress draba
- tundra draba
- Untermann's daisy
- compound kobresia
- Huber's pepperplant
- Goodrich's blazingstar
- Maybell locoweed
- alpine poppy
- stemless beardtongue
- desert phacelia
- silvery primrose

Tundra draba and stemless beardtongue, plant species of conservation concern

Additional Information

Huber, Allen, Dan Abeyta, and Bob Christensen. Ashley National Forest Assessment, Species at Risk Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Carbon Stocks

Closely related to vegetation is the resource of "carbon stocks." Carbon stocks are the amount of carbon stored in the world's land-based ecosystem—above ground in vegetation and dead plant materials, and below ground in organic materials within soils. While carbon is stored beneficially, it is also released as carbon dioxide—a key contributor to greenhouse gases, which are considered a major cause of global warming. Generally, the amount of

carbon stored within soils is three times the amount of carbon within atmospheric carbon dioxide and vegetation combined.

Ecosystems store and release carbon at the same time, with carbon being stored in plants and soils and released back to the atmosphere from respiration and decomposition processes. “Carbon sequestration” is the uptake and storage of carbon as carbon dioxide is removed from the atmosphere and converted into living biomass during photosynthesis. Carbon is also stored in dead plant materials, including woody debris and forest litter, which are broken down by microbes adding carbon into soils. Forested areas can store more carbon than nonforested areas, and meadows and healthy rangelands can store more carbon than arid shrublands and desert plant communities. The carbon flow process is illustrated on the next page.

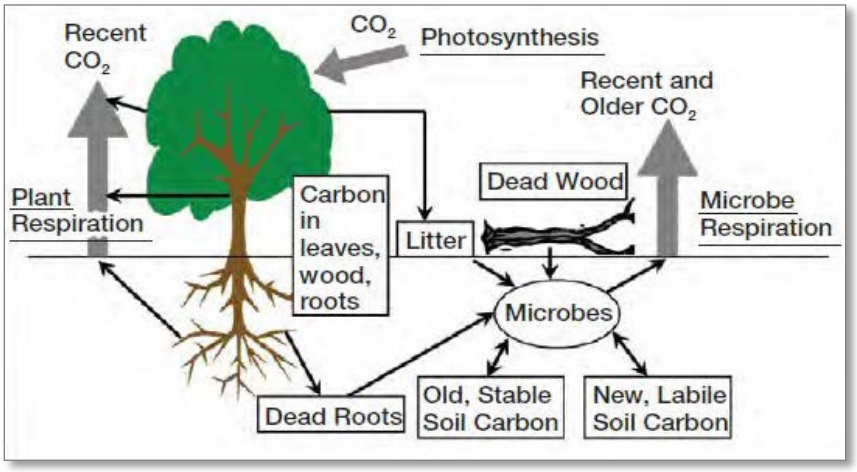


Figure 4. Flows of carbon from the atmosphere to the forest and back

An area is called a “carbon sink” if it accumulates more carbon in the soils and plants than the rate it releases carbon dioxide; conversely an area is a carbon source if it releases more carbon than the rate it is stored in plants and soils. Forests generally act as carbon “sinks” because the rate at which carbon is taken up and stored exceeds the rate at which carbon is released back to the atmosphere.

Forest carbon levels naturally change over time. For example, when they are in a rapid growth mode, forests may pull more carbon dioxide from the atmosphere than they release, which may help slow global warming. But when there’s a wildfire, the opposite can happen—forests can give off more carbon dioxide than they store in plants, organic matter, and soil, which may accelerate global warming. Studies of forest carbon stocks in the Intermountain Region of the Forest Service show that between 1950 and 2011, the national forests have been trending toward releasing more carbon than they hold.

Forest carbon stocks are influenced by disturbances and environmental factors. Environmental factors include the increase in carbon dioxide concentrations in the atmosphere, nitrogen deposition, the availability of key nutrients, and climate variability (such as precipitation level or temperature changes). Disturbances include fires, timber harvest, insect epidemics, diseases, and stand age. Middle-aged forest stands sequester the most carbon. Young forest stands take up less carbon from the atmosphere, and aging stands shift to higher rates of decomposition and carbon release. In recent years, environmental

factors of warming temperatures and droughts have also resulted in lower rates of tree growth and higher rates of decomposition.

Wildfires contribute to releasing carbon dioxide into the atmosphere

Insect epidemics reduced carbon storage in every forest of the Intermountain Region between 1990 and 2011, with a jump in disturbance levels beginning in 2005. Disturbance records summarized for the Ashley National Forest indicate the impacts to carbon stocks during this same time came from insect epidemics (87 percent), fires (10 percent), and timber harvest (3 percent). Forests within the Ashley National Forest have also lost carbon stocks to warming temperatures and droughts during the 1990 to 2011 period, and have shown overall decreases in carbon stocks.

Management practices that help reduce disturbances and retain carbon include maintaining the health of forest vegetation and the forest floor, and quickly regenerating stands after fire or timber harvest.

Forest carbon stocks include harvested wood products such as wood used for lumber, furniture, and all wood material (including bark) removed from the Ashley National Forest. This includes products that are in use or that have been discarded. Although wood products from the Ashley National forest are important, the products are estimated to make up only 0.82 percent of the total carbon stock in the Intermountain Region.

Carbon Stocks in Nonforested Areas

Rangelands in the Intermountain Region are generally carbon sinks, but can become carbon sources when influenced by climate or disturbances. The carbon stocks in soils are influenced strongly by climate and vegetation. Soils have the potential to sequester additional carbon if temperatures decrease and moisture increases. Conversely, soils may lose carbon stocks if temperatures warm without additional moisture or under drought conditions. Shifts in non-forested vegetation communities may impact the amount and depth where most soil carbon is stored. Rangelands degraded by overgrazing or taken over by invasive annuals like cheatgrass or saltlover (halogeton) slowly lose soil carbon, as well as their carbon stock within vegetation. Where degraded land areas are improved, more soil carbon may be stored.

Most soils in the Intermountain Region currently hold their maximum soil organic carbon for the existing climate. Generally, soils in hotter and drier areas contain a near surface soil organic carbon content (by mass) of 0.5 percent and in cooler and moister areas it's closer to 8 percent.

Additional Information

Leahy, Sarah. 2017. Ashley National Forest Assessment, Carbon Stocks Report. Ashley National Forest Supervisor's Office, Vernal UT.
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Terrestrial Wildlife Species and Habitats

The current planning rule emphasizes that forest plans provide for the diversity of plant and animal communities, and the persistence of native species in the plan area. This requirement is becoming more challenging because of changing factors. These factors include rising recreational use, demand for services and amenities, local land development, and a warming climate.

The Ashley's forest plan contains goals, objectives, and standards for wildlife and habitat, including some that are directed at individual species, groups of species, and habitat conditions. The forest plan emphasizes forage and cover needs on big game winter ranges, managing vegetation to maintain or improve habitat, providing for plant diversity and protecting special habitats. The plan's focus is to actively manage habitat while minimizing harm from other resource activities and to give special consideration to threatened, endangered, and high interest species. The plan also contains monitoring requirements.

A few of the management concerns related to wildlife habitat on the Ashley include:

- **Adjacent Private and Tribal Lands**: Nearby land development can reduce management options and result in conflicts related to wildlife.
- **Climate Change**: A warming climate can cause increased frequency or severity of droughts, fires, wind, floods, insects, and diseases. These disturbances can change habitat characteristics and force species to seek more suitable areas, which may or may not be available or accessible.
- **Habitat Fragmentation and Wildlife Corridors**: For various reasons, including human-caused land development, certain species are often stranded in isolated islands of suitable habitat. This can restrict genetic diversity, seasonal movement, and the ability of a species to move to a more suitable habitat area, which may cause declining populations.
- **Landscape Changes**: Wildfire, insect infestations, invasive plant species, historic fire suppression, and a warming climate are among the many factors that can make habitats unsuitable for the species that live there.
- **Management Coordination**: Wildlife are unaware of and frequently cross national forest boundaries. As a result, habitat and wildlife management efforts must often be coordinated with other land management agencies and private landowners.
- **Multiple Use**: Under the Federal Land Policy and Management Act of 1976, "multiple use" allows various recreational activities, commercial resource extraction, and other land uses. Because of this, multiple uses can change habitat or disturb wildlife.
- **Protected Area Locations**: Although approximately one-third of the Ashley National Forest is designated as having some level of protected status (such as wilderness or national recreation areas), many of these areas are at elevations that are not suitable for all species on the Ashley.
- **Species Interactions and Environmental Impact**: Changes in species populations and locations can affect other species and overall habitats. Examples include mountain pine beetles, predatory species, and "engineer" species such as beavers.
- **Wildfire**: In recent decades, wildfires in certain areas on the Ashley National Forest have been more severe, more frequent, or both. Following these large fires, vegetation that

had become decadent (dormant, stagnant) was replaced by new vegetation with much more variety—a condition that improves habitat for certain kinds of wildlife yet impacts others.

Habitat Conditions

Habitat conditions in the Flaming Gorge and Vernal areas can be characterized as generally in good to excellent condition. Distinctive to this geographical area located on the north slope of the Uinta Mountains is the largest ponderosa pine forested area on the Ashley National Forest. Lodgepole pine is a very common forest vegetation type on both the north and south slopes of the Uinta Mountains. Both forest vegetation types support a wide range of wildlife species. Mountain brush communities, such as mountain mahogany, are also found in this area. These communities provide an excellent habitat for many large and small terrestrial wildlife species.

Habitat conditions in the Duchesne-Roosevelt North and South units are similar to the rest of the Ashley National Forest. Ponderosa and lodgepole pine are common, as well as mixed conifer (Douglas fir and spruce). These conifer areas provide excellent habitat for various life stages of many wildlife species. The south unit supports a large area of pinyon-juniper mixed with sagebrush, and sage-grouse are abundant here. Overall, habitat conditions are in good to excellent condition in this area. On a forestwide scale, habitat conditions are good to excellent. Stressors such as large-scale beetle epidemics, climate change, drought, fire, wind events, invasive plants, and threats from human disturbances present challenges to management of some species.

The Utah Division of Wildlife Resources manages wildlife populations while the Forest Service manages their habitat. The agencies work together to provide benefits to the species and the public.

Species of Public Interest

These include species commonly enjoyed and used by the public for hunting, trapping, observing, or sustenance, including cultural or tribal uses. State fish and wildlife agencies manage many of these species through hunting regulations. See the “Wildlife Species of Interest” section on page 67 for more information.

Species at Risk

The Forest Service’s 2012 Planning Rule requires national forest planners to identify and evaluate vulnerable species in the plan area. Definitions of several at-risk species classifications include the following.

Endangered Species: These species are federally recognized as being at serious risk of extinction. Species under consideration for this designation are “proposed for listing as endangered.” Species on the waiting list to be proposed are called “candidate species.”

Threatened Species: These species are federally recognized as likely to become extinct in the foreseeable future throughout all or a significant part of their range. Species under consideration for this designation are also called “proposed for listing as threatened.”

Species of Conservation Concern: The Forest Service designation of "species of conservation concern" applies to native species that are not included in Federal categories but have declining populations, habitat threats, restricted habitat range, or other factors of concern. The best available scientific information indicates substantial concern about these species' capability to persist over the long term in the plan area. Ashley National Forest staff have identified and the Regional Forester has approved species of conservation concern for the Ashley National Forest. The full assessment of these species of conservation concern is contained within the "Species at Risk Report," available on our forest planning website. A full list of wildlife species that were evaluated, but not identified as species of conservation concern by Ashley staff, is also included in this report.

Lists of at-risk species are kept by various State and Federal agencies. The U.S. Fish and Wildlife Service keeps lists of federally endangered, threatened, proposed, and candidate species, while State wildlife management agencies and Natural Heritage Programs track other vulnerable species.

Canada Lynx (Threatened Species)

Lynx prefer dense vegetation under trees and young stands of forested areas, primarily spruce-fir forests, where they can find their primary food source—snowshoe hare. Between 1916 and 1972, 10 lynx were reliably traced in the Uinta Mountains. Between February of 1999 and March of 2007, 22 lynx from an experimental release in Colorado were located at least once in Utah, with the primary area of use in the Uinta Mountains. The majority of use was on the Wasatch-Cache National Forest and to a somewhat lesser degree on the Ashley National Forest. All these individual lynx were transient and did not take up residency in the Uinta Mountains.

Canada lynx

Stressors and threats include climate change, catastrophic fire, beetle epidemics, fragmentation, and degradation of habitat through activities such as commercial timber harvest, road building, and snow compacting activities. A large portion of this species' habitat on the Ashley is remote and receives little human-related impacts. The beetle epidemic has decreased lynx habitat in some areas, but has increased it in other areas where stands are regenerating and providing down wood and denning habitat.

North American Wolverine (Proposed for Listing)

Wolverine do not depend on specific vegetation. Habitat is typically cold, high-elevation areas that maintain deep persistent snow late into the warm season. No credible historical records of wolverine exist on the Ashley National Forest. However, in spring of 2014 a wolverine was photographed on the North Slope of the Uinta Mountains on the Uinta-Wasatch-Cache National Forest.

In November of 2014, Utah Division of Wildlife Resources documented wolverine tracks on the Ashley National Forest near Dutch John. Annual winter track surveys as well as bait camera stations have not documented any evidence of regular wolverine occurrence on the Ashley.

North American wolverine

Stressors and threats include climate change (which may reduce the amount of persistent snow late in the spring), spruce beetle epidemics, timber harvest, and human expansion. This species' habitat on the Ashley is remote and receives little human-related impacts; therefore, it is likely to persist over time in the absence of ecological stressors such as climate change and beetle epidemics.

Black Rosy-finch (Species of Conservation Concern)

The black rosy-finch is a bird common to the higher elevations of mountains on the Ashley National Forest, particularly associated with the alpine, rock, and in close proximity to persistent snowfields. The bird typically nests above tree line. Black rosy-finches are among the least studied of the North American birds because of the inaccessibility of their alpine habitat and their nest sites, commonly in cliffs. On the Ashley National Forest, there have been 85 occurrences of this species in the past 20 years.

Black rosy-finch

Stressors and threats include climate change that may decrease the persistence of snowfields, and possible habitat degradation from mining and improper grazing. Habitat conditions on the Ashley are currently in satisfactory condition.

Fringed Myotis (Species of Conservation Concern)

Fringed myotis

This bat has the shortest ears of the long-eared myotis group. The fringed myotis gets its name from the distinct fringe of short, wire-like hairs found on the membrane between its hind legs. The fringed myotis is primarily found in desert shrublands, sagebrush-grassland, and woodland habitats consisting of Douglas-fir, oak, and pine trees.

The fringed myotis has been reported to use a wide variety of structures such as caves, mines, and buildings for roosting and raising their young. There are several caves on the Ashley National Forest providing roosting and cover, but there have only been 8 documented occurrences of the fringed myotis in the past 20 years on the Ashley.

The primary threat to this species is white-nosed syndrome. It is uncertain if or when white-nosed syndrome will spread to bat populations on the Ashley. Other threats include disturbance to cover and maternity roosts, and possible habitat degradation. However, white-nosed syndrome is likely to be the primary factor affecting this species persistence over time on the Ashley. Habitats for this bat on the Ashley are likely to remain sustainable.

Greater Sage-grouse (Species of Conservation Concern)

This is the largest grouse in North America and it has declined throughout much of its range due to many reasons, including habitat loss. The greater sage-grouse was recently considered for a Federal listing under the Endangered Species Act but was not listed because the main threats to the species have been addressed by State and Federal agencies and private landowners. Although there are many locations of greater sage-grouse on the Ashley National Forest, they occur at relatively low numbers on the Ashley when compared to other areas of their range.

Sage-grouse habitats on the Ashley only support about 10 percent of the sage-grouse population in the Uinta Basin. Sage-grouse are found on Anthro Mountain in the Duchesne-Roosevelt Ranger District, as well as in scattered areas of the Flaming Gorge-Vernal Ranger District. Management concerns related to this species include habitat impacts from invasive plant species, climate change, oil and gas development, predation, and livestock grazing.

Greater sage-grouse

Typical of other wildlife species, the sage-grouse populations on the Ashley are cyclical. Threats to this species are likely to decrease and habitats are likely to improve on the Ashley under the 2015 Greater Sage-Grouse Forest Plan Amendment that is now being followed.

Peregrine Falcon (Species of Conservation Concern)

The peregrine falcon's preferred habitat is associated with wetlands, desert, shrublands, tundra, urban settings, forests, and woodlands. The abundance of cliff habitat associated with wetlands found along Flaming Gorge Reservoir, and Ashley and Brush Creek gorges provides plenty of suitable habitat for this species. Peregrines feed primarily on birds but occasionally will feed on small mammals.

Peregrine falcon

There are numerous sightings of this species on the Ashley National Forest. In general, habitat for peregrine falcons is in good condition. Stressors and threats to this species include climate change (which may reduce the amount of wetlands) and disturbance to nesting birds. There are very few threats on the Ashley to cliff areas. The abundance of cliff habitat found along Flaming Gorge Reservoir, and Ashley and Brush Creek gorges provides plenty of suitable habitat for this species.

Pygmy Rabbit (Species of Conservation Concern)

The pygmy rabbit is a North American rabbit, and is one of only two rabbit species in America to dig its own burrow. Pygmy rabbits are typically found in areas of tall, dense sagebrush cover, which they are highly dependent on to provide both food and shelter throughout the year. The pygmy rabbit's diet in the winter consists of up to 99 percent sagebrush.

Pygmy Rabbit

On the Ashley National Forest, there have only been nine documented occurrences of pygmy rabbit, all occurring in the Flaming Gorge National Recreation Area. Their habitat can be affected by warmer temperatures from climate change, affecting sagebrush communities over time, and nonnative invasive plants that have invaded sagebrush communities. Habitat can also be affected by grazing and energy development.

Rocky Mountain Bighorn Sheep (Species of Conservation Concern)

The Rocky Mountain Bighorn Sheep is the largest wild sheep inhabiting North America. These sheep inhabit some of the most inaccessible areas on the Ashley. Bighorns that reside on the Ashley are primarily in Utah but some bighorns from the Uintas may wander into Wyoming. Bighorns prefer high elevation open habitat types with adjacent steep rocky areas for escape and safety.

Rocky Mountain Bighorn Sheep

A large ram may weigh more than 300 pounds and stand over 42 inches tall at the shoulder. Ewes typically weigh 125 to 150 pounds. Similar to moose, Rocky Mountain bighorns are hunted on the Ashley National Forest, but just a few permits are issued each year.

Some threats to bighorn sheep include disease, predation (mountain lion), and habitat disturbances. The bighorn sheep population on the Ashley fluctuates; however, it is in a recent decline.

Conclusions and Future Considerations for Terrestrial Wildlife

Generally, current habitat conditions for wildlife on the Ashley National Forest are suitable for all or most life history needs. Some species migrate or have seasonal movements off the Ashley National Forest to adapt to seasonal changes, but other species spend their entire life on the Ashley National Forest. Conifer tree encroachment continues to threaten sagebrush and grassland communities. However, habitat improvement projects in these areas are helping offset this invasion. Even with large-scale beetle epidemics, drought, fire, wind events, invasive plants, and other stressors, habitat is currently supporting a diversity of

species on the Ashley National Forest. But the presence of these stressors do present some challenges to the management of species of conservation concern.

Species present on the Ashley National Forest today are essentially the same species prior to European settlement. Some species have declined in numbers while others have remained stable or increased. Overall, our knowledge base of species distribution and numbers on the Ashley National Forest has expanded, due to an increased focus on species inventory, monitoring, and management from both the State wildlife management agencies and the Forest Service.

In summary, the findings of this assessment suggest that the current forest plan is generally adequate to sustain suitable habitat to support the species discussed. However, we expect that there will be continued challenges in future management of these species on the Ashley National Forest, particularly those species of conservation concern. This is because of predicted changes in climate, combined with threats of invasive species, and challenges with managing wildlife and public interactions on the Ashley National Forest.

Additional Information

Abeyta, Dan and Bob Christensen. 2017. Ashley National Forest Assessment, Species at Risk Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Assessing Social, Cultural, and Economic Sustainability

What does it mean to evaluate social, cultural, and economic sustainability? Every national forest provides a diversity of benefits, uses, and services to its visitors and the communities and counties nearby. People derive all sorts of things from national forests—products, experiences, jobs, history, water, traditions, food, recreation services—the list goes on.

This section focuses on the kinds of benefits, uses, and services the Ashley National Forest provides to people within the national forest boundaries as well as to the lands and communities outside.

Cultural and Historic Resources and Uses

The cultural and historic resources of the Ashley National Forest are important to understanding the social, cultural, and economic influence the national forest has had on the surrounding area. Historic sites, archaeological artifacts, and lands that are sacred to local Indian Tribes provide communities and cultures with a strong connection to these national forest lands. Cultural and historic resources tell stories about conditions and changes through time, which can be helpful to national forest land managers as they contemplate the future sustainability of the plan area to provide a multitude of uses, ecosystem benefits, and human experiences.

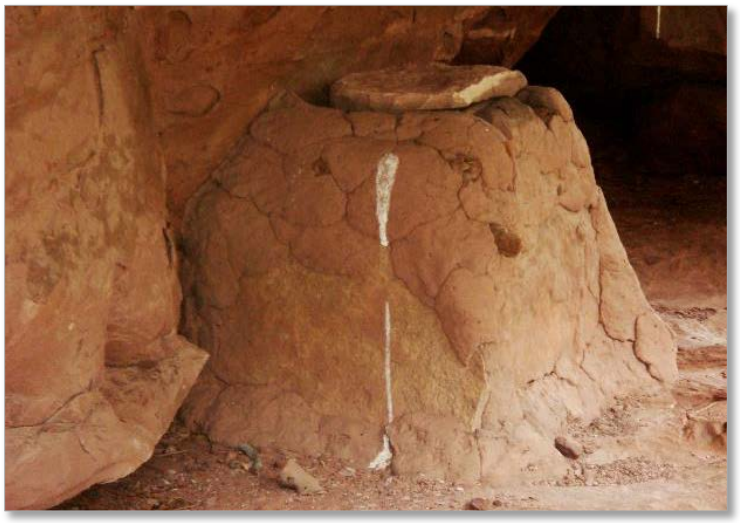
The First People

The earliest known people to occupy the area within the boundaries of the Ashley National Forest are evident in the variety of artifacts and places that have been found on the national forest dating between 10,000 BC and AD 1800.

Archaic People (Hunters and Gatherers). For more than 6,000 years (between 6500 BC to AD 100), native peoples lived in temporary seasonal camps as they hunted large game with atlatls (spear throwers), trapped small animals with snares, and gathered plant resources (such as seeds, roots, and berries). Temporary camps with brush shelters and stone-lined fire pits served as their homes.

Fremont People (Farmers, Hunters, and Gatherers). Around AD 100, the bow and arrow was introduced into the region and soon replaced the atlatl as the preferred hunting tool. Around AD 250, the introduction of domesticated crops (corn, beans, and squash) began an agricultural period (called the Fremont Period by archaeologists). As groups of native people began to farm, their whole subsistence strategy changed. Tending crops, irrigating fields, maintaining simple ditches, and storing food for the winter changed their lifestyle. Temporary seasonal camps gave way to more permanent houses that soon grew into hamlets. With a more sedentary lifestyle, people could produce items that were not conducive to a mobile lifestyle, such as thin-walled grayware ceramic vessels, clay figurines, and rock art. Evidence of the Fremont People are documented by the evidence they left behind. Baskets, projectile points, storage facilities, rock art, and ceramics are just a few examples of the many cultural artifacts that help tell the stories of how these people lived and survived.

Late Prehistoric People (Hunters and Gatherers). Around AD 1300, farming was discontinued in the region and the people returned to a strategy of hunting and gathering and living in temporary seasonal camps. The people during the late prehistoric continued to use the bow and arrow and made very rudimentary ceramic vessels for cooking. The people of the Late Prehistoric Period (AD 1300 to 1600) are most likely the closest ancestors of the Ute and Shoshone Indian Tribes[5] that inhabit the areas around the Ashley National Forest today.



Example of an ancient grain storage structure on the Ashley National Forest

The Euro-American Settling of the West

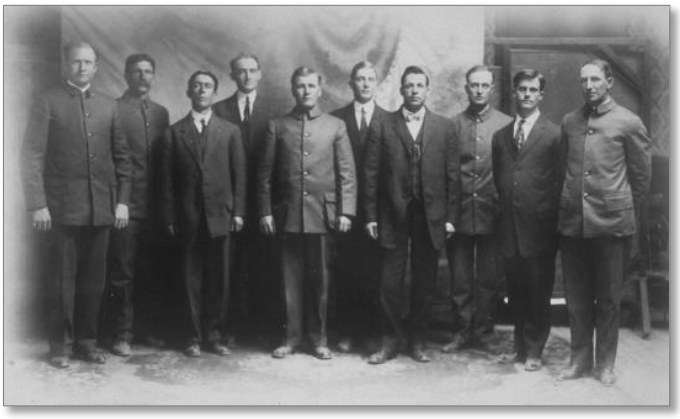
European Immigration. When the first Euro-American explorers, miners, and fur trappers arrived in the 1700s and 1800s, they significantly changed the lives of the indigenous people as the cultures interacted. By the mid-1800s, the spread of these new settlers throughout the area sparked land conflicts with the Native Americans, prompting the U.S. Government to force various Tribes from Wyoming, Colorado, and Utah to move to reservations. One of these is the Uinta and Ouray Indian Reservation, which abuts some of the Ashley National Forest boundaries today. As part of the Ute Indian Tribe's original homeland, the lands within the Ashley National Forest provide subsistence uses, as well as deep cultural connections and significance for local Tribal people.

The settling and expansion of Euro-American people across the West produced artifacts and historical significance for the people in local communities whose ancestors were settlers in the past 150 years or so. Explorers and trappers are responsible for many place names in the region, which they assigned as they travelled and traversed the many rivers and mountain ranges. Historic sites and artifacts from this period include cabins, ditches and pipelines, old sawmills and timber camps, mines, old roads and trails, fences, recreation facilities, and other items.

[5] Original reservation boundaries of the Eastern Shoshone are in west central Wyoming and do not include lands managed the Ashley National Forest.

Establishment of the Ashley National Forest

In 1897, the Uinta Forest Reserve was created, leading the way for the eventual creation of the Ashley National Forest in 1908. In the following decades, land adjustments with neighboring national forests led to the primary shape of the Ashley National Forest as it exists today. The national forest has provided a variety of uses and ecosystem benefits since it was established, as summarized in the following section.



Photograph of the Ashley National Forest staff in 1910

Historic National Forest Uses

Traditional Subsistence and Ceremonial Uses. As described above, the Ute and Shoshone people and their ancestors have been subsisting from the lands in and around the Ashley National Forest for thousands of years. See the section called “Areas and Resources of Tribal Importance” on page 50 for more information.

Grazing. Grazing on the Uinta Mountains and within the Uinta Basin was the impetus for bringing the first Euro-American settlers to the area. Settlers brought cattle and sheep to the area in the mid-1800s, which became one of the primary industries. Many thousands of livestock were grazed in unsettled areas, some of which eventually became national forests. By the early 1900s, forest rangers became concerned about overgrazing, especially as they noted degradation of the range and damage to watersheds. Overgrazing of lands across the west at the turn of the 20th century was the catalyst for the Forest Service to begin regulating grazing on the National Forests. In 1905, Forest Supervisor William Anderson established some of the first grazing allotments to begin managing grazing more sustainably in the national forest.

Ranching is still a primary livelihood in the counties that surround the Ashley National Forest. Ranching families maintain deep connections to the lands in and around the national forest, and strongly value use of the land as part of their heritage.

Irrigation and Water Storage. Euro-American settlers recognized the need to capture water coming out of the Uinta Mountains in the spring if they were to have water for crops and animals in the dry late summer months of the year. Many dams were constructed in the early 1900s creating lakes and reservoirs, and Franklin Roosevelt’s New Deal provided funds and labor for more. In 1956, the Central Utah Project was started as part of the Colorado River Storage Project Act, which allowed transport of water from streams on the south slope of the Uinta Mountains to the Bonneville Basin. The Flaming Gorge Dam and reservoir were also established around this time, becoming a prominent scenic landmark and recreation area of the Ashley National Forest.

Logging and Timber Production. Logging of forests on lands that eventually became the Ashley National Forest started in the mid- to late-1800s as small temporary sawmills were

established in the Uinta Mountains. In the first decades of the 1900s, timber production increased substantially. By the 1930s, permanent mills were established in towns like Hanna, Tabiona, Vernal, and Lapoint. The Ashley continued to provide a moderate supply of timber in the coming decades, peaking at 27 million board feet in the late 1980s before dropping continuously for the next 30 years. Remnants of past logging camps and roads on the Ashley still document the history of past timber production.

Mining. The Uinta Basin is rich with minerals and is the world's only source of commercial quantities of minerals called asphaltites (also known as gilsonite). Early Utah residents used limestone in the surrounding topography to help build their homes and communities; evidence of limekilns and limestone mining has been found on the Ashley National Forest, as well as on Bureau of Land Management land surrounding the Vernal and Roosevelt areas. Copper mining occurred in one of the largest mining operations in the eastern Uinta Mountains in the late 1800s and early 1900s. Phosphate also became an important resource in the 20th century, culminating in development of a concentrating plant in the 1960s that employed 200 people.

Oil and Gas Development. Although the first oil well was drilled in the Uinta Basin in 1900, very little activity occurred until World War II when production skyrocketed. Boom and bust cycles in the coming decades were influenced by changes in drilling and extraction technologies, as well as markets. A 1997 Forest Service decision on the Ashley and Uinta National Forests for oil and gas leasing in the Uinta Basin allowed exploration, development, and production of oil and gas fields on both national forests. Between 2009 and 2014 in the Duchesne-Roosevelt South Unit, the Berry Petroleum Company drilled more than 100 wells and constructed roads and well pads across their lease areas. A significant worldwide drop in oil prices in 2014 brought drilling of new oil and gas wells on the Ashley National Forest to an abrupt halt. Production of oil and gas continues from existing wells, but future drilling or development of oil and gas on the Ashley National Forest would depend on future oil prices and other factors.

Facilities Constructed by the Civilian Conservation Corps. Many Forest Service facilities, roads, and trails were constructed as part of work programs started during the New Deal in the 1930s, by Civilian Conservation Corps (CCC) workers and men provided jobs through other Government relief agencies following the depression. The CCC had the largest impact on the Ashley National Forest, which housed two of Utah's first CCC camps, as well as later ones. The men from these camps were responsible for building many services and amenities on the Ashley National Forest including:

- Ute Mountain fire lookout tower and weather station
- several ranger station buildings
- roads
- telephone lines
- drift fences
- stock driveways
- bridges
- pasture fences
- campgrounds
- stock ponds
- spring developments
- campground water developments
- timber stand improvements

Recreation. Recreation on the Ashley National Forest started developing around the 1920s as automobiles began providing people with more opportunities to explore and recreate. The CCC were instrumental in providing labor and new recreation facilities after the Depression. Commercial mountain resorts developed in the Uinta Mountains in the 1920s and 1930s, after the CCC built many of the roads that provided access to scenic areas. Although

recreation activities and improvements slowed during World War II, a new surge of recreation following the war prompted further development of campgrounds and recreation areas. Establishment of the Flaming Gorge National Recreation Area in 1968 not only increased recreation in the Gorge, but it led to an increase in recreation on other parts of the Ashley National Forest, which prompted construction of new facilities and upgrades to others.

Current Conditions of Cultural and Historic Resources

Since the 1950s, when cultural resources were first documented, only 16 percent of the Ashley National Forest has been systematically surveyed for cultural resources. Ongoing surveys, which are completed as part of Federal cultural resource compliance requirements, have demonstrated that numerous cultural resources could be present in areas not yet surveyed.

Cultural sites are defined as discrete locations of human-modified or constructed artifacts, features, or structures that are more than 50 years old. Currently, there are more than 2,500 known cultural resource sites documented in the plan area, including both prehistoric and historic sites. Multiple types of cultural resources have been found within the plan area and demonstrate human use of the landscape for more than 12,000 years.

Traditional cultural properties are those areas of cultural significance identified by American Indian Tribes, and other groups such as Mormon communities. These properties include features such as mountains, hills, springs, collecting areas, burial grounds, and unique landscapes. National Register Bulletin 38 provides guidance for documenting and evaluation traditional cultural properties. The Ute Tribe has suggested that traditional plant collecting areas within the original boundary of the Uintah Indian Reservation could be considered traditional cultural properties; however, no specific plant collecting areas have been identified.

Sites Listed on the National Register of Historic Places

Listing on the National Register indicates a resource has significance in American history, architecture, archeology, engineering, or culture. The majority of cultural resources on the Ashley National Forest have been evaluated to determine if they are eligible to be listed on the National Register of Historic Places. A small percentage of cultural resources have not yet been evaluated.

Five sites on the Ashley National Forest are listed on the National Register of Historic Places. They include:

- **Carter Military Road** – Built by the U.S. Army in the late 1800s, this road was used to transport supplies from Fort Bridger in southwest Wyoming across the Uinta Mountains to Fort Thornburgh in northeast Utah. Of its 86 miles, 36 are within the Ashley National Forest.
- **Indian Canyon Ranger Station** – This station was built in 1914 as one of the first headquarters constructed on the Uinta National Forest. It represents early Forest Service management and is one of few remaining examples of a standard architectural plan issued by the Forest Service's Washington Office in 1908.

Ute Mountain Fire Lookout Tower

- **Stockmore Ranger Station** – This former ranger station used from 1914 to 1954 represents early Forest Service management and is one of few remaining examples of Forest Service construction and design before the New Deal era.
- **Swett Ranch Historic Homestead** – Constructed in 1909 and used by the Swett family until 1968, this ranch is now a historical interpretive site.
- **Ute Mountain Fire Lookout Tower** – Constructed by the Civilian Conservation Corps in 1937, this lookout was designated as a historic interpretive site in 2014.

The Condition of Cultural and Historic Resources

Cultural site conditions indicate the degree to which the integrity of a cultural site is being compromised. Factors that can degrade or affect site integrity include public use, Forest Service management activities, logging, and grazing. Table 1 shows a summary of site condition assessments as of July 2016 for 2,253 sites on the Ashley National Forest.

Table 1. Cultural site condition assessments as of July 2016

Condition	Condition Description	Number of Sites
No Data	No Condition assessment has been completed	798
Excellent	There are no ongoing impacts to cultural site integrity	181
Good	There are minor ongoing impacts to cultural site integrity	617
Fair	There are moderate ongoing impacts to cultural site integrity	420
Poor	There are major ongoing impacts to cultural site integrity	237

To effectively manage cultural or heritage resources on the Ashley National Forest, Forest Service policy directs the Heritage Program to designate significant cultural sites as “priority heritage assets” with the requirement to consistently monitor their condition over time.

As of July 2016, 64 cultural resources on the Ashley National Forest have been designated as priority heritage assets. A list of these that includes their condition and date of assessment is provided in the detailed Cultural and Historic Resources Report.

The 64 sites listed include:

- brush fences
- Civilian Conservation Corps camps
- corrals
- fire lookout towers
- granaries and storage facilities
- historic Forest Service buildings
- homesteads and cabins
- limekiln sites
- logging flumes
- petroglyphs and pictographs
- prehistoric sites and excavations
- roads
- rockshelters
- springs

Artifact Collections

The Ashley National Forest has more than 55 cubic feet of boxed artifacts and curated materials collected during various archaeological excavations on the national forest. These materials are housed in a Forest Service storage building and do not meet Federal curation standards. The Ashley National Forest also maintains artifact displays, files, and archives at the Forest Supervisor's office, where they are in a temperature-controlled and secure environment. There are artifact displays at the Red Canyon Visitor Center and at the Daggett County Courthouse. These displays do not meet Federal security standards for curation facilities, but provide broad outreach opportunities to visitors. Other limited collections are housed by Weber State University and the Utah Fieldhouse State Park, which maintain facilities that meet Federal curation standards.

Trends Related to Cultural and Historical Resources

The trends in cultural resource management, identification, documentation, monitoring, preservation, and stewardship are based on past practices and processes as well as Federal regulations, policy, standards, and guidelines. Trends can have both positive and negative aspects in regards to their effect on cultural resources.

Positive Trends

Technology has assisted in better data gathering, records management, and documentation of culture resources. Cultural resource locations and data can be mapped and monitored using spatial geographic information systems software; records and archives are being digitized; and digital photography helps document sites, features, and artifacts.

An increased public interest in historic sites and prehistoric sites has increased awareness and the need to protect and preserve these resources. Some of these sites include the Ute Mountain Lookout Tower, Swett Ranch, and Henry's Fork rock art.

Adaptive reuse of several historic guard stations for recreational cabin rentals has provided incentives and funds to maintain these historic structures.

Negative Trends and Risks

The most common negative trends include:

- Existing and illegal roads that affect cultural sites
- Unauthorized excavation, looting, and collection of archaeological artifacts and sites
- Vandalism of sensitive rock art and archaeological sites
- Firewood cutting in areas of sensitive cultural resources, such as Ute brush fences
- Dispersed motorized recreation in archaeologically sensitive areas
- Cumulative effects of projects encroaching upon and affecting cultural resources sites
- Wildfires and prescribed fires in archaeologically sensitive areas
- Lack of personnel and resources to complete surveys and meet cultural resource compliance requirements

Specific resource types that are at a higher risk of degradation than the majority of sites on the Ashley include:

- Fragile and delicate cultural resources such as prehistoric basketry, matting, and ceramics
- Artifacts deteriorating in storage areas that do not meet Federal curation standards
- Frequently visited and vandalized rock art sites and cave sites
- Cultural sites located within or adjacent to modern improvements such as reservoirs, campgrounds, range improvements, and powerlines
- Benign neglect of some historic Forest Service guard stations due to lack of maintenance funding

Conclusions and Future Considerations

Since the last forest plan was issued, processes and requirements for the management of cultural resources have changed with added regulations and policies. Since 1986, the number of known cultural resource sites has increased 700 percent (from 345 to over 2,500). Meanwhile, only 226,066 acres of the 1.38 million acres (16.6 percent) in the plan area have been systematically surveyed for cultural resources. Possibly thousands of cultural resource sites are yet to be documented. Due to lack of funding and personnel, the Heritage Program has been unable to keep up with the growing project load and meet Heritage Program standards.

The Ashley National Forest does not have an effective cultural resource-monitoring program to measure the condition of sensitive cultural resources. Most site-condition assessments are more than 5 years old. Others are more than 20 years old.

In 2011, the Forest Service Manual (section 2360) created a solid foundation for an efficient Heritage Program that protects historic properties and maximizes their benefits for the public and the agency. Referred to as the “Heritage Program Managed to Standard,” the program measures seven components of heritage management on an annual basis to determine if a heritage program is effective. The Ashley National Forest has not been able to meet all of the desired requirements for the program since it was implemented because of the need to work on other priority projects.

Connecting cultural resources with the public is a key component of the Heritage Program Plan. Methods to increase public awareness, stewardship, and engagement with the public include enhancing public education and outreach, creating more partnerships, engaging youth, recruiting more volunteers, and increasing tourism opportunities.

Additional Information

Rust, Jeffrey. 2017. Ashley National Forest Assessment, Cultural and Historic Resources Report. Ashley National Forest Supervisor’s Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Areas and Resources of Tribal Importance

Native American Tribes all over the U.S. identify with areas that are sacred to them, or have special connections to specific lands because of their cultural history. For the Ute and Eastern Shoshone Tribal bands, the Ashley National Forest provides some of these places.

The south slope of the Uinta Mountains and Uinta Basin are the ancestral homelands or seasonal hunting and gathering grounds for multiple Ute Tribal bands. The north slope of the Uinta Mountains are borderlands between traditional use areas of Ute Tribal bands and the Eastern Shoshone Tribal bands. The Green River Basin in Wyoming is the traditional use area of the Eastern Shoshone Tribal bands. These traditional use areas provide opportunities for hunting and gathering of plants, animals, and other resources necessary for food, clothing, shelter, tools, and ceremonial uses.

Ute Chief Ouray and his wife, Chepeta

The original boundary of the Uintah Valley Reservation, set aside for the Ute Tribe, includes much of the land currently managed by the Forest Service in the Duchesne-Roosevelt Ranger Districts. The Ute Tribe maintains specific treaty rights within this original treaty boundary, and it is an area of Tribal importance to them (see figure 5, next page). Original reservation boundaries of the Eastern Shoshone are in west central Wyoming and do not include lands managed by the Ashley National Forest.

Places of Importance

The Ute Tribe has identified many places on the Ashley National Forest that are important to them because of their cultural history or resource needs. These include:

- Areas of minerals collected for ceremonial use
- Areas with evidence of ancestral uses
- Former battle areas
- Ceremonial areas
- Hunting and gathering areas
- Burial sites
- Vision quest sites
- Tribal and animal travel routes

Culturally Significant National Forest Resources

The Forest Service is required by the 2008 Food, Conservation, and Energy Act to allow Tribal members to collect botanical and other special forest products for traditional and cultural purposes. National forest managers must also coordinate with Tribal governments to increase awareness of culturally significant plants, and consider potential impacts on culturally significant plants when planning and carrying out management activities. Plants are often used for medicinal, ceremonial, and subsistence purposes. Other national forest resources that have cultural significance include crystals, feathers, branches and poles, and game animals.

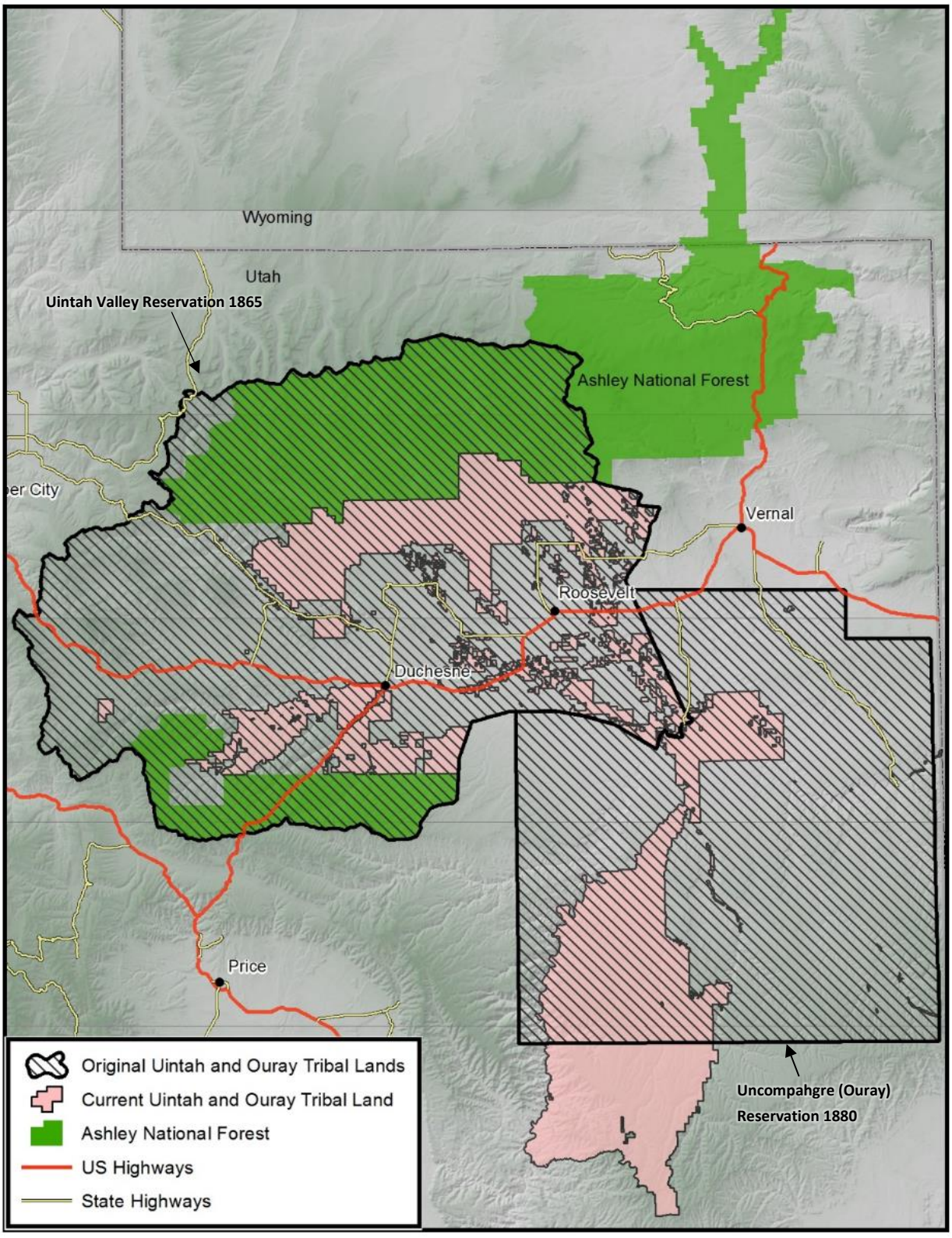


Figure 5. Historic and current Ute Tribal lands in the Uinta Basin

Current Conditions and Trends

The current forest plan for the Ashley National Forest does not provide any guidance on Tribal consultation or consideration of areas of Tribal importance when planning management activities. However, many laws, regulations, and directives specify Forest Service responsibilities when it comes to working with Tribes. Some of these include:

- **The 2012 Planning Rule:** Direction in the Rule requires consultation with federally recognized Indian Tribes and recognizes the Federal Government's unique legal relationship with the Tribes.
- **The Food, Conservation, and Energy Act of 2008:** Known as the Farm Bill, subtitle B, authorizes reburial of Tribal remains and cultural items found on national forest lands, and the authority to provide Tribes forest products for traditional cultural purposes.
- **The Tribal Forest Protection Act of 2004:** This law authorizes the consideration of tribally proposed projects on national forest to protect Indian trust resources from fire, disease or other threats that develop on national forest lands.
- **Executive Order 13007, 1996:** This executive order requires Federal land managers to accommodate access to and ceremonial use of Indian sacred sites, and requires avoiding adverse effects to those sites.
- **The Archaeological Resources Protection Act of 1979:** This law governs the excavation of archaeological sites on Federal and Indian lands in the United States, and the removal and disposition of archaeological collections from those sites.
- **The National Historic Preservation Act of 1966 and amendments:** This law directs agencies to consult with Tribes and consider traditional cultural properties when planning management activities.

To meet Federal laws, regulations, and Forest Service directives, the Ashley National Forest staff needs to consult with Native American Tribes to determine:

- Which traditional plants, animals, minerals, and other resources are of tribal interest
- The locations of traditional hunting, fishing, and gathering areas used by tribal members
- How Ashley National Forest projects, permits, and activities are affecting traditional uses of forest plant resources
- How the Ashley can protect sacred sites and traditional use areas
- What are current treaty rights and Federal obligations for Ute Tribe and Eastern Shoshone Tribe

Conclusions and Future Considerations

Because the 1986 forest plan did not provide any direction for areas of Tribal importance, these areas have not been incorporated into long-term forest planning and monitoring efforts for the past 31 years. Meanwhile, policies involving protection of Tribal areas and resources, and the manner in which we consult with Tribes have evolved considerably. This includes how we recognize and manage traditional and cultural landscapes. The legal framework of Federal policy, laws, and executive orders provides guidance and establishes a higher standard for Tribal consultation, authority to facilitate reburial of Native American remains and cultural items on National Forest System lands, and authority to manage how Tribes

collect forest products. This framework also requires we protect sensitive information that is considered private to the Tribes.

The Ute Tribe Cultural Rights and Protection Office has indicated the Ashley National Forest has not recognized Tribal treaty rights for access to traditional plants, minerals, and other resources. Tribal members have expressed concern that Tribal gathering of traditional plants and resources could be prohibited by Ashley National Forest employees and law enforcement. The Ute Tribe believes the Ashley National Forest has not formally recognized a difference between the general public use of Ashley National Forest products and tribal treaty rights, which allow tribal members to access and collect traditional plants and resources.

Ashley National Forest personnel have not consulted as extensively with the Eastern Shoshone Tribe due to fewer projects occurring within their traditional Tribal lands. Our staff has minimal information on their traditional cultural lands, history, Tribal rights, or current concerns. Consultation with the Eastern Shoshone Tribe is essential to understanding their areas of Tribal importance on the Ashley National Forest.

Additional Information

Rust, Jeffrey. 2017. Ashley National Forest Assessment, Tribal Uses Report. Ashley National Forest Supervisor's Office, Vernal UT.
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Recreation Opportunities and Scenery

The Ashley National Forest provides a wealth of recreation opportunities and scenic settings for local residents and visitors across the nation. The diverse topography, landscapes, water features, vegetation, fish, wildlife, and history make the Ashley a valued outdoor playground. Scenery is an important part of a visitor's recreational experiences, and it adds value to their national forest experience.

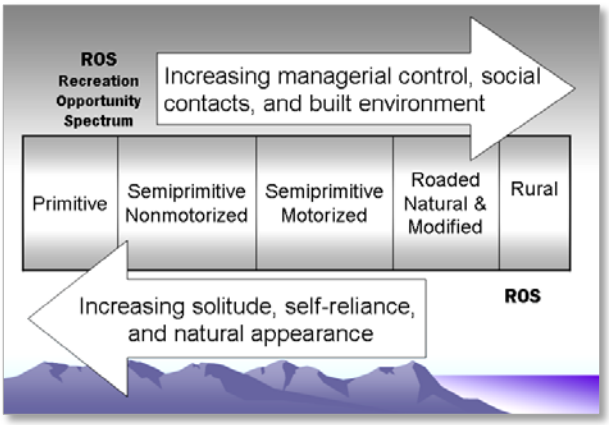
Through national visitor use monitoring and state surveys, we have been able to get a glimpse of who is visiting the Ashley National Forest and the kinds of recreational activities they participate in. Recreation activities listed by visitors include:

- backpacking
- boating and swimming
- camping
- driving for pleasure
- fishing and hunting
- gathering forest products
- hiking and walking
- horseback riding
- mountain biking
- nature center activities
- nature study
- nonmotorized activities
- off-highway vehicle riding
- picnicking
- relaxing
- river rafting
- rock and fossil hunting
- staying at resorts
- viewing and photographing landscapes
- visiting historical sites
- wildlife and bird watching
- winter sports

The scenic landscape of the Ashley provides a backdrop for the travel, work, play, and daily life for area residents and visitors. People can see the Ashley's landscape from many different viewpoints: travel routes, developed and dispersed recreation sites, backcountry areas, and nearby communities.

Evaluating Recreation and Scenery Resources

Recreation and scenery are evaluated and managed like other resources on the Ashley National Forest. Recreation is evaluated using different types of data including visitor numbers and ways people recreate. Much of this information is gathered using national visitor use monitoring surveys. We also use what is called the "recreation opportunity spectrum." This spectrum of five settings provides ways to classify how primitive or developed an area is, which correlates to the types of recreation that may occur there.



The recreation opportunity spectrum classes

The Forest Service uses the Scenery Management System to inventory, analyze, and monitor scenic resources. The primary components of the Scenery Management System are scenic character, scenic attractiveness, landscape visibility, existing scenic integrity, and scenic classes. The combination of these things gives an area its scenic identity and contributes to its sense of place. The system takes into account that natural disturbance

processes (like fire, insects, and disease) are part of a dynamic natural landscape and serve a role in maintaining healthy, sustainable, and scenic landscapes.

Current Recreation and Scenery Conditions and Trends

Recreation

In the Uinta Basin, the most popular recreation activities are sightseeing and driving for pleasure, picnicking, viewing wildlife, fishing, camping, visiting historical sites, hiking, hunting, and off-highway vehicle riding. National visitor use monitoring in 2012 identified viewing scenery as the top activity for visitors to the Ashley.

About 75 percent of Ashley National Forest visitors are locals—that is, they live within 200 miles of the national forest in Utah, Wyoming, and Colorado. The remaining 25 percent come from other areas of the nation, and very few are from other countries.

Recreation and demographic research at national and regional levels provide important information about current visitor recreation trends that could affect the Ashley now and into the future. These studies show that over the next 15 years, the population along the Wasatch Front and within the Uinta Basin is estimated to increase 25 percent. Smaller population increases are predicted for Uinta and Sweetwater Counties, Wyoming, and for the State of Wyoming for the same timeframe. An estimated 15 to 30 percent growth in visitation is predicted over the next 15 years on the Ashley National Forest, based on the predicted population increases and increases in nature-based recreation.

Since the forest plan was written in 1986, the nature and type of preferred recreation has evolved and changed. Fewer people use tents, while recreational vehicle use has increased.

Several well-known national parks are within reach of the Ashley National Forest, including Yellowstone, Grand Teton, Arches, Canyonlands, and Rocky Mountain National Park. In recent years, these parks have seen a record-breaking amount of visitors. The Ashley National Forest is likely to see some of these visitors while they travel because the Ashley is located on one of the primary travel routes between these parks.

Since the forest plan was written in 1986, the nature and type of preferred recreation has evolved and changed. For example, although the number of people camping has continued to increase; how they camp has changed—the percentage of people who camp in tents has decreased while those with self-contained recreational vehicles has increased.

Technology has also changed the way people recreate. Visitors can now find places to recreate with their smart phones, find an off-highway vehicle that is as comfortable to ride in as a car, and set up camp in recreational vehicles that include microwaves and big screen televisions. New recreational activities have emerged and grown, such as mountain biking, drone operations, geocaching, stand-up paddle boarding, and off-highway vehicle riding.

Scenery

The Ashley has a primarily natural-appearing landscape with high and very high scenic integrity. However, there are areas across the Ashley with low to moderate scenic integrity—areas that contrast in shape, form, and texture with the surrounding natural-appearing

landscape. These include past vegetation treatments, road corridors, infrastructure, human-caused wildland fires, and recreation facilities. Areas with low scenic integrity are being evaluated for potential improvement, particularly those areas likely to experience increased recreation use. With scenery viewing identified as a top activity for visitors to the Ashley National Forest, it will be important to maintain natural-appearing landscapes so visitor expectations can be met.

Designated and Special Areas

Flaming Gorge National Recreation Area

The Flaming Gorge National Recreation Area in northeastern Utah and southwestern Wyoming is an important amenity of the Ashley National Forest. At 207,363 acres, Flaming Gorge is most known for its scenery, geology, and recreation opportunities. The northern area is arid, and primarily treeless with cliffs, steep-sloped buttes, and beaches depending on the water level in the reservoir. The tall, narrow rock formations and caprock buttes in the Firehole area are a visual contrast to the sweeping panoramas of sagebrush flats and hills with rock outcrops in the northern and mid part of the area. The southern area has meadows, timber, steep canyons, and mountain peaks. The geological features of Sheep Creek and the visually dramatic Uinta Fault are popular scenic attractions.

The 91-mile-long Flaming Gorge Reservoir has the greatest development supporting water and road-based recreational opportunities on the Ashley National Forest. The shoreline has many large and small coves, inlets, and peninsulas, and small islands are dispersed throughout the reservoir. Visitors come from all over the nation to fish the reservoir and the Green River.

Antelope Flat Boat Ramp, Flaming Gorge National Recreation Area

The national recreation area also includes the Green River corridor below the Flaming Gorge Dam, Red Canyon, Firehole Canyon, Antelope Flat, Sheep Creek Bay, Hideout Canyon, Kingfisher Island, and many other unique areas and opportunities for motorized and non-motorized recreation.

Red Canyon looking northeast from south rim

Recreation activities include lake and river fishing, boating, sailing, water skiing, mountain biking, hiking, ice fishing, rafting, hunting, and driving scenic byways and backways. The steep, colorful cliff walls on both sides of Red Canyon are visible to boaters on the Flaming Gorge Reservoir and people viewing the reservoir and canyon from overlooks along the canyon rim and campgrounds along the shore. The scarp and dip ridges that surround and form Sheep Creek Bay, Kingfisher Island, Horseshoe Canyon, and Hideout Canyon create a distinctive visual and recreational experience.

The High Uintas Wilderness

Located in northeastern Utah, this wilderness area contains the wild core of the massive Uinta Mountains and provides a nearly pristine natural setting. At 453,900 acres, the High Uintas Wilderness is the largest wilderness area in the state of Utah, and more than three and half times larger than the second largest wilderness area in the state. The wilderness also extends into the Uinta Wasatch Cache National Forest to the west, although the Ashley National Forest is the lead manager of the High Uintas Wilderness.

The High Uintas Wilderness draws visitors from across the Nation. The recreational opportunities available are horse and foot trails to lakes and other natural features, fishing, hunting, viewing natural features and wildlife, and mountain and rock climbing. The size of the wilderness allows extended backpacking or horse packing trips not possible in other Utah wilderness areas.

The glacially carved Uinta Mountains crest rises more than 6,000 feet above the Wyoming and Uinta Basins. This rugged expanse of peaks and flat-topped mountains is the largest alpine area in the Intermountain West and is the setting for Kings Peak, the highest peak in Utah at 13,528 feet. Hundreds of picturesque lakes, streams, and meadows are nestled in beautiful basins. Cold, clear rivers plunge from the basins to deep canyons that form the headwaters of Utah's major rivers.

Grandaddy Basin in the High Uintas Wilderness provides a primitive setting and scenic vistas

The Uinta Mountains provide diverse habitats for plants and animals. Above tree line, alpine plant communities thrive in the harsh climate of the highest altitudes. Thick forests of Engelmann spruce, subalpine fir, and lodgepole pine trees blanket the land below tree line. These forests are broken up by park-like meadows and lush wetlands. In the lower elevations, aspen groves and countless mixed species offer contrast to the scene. The Uinta Mountains are home to elk, mule deer, moose, mountain goats, coyotes, black bears, bighorn sheep, ptarmigan, river otter, several species of raptor, pine marten, and cougar, to name a few.

The forested hills, steep canyons, and open meadows on the south slope of the Uinta Mountains add to dispersed recreation experiences on the Vernal Ranger District. The Dry Fork drainage is a popular location for recreation, in part due to its steep canyon walls and diverse vegetation. The south slope of the Uinta Mountains are the background for the towns and cities in the Uinta Basin. The forested hills, treeless mountaintops, and steep canyons visible from the basin are important factors in the quality of life for residents.

Sheep Creek Geological Area – Named after the Rocky Mountain bighorn sheep that inhabit the area, the Sheep Creek Geological Area is dominated by steep scenic cliffs and sections of folded and twisted rock that reveal millions of years of geological history. A portion of the Sheep Creek-Spirit Lake Scenic Backway bisects the 3,590-acre area.

Research Natural Areas – The Ashley National Forest contains seven research natural areas with a total area of 6230 acres. The research natural areas have been designated for the purposes of maintaining biological diversity, conducting non-manipulative research and monitoring, and fostering education.

National Recreation Trails – There are several national recreation trails on the Ashley National Forest:

- The Fish Creek National Recreation Trail allows horse and foot traffic. It follows a ridgeline above Fish Creek, between Moon Lake and Center Park Trailhead on the south slope of the Uinta Mountains.
- The Little Hole National Recreation Trail follows the Green River through the Ashley National Forest, from the Flaming Gorge Dam to the Little Hole Day Use Area. The trail is open to hiking and open seasonally to mountain biking, and it provides access to the Green River for fly-fishing.
- In the Flaming Gorge area, a portion of the Jedediah Smith Trappers Route 1824 follows the Green River and the Flaming Gorge Reservoir. This trail is managed by the National Park Service.

Scenic Byways and Backways – Scenic byways are federally designated roads that feature one or more archeological, cultural, historic, natural, recreational and scenic qualities. Scenic backways are State designated routes in Utah that are less-developed rugged routes, often on National Forest System roads. They include:

- Flaming Gorge-Uintas Scenic Byway
- Dinosaur Diamond Scenic Byway
- Indian Canyon Scenic Byway
- Sheep Creek-Spirit Lake Scenic Backway
- Red Cloud-Dry Fork Loop Scenic Backway
- Reservation Ridge Scenic Backway

Inventoried Roadless Areas

Inventoried roadless areas were established under the 2001 Roadless Area Conservation Rule (36 CFR Part 294). Approximately 57 percent of the Ashley National Forest land mass (790,485 acres) is located within 36 individual inventoried roadless areas.

The Roadless Area Conservation Final Rule prohibits road construction, reconstruction, and timber harvest, expect under certain circumstances, in inventoried roadless areas because they have the greatest likelihood of altering and fragmenting landscapes, resulting in loss of roadless area values. The roadless area values listed in the Roadless Area Conservation Final Rule are:

- High quality of undisturbed soil, water, and air
- Sources of public drinking water
- Diversity of plant and animal communities
- Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent of large, undisturbed areas of land
- Primitive, semi-primitive nonmotorized, and semi-primitive motorized classes of dispersed recreation
- Reference landscapes
- Natural appearing landscape with high scenic quality
- Traditional cultural properties and sacred sites
- Other locally identified unique characteristics

Other Special Areas and Sites

Other special areas that contribute to the variety of recreation opportunities on the Ashley include rivers deemed suitable to be federally designated as wild and scenic, geologic areas, caves, research natural areas, national recreation trails, historic sites and routes, and designated scenic driving routes. The physical, biological, and cultural images combine to give these areas their scenic identity and sense of place.

Upper Uinta River – The Upper Uinta River was found to be suitable as a "wild river" in the Wild and Scenic River Suitability Study for National Forest Lands in Utah completed in 2008. The river includes Gilbert Creek, Center Fork, and Painter Draw in the High Uintas Wilderness.

Green River – In 2008, the Green River from the Flaming Gorge Dam to the Ashley National Forest boundary was found to be suitable as a "scenic river" in the Wild and Scenic River Suitability Study for National Forest Lands in Utah. This segment of the Green River is a nationally recognized blue ribbon trout stream and is popular for both fly-fishing and floating.

Boats floating on the Green River below the Flaming Gorge Dam

Historic Sites – Historic sites on the Ashley National Forest include the Swett Ranch and Ute Tower. Swett Ranch is managed as an interpretive site in the Flaming Gorge National Recreation Area. Ute Tower is a fire lookout tower no longer in use that provides people the opportunity to see what living and working in the tower was like for fire lookouts.

Carter Military Road – This historic road led to developments and growth of communities in the Uinta Basin and Mountains. Completed in 1881, the road was built without surveys by Fort Bridger's Judge Carter as a supply route between military forts. The road is listed in the National Register of Historic Places.

Historic Guard Stations and Yurt Rentals – The Ashley National Forest has 11 former guard stations and yurts (a large circular tent with a wooden frame) available for public rental in both the summer and winter seasons. The facilities are often used for Boy Scout outings and family reunions.

Whiterocks Cave – This is one of few caves on the Ashley National Forest that contains impressive formations of water deposited minerals. Guided tours are sometimes offered in September to a few visitors. The area is otherwise closed to public access due to safety and vandalism concerns.

Paradise Guard Station

Developed Recreation Facilities

Recreation that occurs with the support of facilities is referred to as “developed recreation.” All developed sites on the Ashley National Forest, with the exception of boat-in campgrounds, are accessed by roads. The Flaming Gorge National Recreation area developed recreation program is one of the most highly developed in the National Forest System. The nature of the national recreation area, which contains the Flaming Gorge Reservoir, requires additional developed recreation facilities besides campgrounds and day use sites. Boating facilities that are necessary to access the Flaming Gorge Reservoir include boat ramps, restrooms, docks, and fish-cleaning stations. Some may also have floating restrooms and sewage pump-out stations. There are developed campgrounds ringing the Flaming Gorge Reservoir, many of which have potable water available. Numerous water systems, including three full water-treatment plants, are necessary to provide this potable water. Sewer lagoons and sewer lift stations are also present.

Facilities supporting developed recreation on the Ashley include:

55 campgrounds
27 interpretive and historic sites
16 boat ramps
11 trailheads
11 rental cabins, yurts, and buildings
11 group campgrounds
8 day-use areas
7 picnic areas
7 fishing access sites
4 resorts and lodges
3 swim beaches
3 marinas
2 visitor centers
1 target range
1 recreational vehicle park

Trends at Developed Sites

The current developed recreation activities, trends, and conditions on the Ashley National Forest vary by area and use type. Highly developed sites are receiving more use. Visitation numbers at lesser-developed sites remain similar to past numbers. The western half of the Duchesne-Roosevelt Ranger District is experiencing increased visitation in the North Fork Duchesne, Rock Creek, and Lake Fork Canyon Campgrounds. This increase is primarily from visitors from the Wasatch Front, who are looking for less crowded areas and available developed campsites.

The developed campgrounds and facilities on the Duchesne-Roosevelt North area are mostly located in the valley bottoms. The visible scenery in these valleys is a primary reason visitors choose to visit the sites. Many local visitors to the Ashley have been returning to the same locations for years for family outings and reunions. Visitors value the natural-appearing landscape as part of their family's traditional outing.

The facilities at the campgrounds and day use sites in the Flaming Gorge National Recreation Area were constructed in the 1960s and the early 1970s. These facilities were not designed for the size of current recreational vehicles, and modifications are necessary to accommodate these vehicles. Water systems and sewage facilities are aging as well and the maintenance needs are increasing considerably. Across the Ashley, some campground water systems have been temporarily or permanently closed because of deteriorating infrastructure and inability to bring the water facilities up to water quality standards.

Campground and day use facilities in the Flaming Gorge National Recreation area were constructed in the 1960s and 1970s. Water systems and sewage facilities are aging and maintenance needs are increasing.

Deferred maintenance on developed sites is an issue for the Ashley National Forest. While use and maintenance needs have increased, budgets have decreased. As the American public ages, yet remains active, there is an increased interest in, and need for, adequate accommodations for many forms of recreation activities and infrastructure. Developed sites that have been designed for universal accessibility will become increasingly important as the population ages.

Dispersed Recreation

Dispersed recreation is any recreation activity outside of a developed recreation site and includes travel on trails, roads, or water. Activities include camping, backpacking, off-highway vehicle use, driving for pleasure on roads and trails, fishing, boating, cross-country skiing, mountain biking, trail running, and horseback riding.

Dispersed recreation occurs across undeveloped areas of the Ashley National Forest. The level of dispersed use depends on visitor experience desired, setting, ease of access, and nearby facilities. The shoreline surrounding the Flaming Gorge Reservoir has a lot of dispersed camping use by visitors who desire water-based activities. The visitors often use both recreational vehicles and boats in areas such as Stateline Cove and South Buckboard.

The broad, gentle shoreline of Stateline Cove is a popular camping area adjacent to the reservoir; visitors will often anchor their boats on the beach. South Buckboard peninsula has a long flat shoreline with easy access to the reservoir.

The eastern portion of the Vernal Ranger District and western portion of the Flaming Gorge Ranger District have a lot of dispersed camping and off-highway vehicle use throughout the area. The area is most used by residents of northeastern Utah or southern Wyoming, who have a long tradition of using certain areas for annual gatherings of families and friends. Dry Fork Canyon on the Vernal Ranger District is the most easily accessed portion of the Ashley National Forest from Vernal, Utah. The area is enjoyed by equestrians, hikers, and mountain bikers, many of whom are residents from the eastern Uinta Basin area.

Dispersed camping at Stateline Cove on the Flaming Gorge Reservoir

On the Duchesne-Roosevelt Ranger District, dispersed camping use is concentrated in river and road corridors on the south slope of the Uinta Mountains.

The Green River corridor, below the Flaming Gorge Dam, receives very high amounts of dispersed use from fishing and rafting. Visitors come from across the nation to fish the blue ribbon trout fishery. The Green River's erosion of the Uinta Mountains resulted in steep, high, red-colored canyon walls rising from the reservoir and from the river below Flaming Gorge Dam.

Dispersed recreation in the High Uintas Wilderness is very popular. This use is primarily concentrated around the multiple lake basins scattered across the south slope of the Uinta Mountains. There are 291 miles of wilderness trails in the Ashley National Forest's portion of the High Uintas Wilderness, and there are no established campsites.

Winter dispersed recreation consists of nonmotorized activities (snowshoeing, cross-country skiing, and backcountry skiing) and motorized over-snow activities; primarily snowmobiling. A number of designated cross-country ski trails are closed to snowmobiles and other over-snow motorized travel. The Ashley National Forest has a cooperative agreement with Uintah and Daggett Counties to groom snowmobile trails on the Vernal and Flaming Gorge Ranger Districts. Winter recreation use in the Vernal Ranger District is high, in part because U.S. Highway 191 provides year-round access to the higher elevations.

Dispersed Recreation Trends

Motorized Vehicle Use – Since the forest plan was written in 1986, off-highway vehicle use has increased substantially on the Ashley National Forest. Changes to the technology and variety of off-highway vehicles available has influenced how and where people can drive off established roads. Vehicles can now drive to undeveloped areas across terrain and topography that used to be inaccessible. Unauthorized user-created routes have increased

on the landscape, causing resource damage along the way, often unbeknownst to the people driving the routes.

In 2009, we conducted a travel management process and examined motorized routes on the Ashley National Forest. The process eliminated cross-country travel for other than appropriate over-snow use and helped determine what roads and routes should be designated as motorized roads and trails. However, unauthorized routes on the Ashley are still a problem in areas like Taylor Mountain, Dry Gulch, McKee Draw, Iron Springs, and lands around the Flaming Gorge Reservoir. The popularity of side-by-side off highway vehicles was underestimated during the travel management analysis. Many visitors are moving away from four-wheel, single-rider, all-terrain vehicles to side-by-sides, which are safer and more comfortable. These vehicles are 60 inches wide or wider, and a number of the popular motorized trails on the Ashley National Forest are designated for 50-inch widths or less.

The use of recreational vehicles has also increased significantly, influencing use at dispersed sites. People can park their campers anywhere they can drive to and have a mobile, self-contained home. Some campers exceed the 16-day stay limit, which has led to conflicts with other users and concerns about effects to forest resources. Effects can include littering, human waste, trampling of vegetation, soil compaction and erosion, and wildlife disturbance.

Nonmotorized Use – Backpacking in the High Uintas Wilderness has become more popular in recent decades, while horse and mule use has declined. The numerous lake basins are popular destinations for wilderness visitors, due to their availability for fishing, scenery, and opportunities for solitude. Two popular trailheads into the High Uintas Wilderness are:

- the Henry Fork Trailhead on the Uinta Wasatch Cache National Forest, which provides access to Kings Peak on the Ashley National Forest, and
- the Grandview Trailhead, which provides easy access for groups and less experienced backpackers to the Grandaddy Basin.

At Grandaddy Basin, visitation is concentrated from June through August. High use levels in some areas are impacting soils and vegetation and affecting opportunities for solitude and other wilderness characteristics. Seasonal wilderness rangers have made the area a primary focus for public education and enforcement of wilderness use regulations.

Full parking lot at the Grandview Trailhead

Mountain biking is another activity that has evolved and grown across the Ashley National Forest since the 1980s. Popular areas include the south rim of the Red Canyon area, between Manila and Dutch John, Utah and the Wilkins Peak area, south of Green River, Wyoming (both are in the Flaming Gorge National Recreation Area) and the Dry Fork area on the Vernal Ranger District. Visitors and local governments are interested in adding additional trails, particularly in the Flaming Gorge National Recreation Area in Daggett County. Other nonmotorized dispersed recreation activities include rafting, camping, fishing, and sightseeing.

Outfitting and Guiding

Commercial outfitting and guiding activities on national forest lands are considered a "recreation special use." Such activities (like guided hunting and educational activities) are regulated through special use permits, which establish operating terms, numbers of days, and areas where outfitters and guides can operate. The 1986 forest plan includes no direction for outfitters and guides. Meanwhile, the demand for these services has increased over the years in the High Uintas Wilderness and the Flaming Gorge Reservoir. Although some outfitter and guide policies for the Ashley were established in the 1990s, outfitter and guide activities have changed or evolved during the past 20 years. The trends of these activities need to be evaluated and compared with current policies to determine the risks and benefits of outfitter and guide operations to national forest resources and services.

Interpretation and Education

With its vast amount of recreation opportunities and historic sites, the Ashley National Forest has great potential to increase its interpretation and education opportunities. Although the Ashley does not have a formal interpretation and education plan, there are many programs and facilities provided to visitors, and Ashley staff present education programs at various areas around the national forest.

The Flaming Gorge Ranger District has the most active interpretive program on the Ashley. The interpretation focal point of the district is the Red Canyon Visitor Center. In 2016, 23,446 people visited the center from May to September—the highest number since visitation began being recorded in 2000. Other notable locations include the Ute Tower Fire Lookout and the Swett Ranch historic homestead. Interpretive programs are also conducted at day-use areas, amphitheaters, and campgrounds; lodges and resorts; schools, fairs, and parades; and State parks, private lands, and other agency facilities.

Influences of Recreation on Ecological and Economic Conditions

The health and resiliency of the Ashley's natural resources are critical to the sustained delivery of natural recreational settings and opportunities. After all, visitors come to national forests to get out in nature; spend time in pristine or natural settings; and enjoy clean air, water, and wildlife. Concentrated use in popular areas of any national forest can result in damage to the site. Some recreation activities inadvertently cause ecological damage, and if left unchecked, they can be difficult to manage. Negative effects of recreation on the environment can include:

- Introducing invasive plants
- Disrupting wildlife during stressful periods
- Delivering sediment to streams and rivers from motorized trails
- Decreasing water quality from human waste or other pollutants

Although areas of concentrated use are found in the eastern Uintas, much of the area's settings are relatively intact, providing clean air and water, diverse wildlife populations, and pristine alpine areas.

From an economic standpoint, recreation on the Ashley National Forest contributes to economic sustainability in northeastern Utah and southwestern Wyoming. Hiking, fishing, and hunting are the top activities for visitors to the Ashley. Visitors spend money in local communities on groceries, gas, supplies, rental equipment, and overnight accommodations.

Outfitters and guides contribute to the economy and events hosted on the Ashley National Forest contribute indirectly as well. See the "Social and Economic Conditions" section for more information.

Conclusions and Future Considerations

The recreational opportunities and scenic vistas on the Ashley National Forest are highly diverse and some of the Ashley's greatest assets. Visitor activities are specific to certain settings and recreation facilities, from water skiing on the Flaming Gorge to horse packing through the High Uintas Wilderness. Facilities constructed in the 1970s and 1980s are no longer meeting visitor's needs, especially as public expectations for amenities and services have changed. Declining recreation budgets have led to financial constraints, and the cost of maintaining aging facilities is making achievement of current forest plan desired conditions challenging. This is especially true for water systems and water treatment plants, because of the need for certified, full-time water treatment plant operators and required maintenance. Although dispersed recreation takes place outside developed sites, many users depend on developed sites, such as boat ramps and trailheads, to access dispersed recreation opportunities.

Dispersed recreation opportunities vary across the Ashley National Forest and competition for use of available land is increasing between motorized, nonmotorized, and bicycle recreational users. Dispersed camping has increased significantly in the past 30 years on the Ashley National Forest. The 1986 Ashley forest plan objectives, standards, and guidelines for dispersed recreation are very general and do not reflect the current demand for dispersed camping. Motorized dispersed recreation is popular across the Ashley National Forest. Poorly located trails and unauthorized trails are causing resource damage and conflicts between motorized and non-motorized users and other resources such as grazing. The 1986 forest plan objectives, standards, and guidelines for trails are not possible to achieve with current funding and staffing levels. State trail grants have been used in past years to repair or reroute poorly located and deteriorating trail sections, but much more is required to bring both motorized and non-motorized trails to Forest Service standards. Partnerships will be important in maintaining Ashley National Forest recreation facilities and trails.

Recreational visitation and use is expected to increase by 15 to 30 percent over the next 15 years. The Ashley National Forest does not have a forestwide interpretation and education plan, or an education plan for the High Uintas Wilderness. There is also no forest plan direction for outfitting and guiding, which is important as visitor use continues to increase. Accessible developed sites, more amenities, and local area interpretation will be in demand as the population grows older, yet remains active. It will be necessary for the Ashley National Forest to identify levels of sustainable recreation settings and opportunities to meet these demands with decreasing funding and staffing levels.

Scenic resources on the Ashley have also changed since the plan was written and they could be affected by the following in the future:

- climate change causing a shift in vegetation types, more uncharacteristic wildfires, and insect epidemics
- changes in seasonal reservoir and lake levels
- future oil and gas development which includes access roads, oil well pads, and pipelines
- large infrastructure projects, such as transmission lines and pipelines

- vegetation treatments and timber harvests
- development of private inholdings in the Ashley
- increasing recreational use in dispersed areas

Visitors identified viewing scenery as a top activity performed on their visit to the Ashley National Forest. With recreation use on the Ashley expected to increase, it will be important to maintain natural-appearing landscapes to meet visitor's expectations.

Additional Information

Buerkle, Ryan. 2017. Ashley National Forest Assessment, Scenery Report. Ashley National Forest Supervisor's Office, Vernal UT.

Buerkle, Ryan. 2017. Ashley National Forest Assessment, Recreation Opportunities, Settings, and Access Report. Ashley National Forest Supervisor's Office, Vernal UT.

Both reports are available on the Ashley National Forest planning website at:
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Wildlife Species of Interest

Wildlife and habitat on the Ashley National Forest have many social, economic, recreational, spiritual and scientific benefits to people. Wildlife hunting, and to a lesser degree trapping, have a strong tradition in western culture and are a major economic driver in western states. Viewing and photography of wildlife also contribute greatly to local economies. Thousands of people travel to this region every year to visit the area. While some come to Dinosaur National Monument or to white water raft on the Green River, many extend their visit to experience the Ashley National Forest. These visitors come for a variety of reasons, but the chance to see wildlife is generally on the list. These resources attract the attention of wildlife observers, professionals, and advocates nationwide.

Species of interest are those commonly enjoyed and used by the public for hunting, trapping, observing, or sustenance, including cultural or tribal uses. State fish and wildlife agencies manage many of these species through hunting regulations. The following species are of value for their social, cultural, and economic benefits to visitors of the Ashley National Forest.

Current Conditions and Trends for Species of Interest

Moose

Although not rare here, moose are not easily seen on the Ashley National Forest. There is an abundance of suitable habitat for this species, which consists largely of riparian habitats. Moose are hunted on the Ashley, but only a few permits are issued each year because moose are considered a “once in a lifetime” species to hunt. Moose numbers on the Ashley National Forest, as well as on a regional scale, are trending downward and this trend is being studied to determine the cause. Moose are the largest big game species on the Ashley National Forest, having an average weight of about 1,000 pounds.

Rocky Mountain elk

Rocky Mountain Elk

Similar to mule deer, Rocky Mountain elk on the Ashley National Forest are considered a highly desirable species by many Ashley visitors. Visitors love to see elk herds and sportsman enjoy hunting them. Hunting brings in considerable economic benefits to local communities around the Ashley.

Elk numbers on the Ashley National Forest have risen as the Utah Division of Wildlife Resources has actively been trying to build the herd size. Although elk on the Ashley are primarily in Utah, they may also occur on the Wyoming side of the Flaming Gorge National Recreation Area. Calving often occurs away from human activity, since calving can be affected by human disturbance. Because of their size, elk are less affected by heavy snowpack during the winter months than deer. Similar to deer, hunting pressure and harvest from hunting can impact elk numbers.

Mule Deer

Mule deer are an iconic western big game species and are enjoyed by many wildlife viewing enthusiasts. Mule deer are one of the popular and most commonly hunted species on the Ashley National Forest. Mule deer hunting provides an important recreational activity on the Ashley and brings considerable economic activity to local communities during hunting season. Mule deer are found in a wide range of habitats and elevations on the Ashley National Forest. Population trends vary with habitat conditions and are primarily a result of annual precipitation and severity of winter snowpack. In addition to habitat conditions, pressure and harvest from hunting can impact mule deer populations. Most recent trends for mule deer populations on the Ashley National Forest have been upwards.

Conclusions and Future Considerations for Species of Interest

See page 40 for conclusions pertaining to all wildlife species on the Ashley National Forest.

Additional Information

Abeyta, Dan, Bob Christensen, and Allen Huber. 2017. Ashley National Forest Assessment, Species of Interest Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Social and Economic Conditions

When people think about national forests, they are probably not thinking about the words "social and economic conditions." Yet, since the national forests were created over 100 years ago, they have been managed to provide many uses and benefits for people all over the nation. These include natural resources, products, experiences, and many other amenities. Today, these uses and benefits are often referred to as "ecosystem services."

Local communities that are close to national forest land tend to be some of the greatest beneficiaries of the ecosystem services the land provides. It is because of this influence that the Forest Service planning regulations require us to assess social and economic conditions in the areas surrounding and most affected by each national forest.

Local National Forest Benefits and Uses

The Ashley National Forest's social, economic, and environmental benefits and uses are extensive. They include:

- agriculture related to livestock grazing
- clean air and water, productive soils, and wildlife habitat
- culture, including ancient rock art, sacred Tribal lands and locations, and historic buildings and structures
- educational facilities and volunteer programs that provide opportunities for people to connect with nature and learn about conservation
- employment, including jobs related to recreation, ranching, mining, oil and gas production, and timber
- Federal land payments to counties to help offset losses in property taxes due to non-taxable Federal lands within their boundaries
- forest products, including timber, firewood, and Christmas trees
- natural lands conservation, recreation, and scenery
- subsistence uses such as fish, game, plants, berries, and seeds
- water resources for agriculture, aquatic habitats, hydropower, and recreation

The Ashley National Forest's Area of Influence

Demographic and economic data are typically available at the county level, and social and economic influences are likely to extend beyond the boundaries of the national forest to local and regional communities. As a result, the area of influence is defined at the county level.

The Ashley National Forest falls predominantly within four counties on the northern border of Utah and southern border of Wyoming: Daggett, Duchesne, and Uintah Counties in Utah, and Sweetwater County in Wyoming. In addition, Uinta County, Wyoming, is in close proximity and has close economic ties to the Ashley. These primary five counties are considered the socioeconomic planning area. Additional secondary counties that have social and economic connections to the Forest include Utah and Wasatch Counties, Utah (which contain small portions of the Forest), and Summit County, Utah (see figure 6, next page).

The Ashley National Forest is a 2- to 3-hour drive from any major population center, and can be described as a rural forest. Key uses and activities that affect local economies include grazing, commercial timber harvest, oil and gas development, limited traditional hard rock mining, land- and water-based recreation, and viewing scenery and historic sites. These

natural resource-based lifestyles have resulted in several periods of boom and bust in local economies, with a recent boom and bust cycle related to oil and gas development.

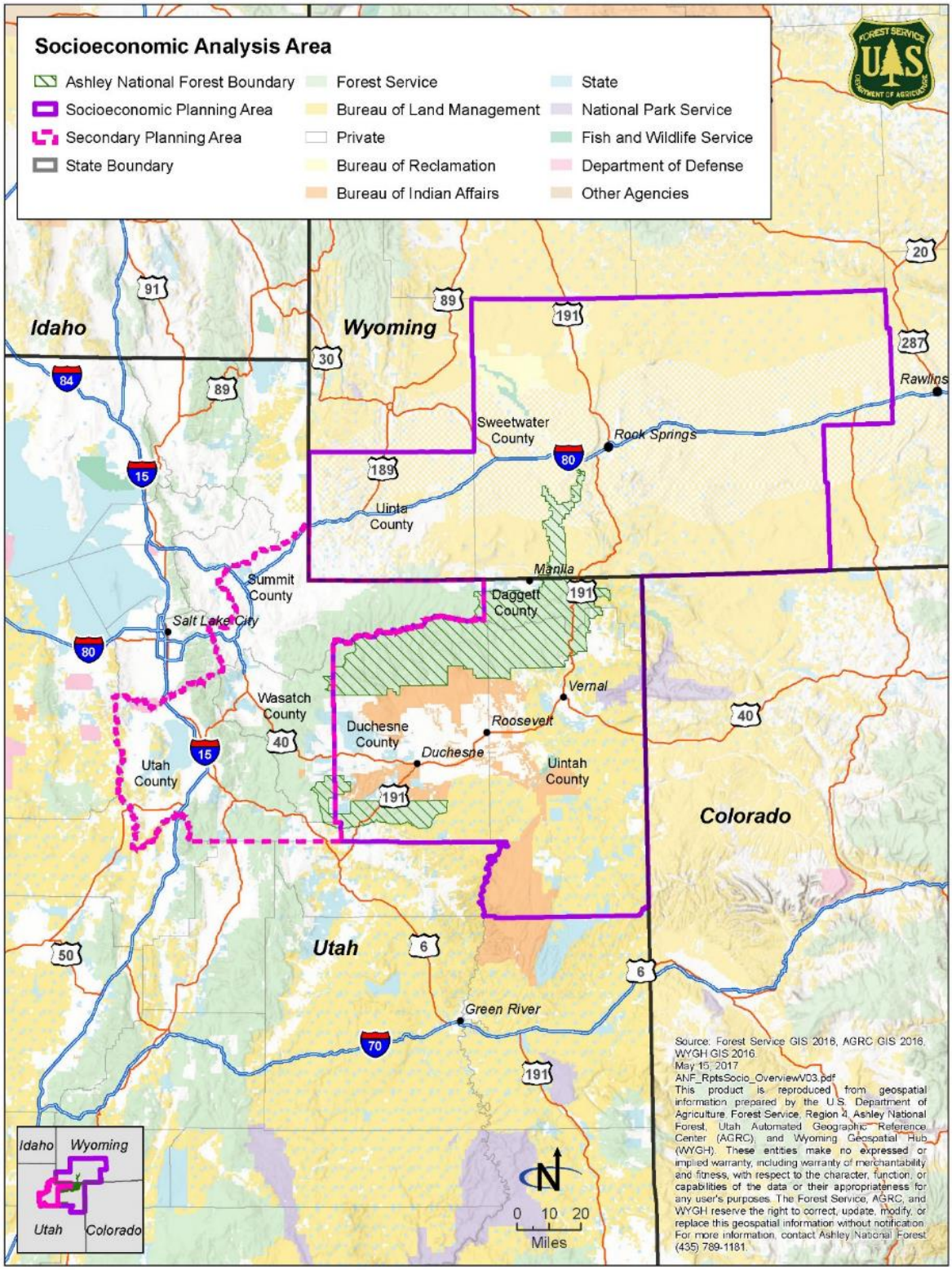


Figure 6. The Ashley National Forest's socioeconomic area of influence

Visitors to the Ashley come from all over the nation, with the High Uintas Wilderness and Flaming Gorge National Recreation Area being especially popular destinations. Visitor use monitoring indicates that most visitors are from northern Utah (especially the Uinta Basin and Wasatch Front) and southern Wyoming. See the “Recreation” section for more information

Area Demographics

Age

Different age groups have different needs, values, and attitudes concerning national forest management. A younger than average population can indicate the need for family-friendly activities and uses, such as a trail system with ranging degrees of difficulty, while an older than average population might increase the demand for easily accessible trailheads and camping. With the exception of Daggett County in Utah, most of the counties in the socioeconomic planning area have a higher proportion of children and young adults and lower proportion of people over 65. Daggett County has a median age of 53, well above average for both the U.S. and Utah. In addition, 25 percent of its population is over the age of 65.

Population

None of the five counties in the socioeconomic assessment area contains a major metropolitan area. Daggett County has the smallest population, with only 776 residents in 2015. Sweetwater County has the largest population of the four counties (almost 45,000), followed by Uintah, Duchesne, and Daggett Counties. Between 1990 and 2015, Duchesne and Uintah Counties had the highest population growth in the socioeconomic planning area. Both had growth rates near 60 percent; however, they remained below the Utah state growth rate of 65 percent. Despite significant losses in high-wage mining employment and related sectors in the socioeconomic planning area, 2015 data indicate that the population remains relatively flat, compared with 2014.

The five counties in the socioeconomic planning area have very low population densities (between 1.5 and 7.3 people per square mile) in comparison to the U.S. population density, which averages 79.6 people per square mile.

Population density provides a perspective on the availability of open space and recreational opportunities, civic infrastructure, population sustainability and growth potential, and a trend toward urbanization. The five counties in the socioeconomic planning area all have very low population densities (between 1.5 and 7.3 people per square mile) in comparison to the U.S. population density, which averages 79.6 people per square mile.

Education Levels

Education level is one of the most compelling indicators of economic success and well-being. Historically, communities with a more educated workforce tend to have higher incomes, have faster growth rates, and are better able to withstand economic downturns and recessions. As a whole, the socioeconomic planning area’s share of high school graduates is lower than the Utah and Wyoming state levels. Additionally, the five-county area has much smaller shares of individuals with bachelor’s degrees or higher than Utah, Wyoming, or the national average.

Housing

Housing statistics are important measures used to gauge the economic stability of a region. High rates of rental units can indicate trends such as a migrant workforce, seasonal tourism, or a sudden economic uptick in an area. Additionally, high rates of home ownership can predict long-term economic stability and a positive outlook on the region's economic future. An average of 74 percent of homes in the socioeconomic planning area are owner-occupied housing units, which is comparable to Utah, Wyoming, and the U.S.

Housing vacancy rates include housing units for rent, units rented but not occupied, units for sale, units sold but not occupied, units for seasonal recreational or occasional use, units for migratory workers, and other types of vacancies. In 2010, out of all the housing units that were classified as vacant, 93 percent in Daggett County and 80 percent in Duchesne County were categorized for seasonal, recreational, or occasional use. This is in comparison to only 22 percent of vacant homes in Uintah County, Utah; 13 percent in Sweetwater County, Wyoming; and 22 percent in Uinta County, Wyoming categorized for the same use. This indicates that vacation homes, second homes, and vacation rental properties are likely common in Daggett and Duchesne Counties.

Minority and Low Income Populations

The socioeconomic planning area is predominately Caucasian with very few minorities.[6] Duchesne and Uintah Counties in Utah have small populations of individuals who identify as Hispanic, and American Indians who are associated with the Uintah and Ouray Ute Indian Reservation. Reservation lands span a three-county area known as the Uintah Basin. It covers an area greater than 4.5 million square miles and shares boundaries with the Ashley National Forest. Sweetwater County has the largest population of individuals who identify as Hispanic or Latino with a rate nearly identical to the United States.

Employment

Employment and unemployment information for the socioeconomic planning area includes jobs supported directly and indirectly by national forest resources, as well as those supported by other State, Federal, and private lands. Figure 7 shows that from 2010 to 2016, the socioeconomic planning area maintained unemployment rates well below the national average and they withstood the Great Recession far better than the United States as a whole.[7] However, from 2014 to 2016, there was a spike in unemployment in Duchesne and Uintah Counties due to changes in markets related to the oil and gas industry.

Figure 8 shows the distribution of employment in the socioeconomic planning area. The largest employment sector is mining (19 percent), followed by government (15 percent) and retail (9 percent). The next largest sector is construction (8 percent), followed by a variety of service industries that have an employment distribution ranging from 1 to 7 percent. Agriculture is a relatively small piece of the economy (3.4 percent). Forest products, which

[6] Minorities are defined as individuals who are members of the following population groups: American Indian, Alaska Native, Asian, Pacific Islander, Black, or Hispanic.

[7] No employment rates were adjusted for seasonal employment (source: U.S. Bureau of Labor Statistics 2016).

includes the timber industry, is the smallest employment sector, accounting for only 0.04 percent of employment.

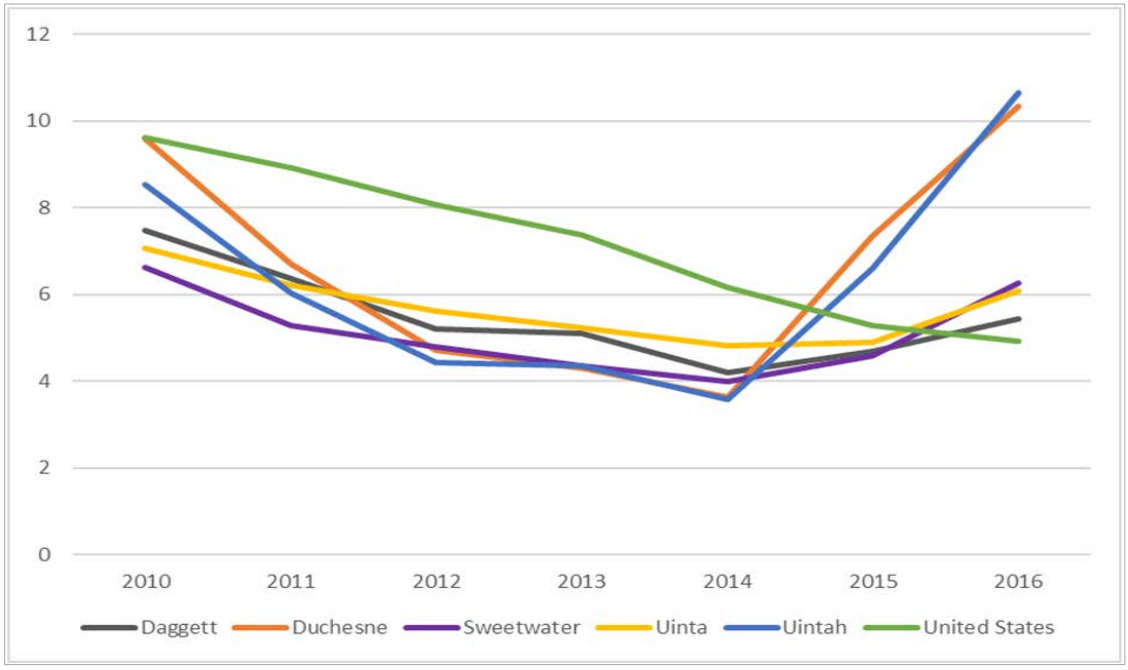


Figure 7. Average unemployment rate in the five-county planning area as compared to the United States

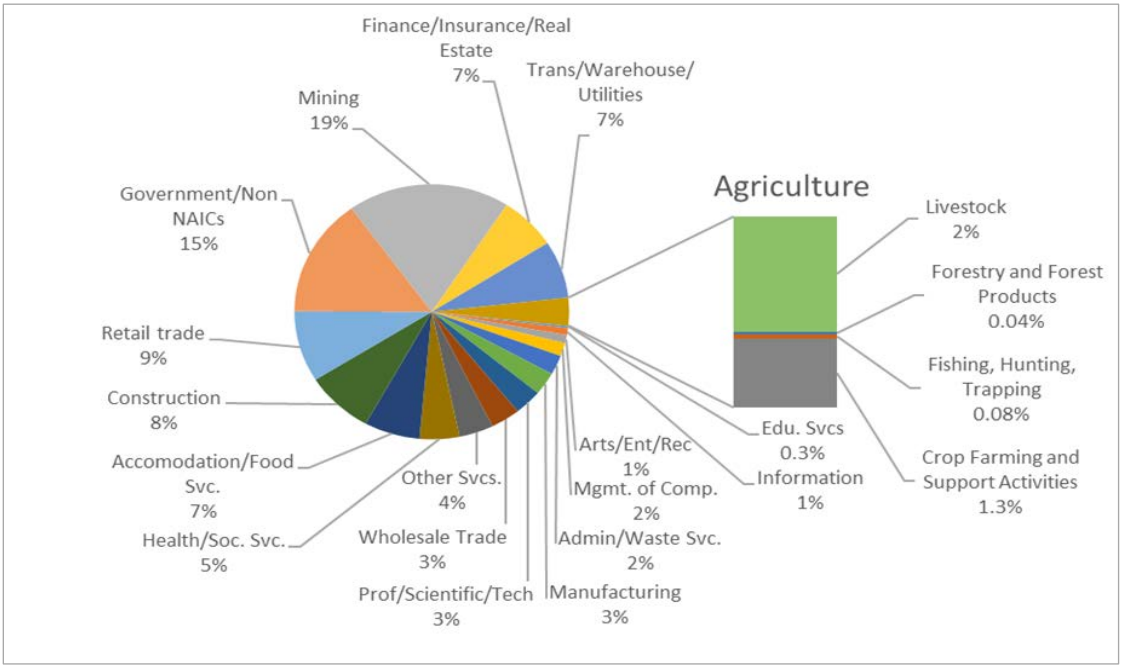


Figure 8. Types and percentages of employment in the socioeconomic planning area in 2014

Economic Well-being and Poverty

Income Levels

In 2014, the largest sources of labor income in the socioeconomic planning area were from mining and government industries. Between 2006 and 2014, the labor income from mining grew from 24 to 35 percent. At just 19 percent of employment, mining jobs pay well relative to other jobs in the area.

Labor income accounts for approximately 80 to 86 percent of total household earnings in the socioeconomic planning area, with the exception of Daggett County, where a large portion of the population is over 65 and living on retirement income. Per capita and median household incomes are close to the state and national averages, and they have risen marginally since 2010.

Poverty

Poverty level is an important measure of economic well-being within a region. People living in poverty may be more vulnerable to changes in national forest management or the availability of opportunities on the national forest. All five counties in the socioeconomic planning area currently experience poverty levels below the national average and have rates equal to or less than their respective states. Long-term trends (1989 to 2015) for the rest of the planning area have been comparatively low and flat, which means there has been neither a sharp reduction nor an increase in poverty over the period examined.

Local Communities

The local economy, historically based on agriculture and solid minerals mining, has diversified. Now, oil and natural gas among other forms of energy extraction and tourism are major industries associated with the Ashley National Forest; nevertheless, agriculture remains important. Rural areas such as those that surround the national forest are more commonly associated with natural amenities that national forests provide.

Communities adjacent to the Ashley provide multiple types of employment that are directly and indirectly supported by national forest activities, such as recreation, timber harvest, and energy and minerals development. The communities also provide support services for activities on the national forest, such as tourism and emergency services, and housing for Forest Service employees. Key communities adjacent to the Ashley National Forest include:

- **Vernal City, Roosevelt, and Duchesne (Utah):** These communities are within the Uintah Basin, where the economy has historically been tied to ranching, farming, mining, and logging. These are still important economic drivers of the region, in addition to energy development.
- **Manila and Dutch John (Utah):** These communities in Daggett County are rural with few commercial establishments. Most of the establishments are there to support recreation on Federal lands (83 percent of the county is under Federal ownership by the Forest Service or Bureau of Land Management). In addition to tourism, ranching is an important economic activity in these communities.
- **Green River and Rock Springs (Wyoming):** These are the largest cities in Sweetwater County. Oil and gas development and mining for trona (used for making glass, detergents, and many other products) and coal provide the economic foundation of the

county. The Flaming Gorge region, also in Sweetwater County, provides an important destination for many tourists, including hunters and anglers.

People with Connections to the Ashley National Forest

Of the many people and communities that have derived benefits from the Ashley National Forest, they all share one thing—a connection to the national forest landscape. What that connection is, however, varies greatly depending on what those people and communities value most. The following is a list of "communities of interest" associated with the Ashley National Forest with descriptions of their values and concerns.

- **Local residents** view the Ashley as a source for municipal water, recreational activities, employment, and an economic driver for tourism. Local residents tend to be concerned with management decisions that could affect recreational opportunities, access, traffic, the local economy, and wildfires.
- **Local governments** tend to be concerned with management decisions that could affect the local economy, or attract or deter new residents. Payments received from the Federal Government tied to Federal lands would also be an issue of importance to this group.
- **Conservation-minded individuals or groups** want to preserve the natural setting of the national forest. Their concerns tend to include management decisions that might affect recreational opportunities, scenery, wildlife, and vegetation. These individuals may include those who actively use the Ashley and those interested in the non-use values of the national forest, such as the preservation of special status wildlife for future generations.
- **Researchers and educators** would likely want to preserve the natural setting of the national forest. The ability to access areas for study and the funding for cooperative education programs would also be of interest.
- **Recreationists** include both local residents and destination visitors from communities outside the socioeconomic planning area. Many recreationists come from the Wasatch Front, which is the largest nearby population center. This user group includes picnickers, anglers, mountain bikers, road cyclists, off-highway vehicle users, hunters, hikers, backpackers, campers, horseback riders, and wildlife watchers. Recreational users tend to be concerned with management decisions that could affect national forest recreational opportunities and access.
- **Tribal groups** from the Ute Tribe use the national forest for subsistence and cultural activities. As discussed in the "Areas of Tribal Importance" section, some specific sites are used for ceremonial purposes or are important for collecting plants and materials for traditional cultural uses. This community would be concerned with management decisions that could change their access, gathering activities (for items such as teepee poles, traditional plants, or food), and cultural uses.

Members of the Ute Tribal Business Committee, 2014

- **Forest product users and industries** are interested in the availability and accessibility of forest products for commercial and noncommercial uses. Lumber mills, loggers, and log truck drivers make earnings from commercial timber harvesting. Area residents may use forest and woodland products for fuelwood. Surveys of Daggett, Duchesne, and Uintah County residents indicated that approximately 44 percent of respondents favored maintaining timber harvesting on public lands at or near current levels.
- **Mining interests and oil and gas developers** are interested in maintaining areas available for mining or oil and gas leasing and development, and decisions that could affect the timing and ability to access these resources. Surveys of Daggett, Duchesne, and Uintah County residents indicated that approximately 41 percent of respondents favored maintaining mineral development on public lands at or near current levels.
- **Livestock grazers and ranchers** are a part of the area's history, culture, and economy. With limited areas of private land for grazing, ranchers depend on national forest lands for livestock forage. Some families have held grazing permits with the Forest Service for generations. Ranchers and farmers tend to be concerned about Federal regulations, decisions that could affect the availability of national forest land for grazing, and changes that could affect their way of life.
- **Low-income and minority populations** could be affected by forest management decisions, depending on the type of management that occurs in relation to where those populations reside. Although the socioeconomic planning area as a whole contains fewer low-income or minority individuals than the state average, there may be communities with large minority or low-income populations, or small groups such as Native Americans or migrant workers who rely on the national forest for items like game or fuelwood.

Ecosystem Contributions of the Ashley National Forest

The benefits people receive from nature are referred to as "ecosystem services." Ecosystem services can include items measured in the traditional economic market (as discussed in the "Economic Contributions" section below), as well as those that contribute to improving the quality of life for area communities but are not measured in monetary ways (nonmarket contributions). Ecosystem services can be divided into four categories of services: provisioning, supporting, regulating, and cultural services.

Provisioning Services

Provisioning services are broadly described as products derived from ecosystems. Examples of such products include raw materials, mineral and energy products, water, medicinal resources, and forage. On the Ashley National Forest, the key provisioning services including wood products, mineral and energy products (oil and gas), forage for livestock, and animal products from hunting and fishing. Harvest and extraction of these resources, and maintenance of the habitat to support long-term use of these resources, contribute to recreation, jobs, food sources, and tourism dollars in the local area.

Cultural Services

Cultural services are defined as benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, aesthetic experiences, and cultural heritage values. The key cultural services on the Ashley National Forest are aesthetic values, cultural heritage values, and recreation. Agriculture, including livestock grazing,

represents an activity with cultural ties to the planning area. Livestock grazing contributes to cultural services through preservation of open space and pastoral scenery, as well as by preserving traditional ways of life. Landscapes, wildlife, and other features in the planning area provide scenic resources appreciated by local residents, recreationists, and other visitors. Recreationists, local outfitters, and guides directly benefit from these landscapes and features, while local businesses benefit from spending by visitors. Participation in recreational activities can also support wellness and personal enrichment.

Regulating Services

Regulating services are defined as benefits obtained from the regulation of ecosystem processes. Examples include carbon sequestration and climate regulation, erosion prevention, and purification of water and air. Water regulation represents a key service on the Ashley National Forest, which contains physical, chemical, and biological characteristics that enable vegetation and soil to filter and absorb surface water. This replenishes underground aquifers and moderates runoff during rainstorms. Well-functioning ecosystems on the Ashley National Forest help maintain the integrity of watersheds and provide local communities with clean drinking water and water suitable for agricultural uses, recreation, and wildlife habitat.

Supporting Services

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

Economic Contributions of the Ashley National Forest

The Ashley National Forest contributes economically to the surrounding region both directly through Forest Service employment, commodity revenues, and tax subsidies, and indirectly through mineral and energy development, agriculture and timber industries, and tourism, and recreational spending. The economic impact analysis area is comprised of Daggett, Duchesne, Uintah, and Sweetwater Counties, which represent the functional economy for people living and working around the planning area. Although some effects may occur outside of this area, the majority of the effects will likely occur within the four counties, which contain almost the entire planning area. Quantitative contributions to the local economy below are estimated using this economic analysis area.

The Ashley National Forest contributes economically to the surrounding region directly through Forest Service employment, commodity revenues, and tax subsidies, and indirectly through mineral and energy development, agriculture and timber industries, tourism, and recreational spending.

Forest Service Employment

Employment by the Forest Service represents a minor contribution to the area economy. In 2014, the number of people employed by the Ashley National Forest accounted for only 2.7 percent of all the government jobs in the socioeconomic planning area.

Government Revenue Sharing

Because public lands take up areas that otherwise might generate property tax revenues to counties, there are mechanisms in place to ensure local governments are compensated. These are referred to as "payments in lieu of taxes" and are meant to subsidize local government services such as schools, roads, and fire suppression. These payments are in addition to other Federal receipts (such as timber harvesting, grazing, and oil and gas leasing). Payments awarded to Uintah and Sweetwater Counties exceeded $3 million each in 2015. Duchesne County received nearly $2.5 million, and Daggett County received less than $500,000.[8] Information is not included for Uinta County, Wyoming, due to a lack of Ashley National Forest lands in that County.

Another source of Federal revenue to counties comes from the Secure Rural Schools and Community Self-determination Act of 2000, which was enacted to assist rural communities negatively affected by the decline in timber harvesting revenues from Federal lands. Total payments from this program to socioeconomic planning area counties were approximately $1 million in 2014 for Daggett, Duchesne, Uintah and Sweetwater Counties.

National Forest Resources

Recreation and Tourism

Tourism and recreation on the Ashley National Forest supported an estimated 26 full or part-time jobs and $800,000 in labor income in 2014 to the region's economy. Studies by Headwaters Economics in 2012 indicate that as extractive resource uses decline throughout the West, the economic importance of recreation and protected lands is increasing. Recreation on the Ashley National Forest represents an economic sector of growing importance for some local communities. Recreation opportunities include a broad spectrum of experiences, from hunting and off-highway vehicle use to hiking and wildlife viewing.

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

Wood Products

Timber harvesting represents a traditional source of employment in the socioeconomic planning area. Forest products from the Ashley are not currently a major economic driver in the local or regional economy due to the small amount of area suitable for harvest and the generally lower commercial value of wood products harvested. The Ashley National Forest timber harvesting program contributed 12 jobs (full and part-time) and $839,000 in labor

[8] Revenues is based on population, receipt sharing payments, and the amount of Federal land within an affected county. Revenue reported by county includes payments for all federally managed land in the county.

income to the region's economy. Labor income estimates include income from saw timber and removal of poles, posts, and fuelwood. Locally, wood product sales help support a number of sawmills and smaller businesses, and provide an inexpensive source of fuel wood for area residents. Timber production and timber harvest are important tools to use as part of fire risk management.

Rangelands and Grazing

As stated in the "Rangelands and Grazing" section, there are 92 grazing permittees on the Ashley National Forest, and the actual use levels of grazing on the Forest supports approximately 127 jobs (in Daggett, Duchesne, Uintah, and Sweetwater Counties). The approximate labor income for grazing is $2.78 million. Most typical ranches depend only partially on federal land grazing for forage; however, economic studies have shown that this forage source can represent a critical part of their livestock operation, particularly as a summer forage source. Federal livestock grazing can affect livestock production and the viability of individual agricultural operations. Grazing is likely to continue to represent an important economic sector for some communities and can help to maintain a traditional cultural setting.

Watersheds

Watersheds of the Ashley National Forest provide essential services to local communities by providing irrigation water, municipal water, and recreational opportunities. They also support a variety of natural resources that sustain forest and ecosystem health. In a 2008 Utah survey, Daggett, Duchesne, and Uintah County respondents said that having water resources from public lands was very important for agriculture, fish and wildlife, and municipal uses. Many also believed that public land managers should increase development of water storage and delivery systems on public lands.

Fish, Wildlife, and Plants

Plants and animals of importance on the Ashley National Forest include those used by the public for hunting, fishing, trapping, gathering, observing, or sustenance, including cultural and Tribal uses. Approximately 49 percent of visitors to the Ashley in 2012 participated in wildlife viewing, 30 percent in fishing, and 13 percent in hunting. In addition, the preservation of special status species may represent an important nonmarket value for some visitors and area residents. These activities contribute substantially to the local economy and to the culture of the surrounding communities. The Ashley National Forest is known to provide a high-quality hunting experience for a variety of game. It is popular with both locals and visitors who hire outfitters for hunting. Maintenance and enhancement of habitat supports the continued presence of fish and wildlife for recreation opportunities.

Energy and Minerals

In 2014, mineral production on the Ashley National Forest supported 40 full and part time jobs and $5 million in labor income. These jobs occurred primarily due to oil and gas production on the Ashley National Forest. Estimates represent the recent peak of oil and gas production in the region and the United States. In 2014, oil prices plummeted and production in the region declined. Oil and gas remains an important industry in the area and on the Ashley National Forest. However, oil is susceptible to market conditions, and employment and income estimates presented here will vary based on market conditions.

Conclusions and Future Considerations

Management decisions for the Ashley National Forest influence the economic and social setting for area communities. Based on current economic modeling and social input, the Ashely represents a minor contribution to local economic and social stability in the region overall; though contributions at the community level may be more significant. Economic contributions from the economic analysis area (Daggett, Duchesne, and Uintah and Sweetwater Counties), are summarized by key resource category in table 2 (next page).

Table 2. Estimated annual employment and labor income contributions from the Ashley National Forest by resource program, 2014

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

* Employment and labor Income data for Recreation and Wildlife and Fish Recreation includes non-local visitor spending only.

Maintaining a balance of uses in future management would support the ecological sustainability of consumptive and nonconsumptive uses on the Ashley National Forest and allow for future use by area residents and visitors to support economic contributions and quality of life.

Additional Information

Environmental Management and Planning Solutions, Inc. 2017. Ashley National Forest Assessment, Socioeconomic Report. Ashley National Forest Supervisor's Office, Vernal UT.

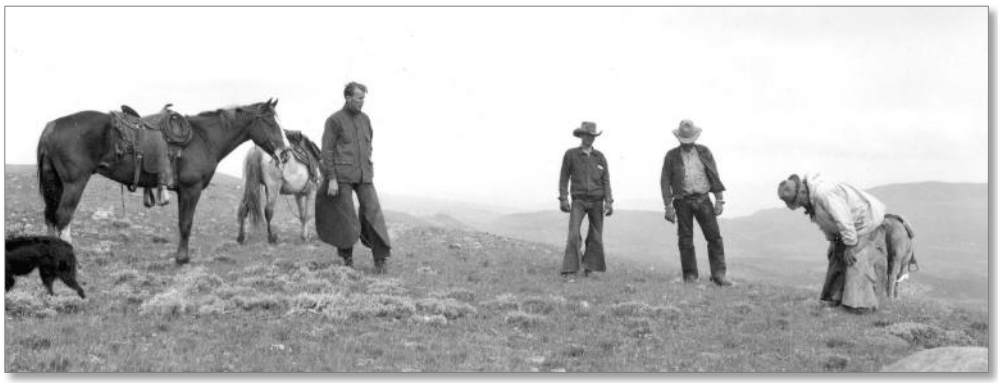
Sandhoff, Nikki. 2017. Ashley National Forest Assessment, Economic Environment Report. Ashley National Forest Supervisor's Office, Vernal UT.

Both reports are available on the Ashley National Forest planning website at: https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Rangelands and Grazing

Livestock grazing has been an important part of the local economy and culture for over a century in the socioeconomic planning area. Cattle and sheep ranching was a primary economic activity during the late nineteenth and early twentieth centuries for the communities surrounding the Ashley National Forest. Although it is no longer one of the major economic contributors in the area, ranching families maintain deep connections to the lands in and around the national forest, and strongly value use of the land as part of their heritage.

Overgrazing of lands across the West at the turn of the 20th century was the catalyst for the Forest Service to begin regulating grazing on the national forests. Since then, grazing has been included as one of the many uses of national forest lands. In 1905, Forest Supervisor William Anderson established some of the first grazing allotments on the lands of the Ashley National Forest to begin managing grazing in the national forest.



A range inspection trip on the Ashley National Forest in 1948

Current Conditions and Trends of Grazing and Rangelands

Most typical ranches depend only partially on Federal land grazing for forage; however, economic studies have shown that this forage source can represent a critical part of their livestock operation, particularly in summer. Federal livestock grazing affects livestock production and the viability of individual agricultural operations. For some communities, grazing is likely to continue to represent an important economic sector and will help maintain a traditional cultural setting.

Grazing Levels

Grazing on national forest lands is managed on permitted allotments, which are designated areas where the number of livestock and period of use are stipulated. There are currently 92 grazing permittees and 65 active grazing allotments on the Ashley National Forest (see map next page).

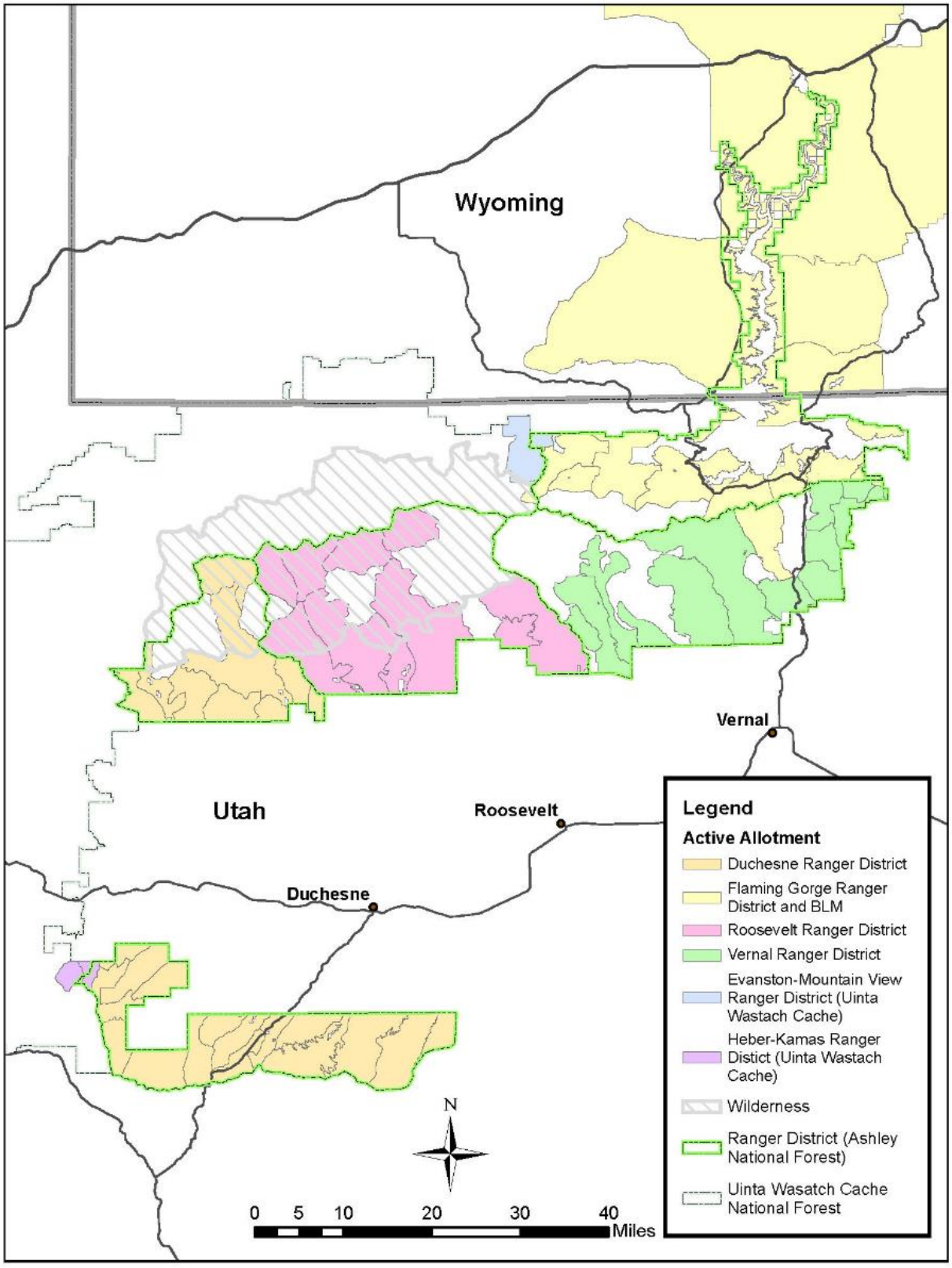


Figure 9. Range allotments on the Ashley National Forest

Permitted livestock occupancy on allotments is measured in head months. One head month is one month's use and occupancy of the range by one animal.[9] Forage consumption is measured in animal unit months or AUMs.[10] The 1986 forest plan allows for continued use of forage by domestic livestock, assuming forage at or near 1986 levels. The plan specifies that the Ashley National Forest provides grazing for a total of about 75,000 AUMs each year.

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

If all permitted head months were grazed, it would support 162 jobs and $3.5 million in labor income annually. Based on actual use in 2016, grazing on the Ashley National Forest directly or indirectly supported up to 127 jobs and $2.8 million in labor income in Daggett, Duchesne, Uintah, and Sweetwater Counties.

Table 3 shows trends of grazing levels between 1980 and 2016 by ranger district. Grazing levels have increased on the Vernal Ranger District over time, but almost proportional to the amount of grazing that has decreased on the Duchesne Ranger District. Overall, across the Ashley National Forest, permitted grazing levels since 1980 have declined by approximately 1 percent.

Table 3. Trends in permitted grazing levels on the Ashley National Forest

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

1. Roosevelt and Duchesne are managed as the Roosevelt-Duchesne District
2. AUM data are variable, based on levels in the database at time information was viewed

Factors that Affect Livestock Grazing

Market demand for agricultural products affects the price for livestock at market and the related economic contributions from this resource. The amount of grazing land and rangeland in the United States is expected to continue slowly declining over the next 50 years. This would be the case particularly in areas with more rapid population increases and

[9] For grazing fee purpose, is a month's use and occupancy of range by one animal, except for sheep or goats.

[10] One animal unit month is the amount of forage a 1,000-pound mature cow and calf consume in a 30-day period, which is about 780 pounds of dry weight forage.

increases in land values. Grazing is likely to continue to represent an important economic sector for some communities and will help to maintain a traditional cultural setting.

Grazing capacity may also be impacted by rangeland conditions and forage availability, which are in turn influenced by the level and timing of precipitation. If vegetation changes occur, grazing capacity would be affected. Forest Service management decisions can also affect the level of grazing, influencing the amount of acres available to grazing sometimes for the protection of other resources or to prioritize other resource uses.

Rangeland Condition and Trends

When allotment conditions are examined, common trends emerge that are impacting rangeland conditions. While conditions vary by allotment, some common issues include the following:

- Increases in invasive annuals is associated with decline in forage for cattle, and they mark a decline in ecological condition. Cheatgrass, storks bill, tumble mustard, and musk mustard are invasive plants that are increasing in some allotments.
- Return of sagebrush and increase of less productive and less palatable herbaceous species are creating a declining forage base for cattle.
- Fire, where it occurs, decreases forage in the short term but has generally increased forage in the long term. Due to historical fire suppression, an encroachment of conifers has affected some sagebrush habitat.
- Drought has resulted in a temporary decline in forage in some allotments.
- Grazing has generally been found to be compatible with aspen regeneration management in Ashley National Forest allotments.
- Adjustments in management and monitoring have been needed in some high use riparian areas.

> ***Most rangelands on the Ashley National Forest are in good condition with sustainable trends. Areas of rangeland declines can be attributed to increases in invasive plant species, drought, and ingrowth of sagebrush and other less palatable plants. These trends are likely to continue into the future.***

Rangelands on the Ashley National Forest were evaluated using watershed condition data. This approach looks at factors such as riparian vegetation condition, threats from invasive species, and overall rangeland condition. In an analysis of 123 subwatersheds on the Ashley National Forest in 2011, 113 were reported to have rangelands in good condition, 9 were in fair condition and 1 was reported as poor condition. Most of the fair and poor condition rangelands are located in the northernmost portion of the Ashley in the Wyoming portion of the Flaming Gorge Unit. Riparian vegetation conditions were reported as good in 80 of the subwatersheds, with the remainder reported mostly as fair, and only 1 as being in poor condition. Long-term trend studies on the Ashley National Forest generally support these conclusions.

The Importance of Livestock Grazing to Local Communities

Livestock grazing on the Ashley National Forest has been described by local communities as having an important role in economics, lifestyle, and benefits to forest health. Based on input

in a 2008 beliefs and values study, agricultural heritage is of particular importance in the region. Commenters noted that oil and gas jobs have always been up and down, but agriculture has been steady. Sustaining grazing is also perceived to offer benefits to the custom and culture of rural communities. The work ethic of ranching is believed to express fundamental American values that are embedded in the culture of the West. Ranching participants emphasize that rural values and lifestyles can be undermined by some management practices. In addition, commenters note that although most people who are in ranching or farming probably have a second job just because of the industry, there is a strong lifestyle value in being in agriculture, and that it affords the opportunity to teach children the value and benefit of hard work.

Conclusions and Future Considerations

Livestock grazing on the Ashley National Forest has been an important part of the local economy and culture for over a century, and plays an important role in the economics and lifestyle of the local communities. Most rangelands on the Ashley National Forest are in good condition, but some areas have been affected by increases in invasive plant species, drought, and conifer encroachment that have contributed to reduced forage production.

Management of rangelands have changed since the 1986 Forest Plan. Adaptive management based on long-term trend monitoring has been used more regularly to ensure the sustainability of rangeland resources and other ecological services. Also, desired conditions, goals, objectives, and standards and guidelines for rangeland and grazing management in the Ashley's 1986 plan are vague or not measurable. The inventory used to evaluate rangelands for the 1986 forest plan was primarily concerned with forage value and less concerned with ecological values at the plant community level. Likewise, many of the standards and guidelines are direction on how the range program should be administered rather than the standards and thresholds that should be monitored to measure the ecological health of rangelands and the effects of grazing on these rangelands.

Additional Information

Environmental Management and Planning Solutions, Inc. 2017. Ashley National Forest Assessment, Socioeconomic Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Timber and Other Forest Products

One of the reasons the national forests were created was because in the East and Midwest, forests were being cut down at alarming rates. President Theodore Roosevelt became concerned that the same fate would quickly befall the West, and so he pressed Congress to create and pass the Forest Reserve Act in 1891. This legislation set aside areas primarily to protect forests and watersheds. Then in 1905, the forest reserves were converted to national forests to be managed by the Forest Service. The agency was given a unique mission, which is still relevant today: to sustain healthy, diverse, and productive forests and grasslands for present and future generations.

One of the key words in Forest Service management is “sustainability.” Sustainability is a key part of conservation— the capability to meet the needs of the present generation without compromising the ability of future generations to meet their needs. Management of timber on national forest lands has evolved greatly since the Forest Service was established. Following World War II, harvest increased significantly. Many towns near forests in the West grew economies based on the timber industry. However, following the environmental movement of the 1970s, new regulations, and growing social concerns about clearcutting and endangered species in the 1980s and 1990s, the amount of timber harvest on national forests declined sharply, including on the Ashley National Forest (figure 10).

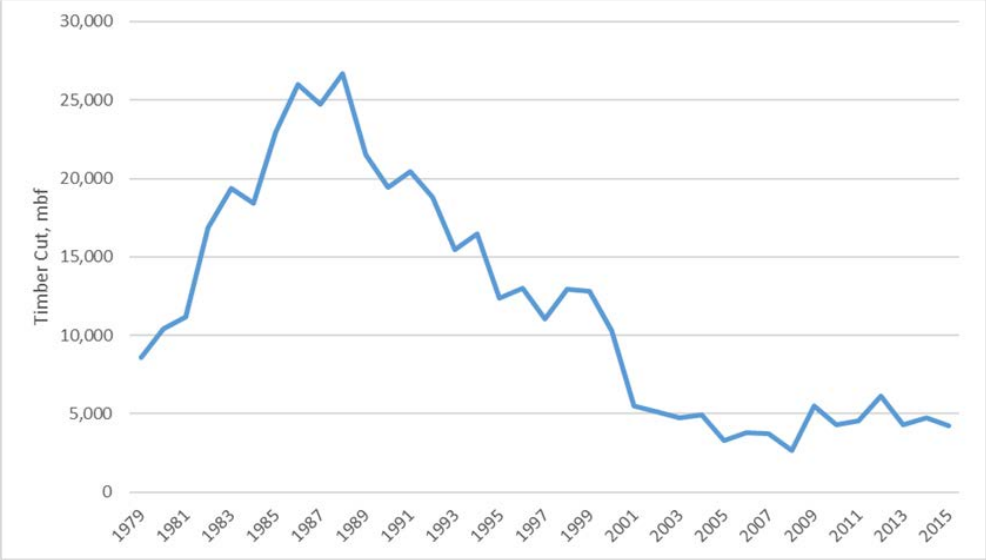


Figure 10. Timber harvested (in thousand board feet) from the Ashley National Forest between 1979 and 2015

Timber Production on the Ashley National Forest

In the early 20th century, the Ashley produced a moderate amount of lumber from the Uinta Mountains to prompt the development of mills in nearby communities. Production peaked in the late 1980s at 27 million board feet. Yet, compared to some national forests in the West, timber production on the Ashley National Forest has not been a significant industry due in part to the types of trees available for lumber. Forest products consist of relatively low-value products (smaller-diameter wood and shorter trees), so commercial interest in bids for wood sales is low.

Wood Product Conditions and Trends

In 1986, the allowable total sale program quantity set for the forest plan was 21 million board feet per year, based on 528,000 acres designated as suitable for timber production. The average amount of timber harvested on an annual basis in the past 10 years was approximately 11,557 hundred cubic feet or 5.7 million board feet. Fuelwood represents approximately 49 percent of material removed, post and poles represent approximately 20 percent, and softwood saw timber represents the remainder.

Table 4. Average annual timber production on the Ashley National Forest (2006-2015)

Type of Product	Hundred Cubic Feet (CCF)	Thousand Board Feet (MBF)
Harvest – softwood saw timber	3,448.8	1,724.4
Poles	1,405.4	702.7
Posts	983.5	491.8
Fuelwood	5,719.0	2,859.5
All other products	0.0	0
Total	11,556.7	5,778.4

Note: A conversion factor of 2 CCF per thousand board feet was used to provide an approximation of board feet.

Fuel wood represents an important fuel source for some individuals in the socioeconomic planning area. With the exception of Sweetwater County, Wyoming (where only 1.5 percent of homes use wood as primary fuel source), all socioeconomic planning area counties have more than 6 percent of homes where wood fuel is a major heating source. In Daggett and Duchesne Counties, Utah, this figure is 15 and 12 percent, respectively.

Demand for sawtimber material has remained relatively constant in recent years. Fuelwood consistently represents the bulk of forest products sold from the Ashley National Forest.

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

Conditions of the forests on the Ashley have also been impacted by a variety of factors including lack of natural fire. In areas where fires have been lacking due to a century of active fire suppression, forests are growing dense and becoming more susceptible to insects and diseases. Beetle outbreaks have become more prevalent in Douglas-fir trees, and have resulted in significant mortality in recent years. If these trees are desired for wood products, they must be harvested quickly after they die. In addition, the risk of severe wildfire has increased in these areas, which presents a risk for further timber loss as well as damage to resources such as soil, water, and wildlife

Conclusions and Future Considerations

Timber and woodland products are a traditional use of national forest resources and support local businesses. Fuel wood is also important for some local individuals and communities as a source of heating fuel. Timber harvesting can be an effective tool for wildfire risk management and to keep forests healthy. Timber harvesting can help to maintain ecosystem integrity and the ability of a forest ecosystem to support many ecosystem functions and services.

Timber harvests can be used to reduce hazardous fuel loading, maintain tree species diversity, reduce undesirable stand densities (the number of trees in a specific area), and promote desirable stand structures (the spatial arrangement of trees by size or age). Even though much of the timber on the Ashley National Forest is thought to be of low value, timber purchasers have participated in creating these desired forest conditions in exchange for the harvested timber. Timber harvesting can be an economical method to manipulate the forest vegetation to meet management objectives, because the timber value can help offset some of the implementation cost.

Timber harvesting and processing can require significant private capital investment. Timber companies have indicated a reluctance to make substantial capital investments, because the Ashley National Forest cannot legally make an assurance of a consistent long-term supply of timber for harvesting. Purchasers have also expressed concerns about the harvest methods and product mix of the timber being offered. The timber companies have stated that they need enough potential profit on these timber sales to stay involved financially and compete. Without a reasonable assurance of profitability, timber harvesting could be hindered as a viable forest management tool on the Ashley National Forest.

Concerns related to the timber resource on the Ashley National Forest include:

- There has been a significant level of tree mortality since the 1986 forest plan was developed, caused mainly by bark beetles and other factors such as lodgepole pine dwarf mistletoe.
- The area that can be actively managed for timber production has declined significantly due to the 2001 Roadless Rule. This rule severely restricts the cutting of trees on approximately two-thirds of the area in the Ashley National Forest identified as suitable for timber production in the 1986 forest plan.
- There are some inconsistencies between the 1986 forest plan and Forest Service Handbook direction. For example, the 1986 Forest Plan makes no allowance for exceeding the maximum opening size due to catastrophic conditions as the result of wildfires, insect and disease attack, or windstorms as the Handbook now does (FSH 2909.12, Chapter 60, Section 64.21c).
- The types, size, and quantity of timber currently available for harvest has changed significantly since the 1986 forest plan was developed.

Additional Information

Environmental Management and Planning Solutions, Inc. 2017. Ashley National Forest Assessment, Socioeconomic Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Energy and Mineral Resources

The Ashley National Forest includes quite a variety of energy and mineral resources. People have been using and benefitting from these resources for many years.

Energy resources are classified either as renewable energy (solar power, hydropower, wind energy, biomass, and geothermal energy), or as nonrenewable energy resources (crude oil, natural gas, coal, tar sand, and oil shale). The nonrenewable energy resources are typically considered “leasable” minerals, and are managed as such.

Mineral resources are categorized into three types, based on the different laws that apply to each type. These include:

- leasable minerals (specific minerals including crude oil, natural gas, coal, sodium, phosphate, and others),
- locatable minerals (rare minerals such as gold and silver), and
- salable minerals (common materials such as landscaping boulders or sand and gravel).

Energy and mineral resources provide the raw materials that support and contribute to all aspects of modern society and technology. It is the policy of the Forest Service to "foster and encourage" responsible minerals development. Management of each type of energy or mineral resource requires consideration of applicable laws and agency regulations, jurisdiction of other Federal or State agencies, and valid existing rights (mining claims, mineral leases, and private mineral rights). Ownership of valid Federal mining claims and mineral leases grants legal property rights for exploration, development, and removal of the respective mineral resources.

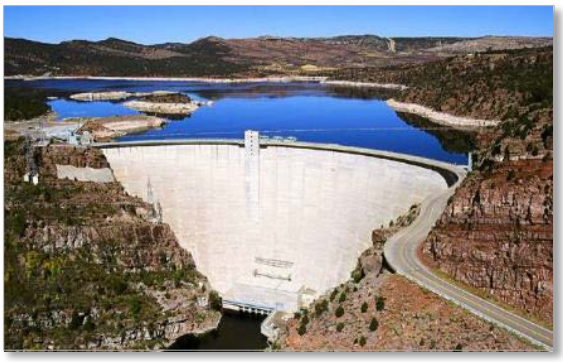
Energy and mineral resources provide the raw materials that support and contribute to all aspects of modern society and technology. It is the policy of the Forest Service to foster and encourage responsible minerals development.

Management of mineral resources is primarily responsive to industry proposals and mineral rights, and primarily guided by laws and regulations rather than forest plans. Additional guidance at the individual national forest level often duplicates existing laws and regulations, or conflicts with legal rights of mining claim or mineral lease owners.

Current Conditions and Trends of Energy and Mineral Resources

Renewable and Nonrenewable Energy

The primary kind of renewable energy being extracted from the Ashley National Forest is hydropower, with dams at Flaming Gorge Reservoir and a few smaller reservoirs. Other forms of renewable energy, such as wind power, solar, geothermal and biomass energy have not seen similar interest or development within the Ashley National Forest. This is partially due to the low potential for these resources relative to other areas in the country. It is also because of competition from abundant nonrenewable energy sources in the immediate and surrounding areas.



The Flaming Gorge Dam

The Flaming Gorge Dam, which generates a substantial amount of electricity, is operated by the Bureau of Reclamation. Very small hydropower operations also exist at Yellowstone Lake and in Uinta Canyon, both within the Roosevelt Ranger District. Although there is potential for other hydropower generation due to the large topographic variations across the Ashley, the potential is small, relative to other potential energy sources.

Nonrenewable energy resources on the Ashley are abundant and include crude oil, natural gas, coal, tar sand, and oil shale. Since all of these nonrenewable energy resources are typically classified and managed as leasable minerals, they are discussed further under that heading below.

Leasable Minerals

The Ashley National Forest contains abundant leasable mineral resources, including crude oil, natural gas, coal, tar sand, oil shale, gilsonite and elaterite (hard natural tar), sodium minerals, and phosphate. Of those, only the crude oil, natural gas, sodium, and phosphate resources appear to have significant economic potential for current or near-future development.

For leasable mineral operations on National Forest System lands, the Forest Service manages aboveground operations and resources, while the Bureau of Land Management manages the leases and belowground operations and resources. Active mineral leases on the Ashley National Forest include numerous oil and gas leases within the eastern part of the South Unit, and a small area of sodium leases within the Flaming Gorge Ranger District.

The 1986 Ashley forest plan provided direction for leasable mineral development, but imposed few additional restrictions beyond those already decided by laws or regulations. The 1997 Western Uintah Basin Oil and Gas Leasing Environmental Impact Statement and Record of Decision amended the 1986 plan by providing guidance specifically for leasing and development of oil and gas resources within the Ashley National Forest. The 1986 Ashley forest plan was also amended by the 2015 Greater Sage Grouse Environmental Impact Statement and Record of Decision, which added guidance for leasable minerals development within sage grouse habitat. The different kinds of leasable mineral resources are discussed below.

Oil and Natural Gas

There are numerous oil and gas leases on the South Unit. Although ownership of individual leases varies, oil and gas leases on the South Unit are currently operated by either Berry Petroleum (about 25,900 acres) or Vantage Energy (about 49,500 acres). Development of those leases currently includes 160 oil and gas wells, drilled and operated from 51 well pad locations, along with needed product tanks and equipment, access roads, and natural gas pipelines.

All but one of the producing oil and gas wells on the Forest are operated by Berry Petroleum. Berry Petroleum currently produces about 316,000 barrels of crude oil per year from wells on the Ashley National Forest, along with 58,000 barrels of natural gas liquids (condensate), and 1.5 million cubic feet of natural gas.

In addition to the existing oil and gas developments, about 50 additional oil and gas wells have been proposed and approved for development but have not been drilled. An approved Master Development Plan for Berry Petroleum's lease area includes numerous other oil and gas wells that have not yet been evaluated or approved in site-specific detail. It is not known whether any of these additional wells will actually be drilled in the future.

Oil and gas wells on the Ashley National Forest

The drivers, scale, and nature of exploration and development of oil and gas resources are largely dependent on changes in global market prices, interest by industry, and competition from renewable energy sources, all of which are outside the control of the Forest Service. The drop in crude oil prices starting in early 2014 is the primary reason why development of new oil and gas wells has been delayed on the Ashley National Forest. Whether additional wells are drilled, or whether additional developments are proposed or approved in the future, depends largely on future market prices and public demand for crude oil and natural gas resources.

Coal

Although several coal deposits are known or suspected within the Ashley National Forest, they are either prohibitively deep, or are too small or impure for significant economic development. Large coal deposits existing near Price, Utah are suspected to continue at great depth, beneath the western portions of the South Unit of the Ashley National Forest. Such resources are speculative, and the great depth likely prohibits economic development.

Tar Sand

Tar sands are simply porous sandstones or other rocks, where the pore spaces in the rocks are filled with solid or semi-solid hydrocarbon tar. There are tar sand deposits near the mouth of Whiterocks Canyon, on the Vernal District, that have not been leased for exploration or development. There are smaller uneconomic and undocumented tar sand outcrops within the South Unit and elsewhere on the Ashley.

Oil Shale

The Ashley National Forest contains large areas with known and suspected deposits of oil shale, located within the Green River Formation. These deposits underlie large portions of the Flaming Gorge and South Unit areas. Although widespread, the known oil shale deposits within the Ashley National Forest are relatively thin and impure, compared to similar but larger and richer deposits elsewhere. For this reason, commercial development of oil shale is not likely to occur on the Ashley within the foreseeable future.

Gilsonite and Elaterite

Although several deposits of these minerals are known to occur on the Ashley National Forest, they are poorly documented. Known deposits are likely prohibitively small for development, compared to other nearby areas.

Sodium Minerals

Trona is a leasable sodium mineral mined and used to produce soda ash, which is an important industrial chemical. The largest known trona deposit in the world (estimated at 127 billion tons) lies deep underground, next to and partially underneath the Flaming Gorge National Recreation Area. All active mining operations for trona lie outside the Ashley National Forest, but there is an active 40-acre sodium mineral lease on the national forest.

When the Flaming Gorge National Recreation Area was established, it was deliberately left open to future mineral leasing on the condition that lease developments would have no surface disturbances or facilities. Although trona deposits could be developed beneath the recreation area from surface facilities on adjacent lands, it is not likely to occur in the near future. At current production rates, the trona deposits being mined on adjacent lands are expected to last more than 2,000 years.

Phosphate

A very large phosphate deposit is being actively mined at the Vernal Phosphate Mine, located on private lands in the Brush Creek area, right next to the Ashley National Forest. This mining operation produces about 4 million tons of phosphate ore per year, employing 160 people at the mine, and another 400 people in Rock Springs Wyoming. Although phosphate mining is not currently taking place within the Ashley National Forest, past mining has continued right up to the national forest boundary, and similar phosphate deposits occur beneath several areas of the Ashley. There are currently no active phosphate leases on the Ashley National Forest.

Locatable Minerals

Locatable minerals include many kinds of rare high-value minerals such as gold, silver, or copper. Active mining claims are needed for development and extraction of locatable minerals on national forest system lands. As with leasable mineral operations, the Forest Service manages aboveground operations and resources, while the Bureau of Land Management manages the mining claims and belowground operations and resources. As of April 2016, there were 103 active Federal mining claims on the Ashley National Forest covering about 2,128 acres.

Compared to some other national forests, the Ashley contains relatively small and widely scattered locatable mineral deposits. Although many different rock layers and rock ages occur within the Ashley, most of these rock layers are not promising for development of large locatable mineral deposits.

By law, citizens have the right to explore for, claim, and develop locatable mineral deposits on Federal lands, in areas not formally withdrawn (closed to mining claims). Withdrawn areas within the Ashley National Forest include the High Uintas Wilderness (about 274,000 acres on the Ashley portion of the wilderness), the Flaming Gorge National Recreation Area (about 190,600 acres), and numerous smaller areas. Smaller withdrawn areas are generally

associated with reservoirs, canyons where reservoirs were anticipated, and the surface areas above water diversion tunnels.

Active or recent locatable mineral operations on the Ashley National Forest include mining of chemical-grade limestone, mining of decorative calcite blocks, and exploration for gold, silver, copper, and lead. Although there is potential for development of other kinds of locatable minerals (such as gypsum, zeolites, clay, or gemstones), there has been little interest in exploration or development for these resources.

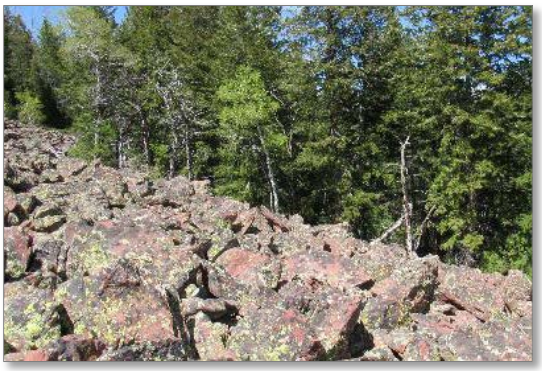
In addition to known mineral resources within the Ashley National Forest, there are also many legends of rich Spanish-era gold mines. There is no valid or reasonable geologic evidence to support such legends. The 1986 forest plan does not address treasure hunting activities, or distinguish them from valid locatable minerals operations.

The 1986 forest plan provides minimal guidance for locatable mineral development. This is because the needed guidance is largely already provided or decided by laws and regulations.

The demands and operations for locatable minerals will likely fluctuate over time. Changes in resource prices, industry demands, discovery of new locatable mineral resources, new uses for known resources, and discovery of new exploration or recovery technology are all factors that influence how much locatable minerals exploration and development could occur on the Ashley National Forest.

Salable Minerals

Salable minerals include sand, gravel, landscaping boulders, and other similar materials on National Forest System lands. Removal of these materials from the national forest does not require mining claims or mineral leases (unlike locatable or leasable minerals). Salable minerals are extracted and used by the Forest Service for maintenance of roads, campgrounds, and other national forest facilities. The Ashley typically uses about 6,500 tons of such minerals for these purposes every year.



Salable rocks on the Ashley National Forest

The Ashley National Forest also provides salable minerals to local governments for public projects, and to the public for small noncommercial uses. We issue about 75 to 120 "free-use" rock permits each year to private citizens for their own personal use. Free use rock permits typically allow removal of 1 to 3 tons of material from the national forest. Use of salable minerals on the Ashley National Forest has been happening for many years, and will likely continue at similar rates into the future.

Abandoned Mines

Abandoned mines are generally mining operations that were abandoned long ago, without being fully or properly cleaned up. Abandoned mine sites may have water quality issues, hazardous materials, or safety and stability issues from mine workings or facilities.

Several small areas of the Ashley National Forest have abandoned mines. Most of these are small hand-dug pits, with no significant concerns or hazards. A few areas have larger pits or underground workings, which could be reclaimed. Such areas are scattered widely across the national forest, and we are working to identify and fix sites with significant concerns.

Conclusions and Future Considerations

The Ashley National Forest is likely to continue managing energy and mineral resources for the foreseeable future, due to the abundance, potential, and demand for such resources. Demand for energy and minerals from the Ashley National Forest is directly related to global demand and market prices for those resources. When demand and market prices for specific resources increase, exploration and development of those resources tends to increase, followed by an increased need for proper management by Forest Service staff.

The constant fluctuation of market prices and demand for various mineral products requires flexibility in both management and staffing. Coordination with other public agencies and industry representatives is also key.

For forest planning, it is important to understand that management of energy and mineral resources is already guided and bounded by applicable laws and regulations, jurisdiction of other Federal or State agencies, and valid existing mineral rights (including non-Federal mineral rights).

As stated previously, the 1997 Western Uintah Basin Oil and Gas Leasing Environmental Impact Statement and Record of Decision amended the forest plan to provide guidance for leasing and development of oil and gas resources within the Ashley National Forest. Until an updated oil and gas leasing analysis for the Ashley is available, that guidance will continue to be followed. For locatable mineral development, the 1986 Ashley forest plan provides minimal guidance because most guidance is already largely decided by laws and regulations. Properly following existing laws and regulations can prevent unacceptable impacts from energy and minerals development.

Additional Information

Herron, David. 2017. Ashley National Forest Assessment, Energy Resources, Mineral Resources, and Geologic Resources and Hazards. Ashley National Forest Supervisor's Office, Vernal UT.
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Geologic Resources and Hazards

The Ashley National Forest includes a variety of both geologic resources and geologic hazards. These include many types and ages of fossils, natural caves and cave-related resources, and areas with scenic or scientifically important rock layers or features. Hazards include landslides, debris flows, earthquakes, and other concerns. Significant fossils, natural caves, and related resources are protected by Federal laws.

The 1986 Ashley Forest Plan was amended by the 1997 Western Uintah Basin Oil and Gas Leasing Decision, which specifically prohibits oil and gas development in areas with steep slopes, unstable soils, or geologic hazards. Otherwise, the 1986 Plan contains little or no guidance specifically for management of geologic resources and hazards.

Current Conditions and Trends of Geologic Resources and Hazards

Fossils

The Ashley National Forest contains a wide diversity of fossils, representing many different ancient creatures, fossil types, and geologic ages. Some of these fossils have significant scientific or educational value. There are abundant Paleozoic-age (pre-dinosaur) aquatic invertebrate fossils (such as shells and corals) and rare Mesozoic-age dinosaur bones and tracks, fish scales, and shark teeth. There are Tertiary-age (post-dinosaur) fish, mammal, crocodile, and turtle fossils, and many well-preserved and scientifically important plant fossils.

Fossil plant leaf

These fossil resources and their locations are protected by law, and site locations are not generally given out, except to qualified scientific researchers. Known fossil sites are managed to protect them from inadvertent damage or illegal collection.

Caves and Cave Resources

The Ashley National Forest includes areas where the local geology tends to create natural caves, sinkholes, large springs, and underground water drainage systems. Geologists and other scientists often refer to such areas, including the related caves and drainage systems, as “karst areas”. Most karst areas are associated with rock layers made of limestone, dolomite, gypsum, or salt, because such rocks tend to be more water-soluble than other kinds of rocks, and commonly develop underground drainages.

There are numerous natural caves and underground drainage systems within the Ashley National Forest. Although caves are often used by the public for recreation, the caves and associated drainage systems often contain or support many other important resources and values. On the Ashley National Forest, caves provide important habitat for several kinds of animals, including bats, rodents, and invertebrates. The underground drainage systems also provide water to important surface springs, which fish and local residents rely on for year-

round flow and temperature conditions. Some caves on the Ashley also contain fossils, sediments, and mineral or ice deposits with significant scientific and educational values. Not all caves have scenic formations, but every cave is unique.

Of the known caves on the Ashley, 41 of them have been designated as Significant Federal Caves, which means they are specifically protected by law from careless or deliberate damage. Only a few of these caves are large, well known to the public, or commonly used for recreation. The other less-known caves are generally small and remote. The names and locations of most caves on the national forest are kept confidential for their protection, and in accordance with Federal cave protection laws and regulations.

Ceiling formations in an area cave

Some caves on the Ashley are gated and closed year-round to protect bats and other sensitive resources, but most are open for public exploration and recreation. Several caves are subject to rapid and potentially lethal flash flooding during spring and early summer, which can be extremely dangerous to unwary visitors.

Special Geologic Areas

The Ashley National Forest has a special management area designated specifically for geology, called the Sheep Creek Geologic Area. There is also a national scenic byway called “Drive through the Ages” with a geology-based theme. The Sheep Creek Geologic Area includes several interesting rock layers, large scenic cliffs, a geologic fault, and a large natural cave that is open in summer for casual recreation and exploration. Drive through the Ages is part of the Flaming Gorge-Uintas National Scenic Byway. It consists of a series of signs along Highway 191, which note the different rock layers crossed by the highway, as it passes over the Uinta Mountains. The rock layers noted span more than 600 million years of geologic history, and represent a wide variety of past geologic environments. Drive through the Ages byway is co-managed by the Ashley National Forest, Utah State Parks, Utah Department of Transportation, and others.

Geologic Hazards

Many types of naturally occurring geologic hazards exist on the Ashley National Forest and can pose a risk to people and infrastructure. Such hazards can include debris flows and landslides, rock-fall, snow avalanches, earthquakes, cave flooding, ground collapse, and dangerous gasses like radon, hydrogen sulfide, or methane. Most geologic hazards on the Ashley National Forest are created by regional geologic conditions, strength of local bedrock units, presence of subsurface voids or hazardous gases, and steep slopes.

There are several rock layers on the Ashley susceptible to landslides and debris flows. These rock layers tend to be poorly drained, not very hard, or were pushed or cut by glaciation into steep slopes. Areas with steep slopes are also susceptible to rock-fall and snow avalanches. Damage from these types of hazards can be minimized by locating people and infrastructure away from steep areas with susceptible rock types.

Damage from a debris flow in 2005

The Ashley National Forest has a moderate hazard risk from local and regional earthquakes. Geologic faults, with potential for creating earthquakes, are widely scattered across the Ashley. Most faults on the national forest are old and inactive, but some are active, and will have significant earthquakes from time to time. Visitors and infrastructure within the Ashley are also at risk from large earthquakes occurring along the Wasatch Fault Zone, near Provo and Salt Lake City.

Some areas of the Ashley National Forest have rock layers susceptible to the creation and collapse of large natural caves. Where possible, infrastructure (like water reservoirs) should be located away from such areas. As mentioned previously, some of the natural caves on the Ashley are also prone to flash flooding during spring runoff or during water releases from reservoirs and can be dangerous to visitors.

Conclusions and Future Considerations

Geologic resources are formed and identified slowly, but can be destroyed quickly and easily. Therefore, management tends to focus on preservation and proper study of known geologic resources, coupled with a deliberate search for additional geologic resources. Geologic hazards can hurt people and destroy important infrastructure, and therefore require careful management. Trends in management of geologic resources and hazards tend to follow local budgets, along with changes in Forest Service staff with interest and expertise in such resources and hazards. Forest Service management of geologic resources also fluctuates over time as limited time and budgets for the geology and minerals programs are diverted to or from other more pressing locatable, leasable, and salable minerals activities and projects. Management of geologic resources also fluctuates with interest and demand by scientific researchers and resource enthusiasts.

The 1986 Ashley forest plan contains little or no guidance specifically dealing with management of geologic resources or geologic hazards. The 1997 Western Uintah Basin Oil and Gas Leasing Record of Decision, which amended the 1986 plan, specifically prohibits oil and gas development in areas with steep slopes, unstable soils, or geologic hazards. Federal laws and agency regulations generally provide little guidance for geologic hazards, beyond using common sense and best practices to avoid or mitigate development within known or suspected geologic hazard zones.

Not all geologic hazards can be mitigated or avoided, but risks and impacts from those hazards can be minimized through improved awareness, and careful engineering and avoidance of known hazards and hazard areas.

Additional Information

Herron, David. 2017. Ashley National Forest Assessment, Energy Resources, Mineral Resources, and Geologic Resources and Hazards. Ashley National Forest Supervisor's Office, Vernal UT.
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Infrastructure

The infrastructure of the Ashley National Forest provides a variety of functions and services to the public, other local and governmental agencies, businesses, Tribes and the Forest Service. These facilities directly affect conditions and uses within the plan area and may support delivery of goods and services in the broader landscape.

Infrastructure on the Ashley consists of:

- roads, bridges, and trails
- dams, canals and pipelines
- water and wastewater systems
- communication towers and energy transmission structures
- gates, cattle guards, and fences
- recreation and special use facilities
- Forest Service administrative facilities

Infrastructure supports and directly affects multiple uses, including recreation, timber, grazing, water uses, minerals and energy, and access to fish, wildlife, and plants. Infrastructure plays a large role in daily Forest Service management and provides support to people and communities outside the national forest.

Roads on the Ashley National Forest provide access to a multitude of national forest uses. Recreationists use roads to access campgrounds, trailheads, boat ramps and Forest Service visitor facilities. Roads not only provide a route to a destination, they also serve as part of the national forest experience as visitors drive the roads to view scenery, hunt, and watch for wildlife. Forest roads also provide access for people with disabilities.

Roads are used to access timber and other forest products, range allotments, utility and communication facilities, and energy and mineral resources. They provide access to dams and irrigation structures, as well as water monitoring sites.

Trails and trailheads are used by recreationists, hunters, stock users, off-highway vehicle riders, mountain bikers, and Forest Service employees. Trails provide access to remote areas of the Ashley not accessible by roads.

Dams, canals, and pipelines provide structure for municipal water, irrigation, and stock water. Some of these structures deliver water from national forest lands to areas outside the national forest boundary. Dams provide deep, yearlong water for fish and streams and prevent winterkill of certain fisheries.

Administrative facilities and buildings used by the Forest Service for management include offices, warehouses and work centers, employee housing, radio towers, roads, gates, and water and wastewater systems.

Energy transmission corridors and communication towers are located on national forest land under the special uses program within the Ashley National Forest, providing locations for companies to provide energy and communication services.

Other facilities include structures that are privately owned, but operated on national forest lands with special use permits. These include resorts, marinas, recreation residences, associated outbuildings, and other facilities. Sites that measure snow and precipitation (called Snotel sites) provide valuable information on the location and quantity of water available on the national forest.

Current Conditions of Ashley National Forest Infrastructure

Infrastructure supports uses both within and outside the national forest boundary. For example, roads managed by other entities lead into the Ashley National Forest to connect with National Forest System roads. Also, the Ashley National Forest contains the watershed that supplies water to the Uinta Basin and Daggett County. Several dams, irrigation systems, marinas and resorts lie within and next to the national forest. These structures are accessed by National Forest System roads and require maintenance and special use permits.

Infrastructure on the Ashley is scattered throughout the national forest. Infrastructure within the wilderness consists of nonmotorized trails and dams. Table 5 shows the numbers of facilities and miles of roads and trails on the Ashley National Forest in each of the four plan areas.

Table 5. Facilities and infrastructure on the Ashley National Forest

Infrastructure	Flaming Gorge	Vernal	Duchesne-Roosevelt North	Duchesne-Roosevelt South	Total
Forest Service Buildings	233	75	94	7	409
Other Buildings[1]	60	91	41	1	193
Dams[2]	8	14	10	0	32
Roads (miles)	462	445	307	258	1,472
Road Bridges[3]	13	14	22	1	50
Trails (miles)	213	358	461	75	1,107
Trail Bridges[4]	10	13	17	0	40
Trailheads	0	4	7	0	11
Wastewater Systems	36	3	19	0	58
Water Systems (in operation)	14	5	11	0	30
Recreation Residence Areas	1	2	1	0	4
Resorts	2	0	2	0	4
Marinas	3	0	0	0	3
Boat Ramps	13	1	2	0	16
Canals	13	12	14	0	39

1. Other Buildings: Recreation residences and out buildings (114), Snotel sites (13), resorts and outbuildings (32), marinas and out buildings (15), communication sites (11), miscellaneous (8)
2. Dams: Bureau of Reclamation (3), special use permit (27), Forest Service (2)
3. Road Bridges: Structures whose condition is reported to Federal Highways Administration
4. Trail Bridges: Longer than 20 feet in length and 5 feet above the ground

Annual and Deferred Maintenance Needs

Much of the infrastructure on the Ashley National Forest is near the end of its lifespan. Our engineering staff uses most of the available funding to maintain existing infrastructure. The following sections describe the current condition of infrastructure as they relate to annual and deferred maintenance.

Roads and Bridges

Identifying Road Needs – In 2009, we completed a comprehensive motorized travel plan for the Ashley National Forest with extensive public involvement. This plan determined the location of routes open to public motorized use, the class of vehicle appropriate for each route, and the timing of use (such as seasonal restrictions). Each route was assigned a system number and was shown on a motor vehicle use map.

There are about 1,472 miles of National Forest System roads on the Ashley National Forest. In 2015, we completed a Travel Analysis Report to identify the minimum road system needed for safe and efficient travel on the national forest and guide future travel management decisions. This report referenced back to the 2009 Motorized Travel Plan and determined which system roads are likely needed and which roads are likely not needed. The report identified 1,461 miles of system road as likely needed—these roads will be analyzed in the future for decommissioning (permanent closure and rehabilitation), for conversion to trails, or to remain as open system roads.

Road Maintenance – We maintain our road system on the Ashley National Forest with funding provided through annual Congressional appropriations, county road agreements, and other funding sources. The majority of maintenance is performed using Congressional appropriations and county road agreements. Currently, 412 miles of road are maintained with county road agreements, which equates to approximately 28 percent of the Ashley National Forest road system. Of the 412 miles under agreement, 329 miles are roads for passenger cars, which is approximately 59 percent of the passenger car system.

The primary components of road maintenance on the Ashley National Forest include blading and shaping; culvert cleaning and drainage improvements; sign maintenance and replacement; and resurfacing (gravel placement, chip seals, and asphalt resurfacing).

Bridges – The Ashley National Forest has 50 road bridges that require inspection on a minimum 2-year cycle per Federal Highway Administration guidelines. The inspection carries an average cost of $460 per bridge. Currently, 7 of the 50 bridges are deficient and need to be replaced. Typical bridge replacement costs for the Ashley National Forest are $250 per square foot of travel way.

Road and Bridge Budgets – Between 2005 and 2015, our annual roads budget decreased from approximately $1.07 million to $706,000—a 34 percent reduction. Approximately 52 percent of the 2015 roads budget was used for overhead costs to manage the road system. Overhead costs cover such items as engineering, maintenance personnel, equipment, administrative services, contract preparation and administration, status or monetary reporting, and input from specialists in hydrology, archeology, wildlife, and recreation. Current funding levels are not sufficient to cover annual maintenance and overhead costs.

Forest Service Buildings

Forest Service buildings on the Ashley National Forest consist of administrative offices and warehouses, bunkhouses, fire support buildings, outbuildings and buildings supporting recreation and communication facilities. Our Facility Master Plan, which is in the process of being revised, provides overall management direction on building design, construction, and maintenance. In general, our buildings are being used efficiently and are located in areas that support current land management needs. We maintain our buildings mostly through

Congressional appropriations, with support from grants and agreements from outside agencies, quarter's collections (rental housing for employees), and recreation fee collections.

Due to steadily declining funding in recent years, we have reduced the number of Forest Service buildings that are too costly to maintain and not critical to operations. We have accomplished this through decommissioning (tearing the building down and removing it from inventory) and the conveyance process (a method of transferring ownership of a building and site to another entity for an equitable value). Since 2010, the Ashley has conveyed 14 buildings at 7 different administrative sites. In 2017, we plan to convey another 10 buildings at 5 sites. These conveyances will have transferred 24 buildings in 6 years. In that same period, we have also decommissioned 25 additional buildings across the national forest.

In total, we have removed 49 buildings in the past 6 years, which has helped us cope with declining budgets. We anticipate that trend to continue but at a slower pace over the next 5 years as we identify more buildings that are too costly to maintain and not critical to operations. As our facilities continue to age and facility maintenance budgets have failed to keep up with maintenance needs, there is a large backlog of maintenance work required to bring buildings up to standard.

Some of our older buildings are potentially eligible or listed in the National Register of Historic Places. This status requires we consider alternative uses before decommissioning and additional funding is needed to repair these buildings and bring them up to standard.

Drinking and Wastewater Systems

We maintain drinking water and wastewater systems at a number of campgrounds and administrative sites across the Ashley National Forest. Funding to maintain these drinking water systems is mostly through Congressional appropriations, with some support from grants and agreements from outside agencies, and recreation fee collections.

In recent years, we have reduced the number of drinking water systems and continue to consider reducing additional drinking water systems, due to declining budgets and lower visitation numbers at certain campgrounds. Also the aging water systems are costly to maintain and replace. Galvanized pipe and fittings are rusting away, distribution and water collection systems fail, or water collection systems are determined to be under the influence of surface water and require additional water treatment and disinfection.

Presently there are 30 drinking water systems and 58 wastewater systems across the Ashley National Forest that are in operation. Each of these drinking water systems is tested monthly during their operational period to ensure that they are meeting State drinking water standards.

Dams

The number of dams on the Ashley National Forest is decreasing. In the last 10 years, 13 wilderness dams have been removed, thus stabilizing the reservoirs to natural lake levels. Three of the six remaining wilderness dams have been reconstructed by special use permittees and one wilderness dam is currently being evaluated for stabilization. We have sole jurisdiction of two dams on the national forest and the rest are under special use authorizations or easements.

Trends Related to Infrastructure

Population Changes – The population growth of Uintah and Duchesne counties from 2010 to 2015 was 16.4 and 12.1 percent, respectively. Because much of the local economy is highly dependent on oil prices, the population changes with the oil market. The population growth of Daggett and Sweetwater Counties was much lower at 4.5 and 1.9 percent, respectively.

Communication Site Infrastructure – The most heavily used communication site on the Ashley National Forest is Grizzly Ridge. This site is currently full and other national forest communications sites are growing. As a result, we have received requests to expand the number of communications sites.

Forest Service Buildings and Water Systems – As stated previously, we have been reducing the number of unneeded buildings through decommissioning and conveyance. The trend is expected to continue due to decreasing budgets and aging infrastructure, but at a slower pace. We are also reducing the number of drinking and wastewater systems due to increased regulations and increasing maintenance costs. The number of water systems on the national forest is trending downward.

Declining budgets are creating management challenges for maintaining many different types of infrastructure on the Ashley National Forest.

Dams – The number of dams on the forest is decreasing. New dams are not being built and many remote high mountain reservoir dams have been stabilized. Plans are in the works to stabilize two high mountain reservoirs. There was a recent proposal to construct new dams on the Ashley, but after some initial field investigative work, the proponent dropped the proposal.

Climate Change – Increased temperatures in the fall and spring could allow roads closed with snowpack to be open sooner in the spring and stay open longer in the fall. Roads in near-stream environments are periodically exposed to high flows. Midwinter flooding is expected to become more common in places where it now occurs and to occur in more locations. Because rain-on-snow driven flood peaks tend to be much higher, flood magnitudes are expected to increase in the rain-on-snow zone as well. Increased peak flow makes infrastructure more vulnerable to effects ranging from minor washouts to complete loss of road prisms.

Roads and Motorized Trails – The public demand for recreation is increasing on the national forest. The number of off-highway vehicles, particularly multi-passenger models, is increasing, and the demand for looped routes to accommodate these types of vehicles is growing.

Very little new road construction occurs on the national forest. Our staff uses all road funding to maintain roads and mitigate safety and resource concerns. This trend is expected to continue. As the road budget decreases, we are reducing the operational maintenance level of some roads to shift funding to the maintenance of more heavily traveled roads.

Our county road agreements with Daggett, Duchesne, Sweetwater, and Uintah Counties help us maintain many of the major roads on the Ashley and bridge the financial gap in appropriated funds for road maintenance. This trend is expected to continue.

User Created Travel Routes – The amount of unauthorized user created routes mainly from motorized use has been increasing. The forest is decommissioning/rehabilitating approximately 15 miles of unauthorized routes each year.

Watershed Improvements that Affect Infrastructure – The Ashley National Forest is the watershed for the Uinta Basin and Daggett County. In 2011, a watershed condition assessment was completed and our staff concentrated work and funding on improving priority watersheds: Cart Creek and Swift Creek. Watershed improvement actions pertaining to infrastructure usually involve reducing sediment from roads, closing unauthorized roads, and dispersing the flow of water under roads in meadows bisected by system roads to enhance meadow connectivity. This has led to positive trends and improvements in these watersheds.

Conclusions and Future Considerations

Current forest plan direction for Ashley National Forest infrastructure is generally still valid. However, with aging infrastructure and continued budget decreases, maintaining roads, administrative buildings, and recreational facilities to a desirable standard has been difficult. The deferred maintenance backlog will continue to increase and this trend is not sustainable. Deferred maintenance is a safety issue for the public and the employees of the Ashley National Forest.

Although there are population fluctuations in Uintah and Duchesne counties because of an economy based on oil production and development, the general trend of visitation and use of the Ashley National Forest is increasing. Ashley National Forest usage is highest during the summer and fall when dispersed recreation and hunting are popular. We have heard from public comments that access to and within national forest lands is a primary concern. Although roads and trails are being maintained, limited budgets have forced us to reduce the maintenance level of some roads so we can better maintain more heavily used roads. We cannot support the Ashley's multiple uses without an adequate road system. Unauthorized user-created routes on the national forest are increasing and causing resource damage—this issue will need management direction.

Additional Information

Mortenson, Valton. 2017. Ashley National Forest Assessment, Infrastructure Report. Ashley National Forest Supervisor's Office, Vernal UT.
https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713

Land Status, Ownership, Access, and Uses

It's clear from the topics discussed in this assessment that we manage the lands of the Ashley National Forest for a multitude of uses and benefits. Yet, it may not be as clear that some of the lands within the national forest boundary are not national forest, and that the status of the lands, and how they are accessed, are constantly changing. This section describes how land status, ownership, use, and access patterns influence the Ashley National Forest and how we manage it.

Land Ownership and Status

When we talk about land ownership and status, we are referring to the patterns of public and private ownership (including ownership of the resources above the ground and below, such as minerals), and the legal uses, permissions, and restrictions of the land. Land ownership and land status includes:

- public domain lands
- private land inholdings
- acquired lands
- lands with reserved or outstanding rights
- existing rights-of-way,
- leased lands
- land withdrawals
- lands in designated areas

Lands managed by the Forest Service are referred to officially as "National Forest System lands." Private land inholdings within the boundaries of the national forest are taken into consideration in the planning process because they influence management of the plan area. In the same respect, management of the forest plan area may influence conditions on the inholdings.

Land status also refers to planning, zoning, easements, or other legal designations for private lands, and formal management status of other public lands (such as national parks, state forests, and local parks).

Land Use and Access

Land use describes how the land is being used. Land use can be residential, commercial, industrial, or agricultural, or it can describe the types of management and uses permitted in existing land management plans for the national forest or other public lands. Desired land uses defined in land use plans for areas outside the national forest may provide important information about how future changes in outside land use may affect management of the forest plan area.

Access is the ability to move to, from, or through the plan area by any means. Although roads and trails seem like obvious ways to access the Ashley National Forest, other means include pedestrian access from properties adjacent to the national forest and the ability to fly into airstrips located within the national forest.

Current Conditions of Lands Within and Around the Ashley National Forest

Land Ownership within the National Forest Boundary

Table 6 shows the acreages for different land ownerships within each planning unit and the total for the Ashley National Forest. There are 22,794 acres of private land inholdings scattered within the Ashley National Forest boundary. Most of these inholdings began as mining claims and homesteads, and the majority are still owned by private individuals. There are 1,720 acres of State trust lands located within the boundary of the Flaming Gorge area, but this is the only area on the Ashley that contains State trust land.

Table 6. Acres of land classified by ownership within the Ashley National Forest plan area

Area	National Forest System	Private	State
Flaming Gorge	353,928	10,695	1,720
Vernal	341,218	7,428	0
Duchesne-Roosevelt North	500,779	2,295	0
Duchesne-Roosevelt South	204,357	656	0
Ashley National Forest (Totals)	1,400,282	22,794	1,720

Lands Next to the National Forest

Lands next to and near the Ashley National Forest can be affected by national forest management—conversely, what happens on those other lands can affect the national forest itself. Therefore, it's important that we look beyond the national forest boundary as we assess lands and uses. Federal lands outside the Ashley include the Uinta Wasatch-Cache National Forest and lands managed by the Bureau of Land Management. Other lands include the Uintah and Ouray Indian Reservation, Utah and Wyoming State lands, and the counties surrounding the national forest (see figure 11, next page).

Land Additions, Subtractions, and Exchanges

Conveyances

As noted in the "Infrastructure" section, we have reduced the number of Forest Service facilities over time through conveyances (sale or exchange). Some of these facilities included the land as well. Between 2010 and 2015, we conveyed three administrative sites, three dwellings, a ranger station, and a landfill (all totaling about 17 acres) to reduce the backlog and cost of maintaining the facilities. All but one of these sites were located outside of the plan area and most were administrative buildings located in nearby towns and communities. Additional administrative sites are currently being worked on for conveyance.

Land Purchases

There have been no land purchases or donations on the Ashley National Forest in the last 30 years. The primary funding source for land acquisitions in the past 50 years has been the Land and Water Conservation Fund; however, the program expired in 2015 and was only renewed for 3 more years. Whether it will be renewed again is uncertain.

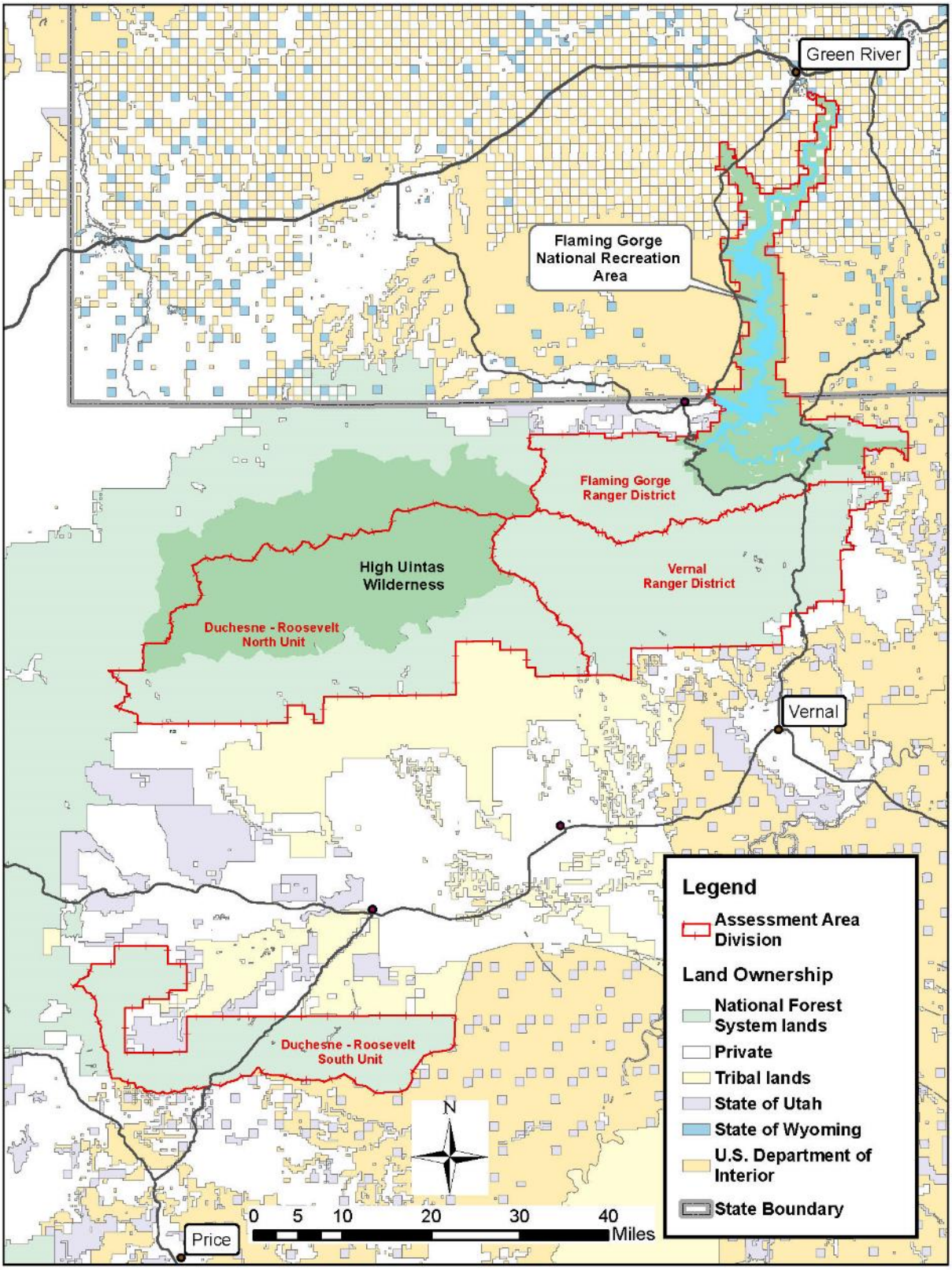


Figure 11. Land ownership in and around the Ashley National Forest

Land Exchanges

Land exchanges on the Ashley National Forest have occurred three times since the current forest plan was written:

- In 1990, the Ashley National Forest received administrative jurisdiction over 315 acres of Federal land from the Department of Interior as mitigation for wildlife concerns associated with the Central Utah Project, a Federal water project for the development of water supplies.
- In 1998, the Ashley received title to 333 acres of surface estate (ownership of the surface only) from the State of Utah, within the Flaming Gorge National Recreation Area and 7,150 acres of mineral estate (ownership of the mineral rights only) in various parts of the national forest. These were acquired as part of the Utah Schools and Lands Exchange Act.
- In 1999, approximately 2,433 acres of national forest land in and around the community of Dutch John were transferred to the Department of Interior for eventual sale into private ownership.

No major land exchange proposals have occurred since 1999. Minor land exchanges are likely to occur more frequently and new proposals are evaluated on a case-by-case basis. However, due to the lengthy and costly process of conducting land exchanges, the number of proposals that can be processed is limited.

Utility Corridors

The utility corridor management emphasis areas in the current forest plan are generally consistent with the current needs identified by the Western Utility Group, an organization of major western gas, electric, and telecommunications companies. The current forest plan direction identifies energy transportation and utility corridor/window designations; it also identifies areas of exclusion (such as the national recreation area) that have a statutory prohibition to rights-of-way for linear facilities or corridor/window designations.

Recent increased activity in large transmission projects across the western states show, along with increased interest in communication uses and technologies, the demand for better connectivity is on the rise and is expected to increase. Although there have been three proposals for large transmission projects needing right-of-way corridors that have been proposed in the area, two have resulted in not crossing Ashley National Forest lands, and the third project has yet to determine their routes.

Rights-of-Way and Easements

Rights-of way are legal rights provided by the Forest Service to another party to pass along a specific route through national forest land (like a transmission line passing through a national forest). Easements are permissions the Forest Service grants to another party to use national forest land for a specified purpose (like a private landowner needing to build a road across national forest land to get to their property).

Powerline corridors pass though national forests on permitted rights-of-way

There are about 20 road rights-of-way and easements on the Ashley National Forest that provide public access to the Ashley National Forest through adjoining private, Tribal and Bureau of Land Management lands. Although there has been little activity to identify new rights-of way and easements, we anticipate a need for other public access routes in the future. Establishing new rights-of-way and easements will depend greatly on the cooperation of adjacent landowners where these routes and corridors may occur.

Communications Sites

There are five communication sites on the Ashley National Forest. The sites provide service to the public through leases to companies, State agencies, and others for communication facilities. Inquiries concerning new uses on existing sites are increasing. The Ashley currently has limited ability to accommodate additional uses at existing sites due to limited capacity. As cellular technology continues to develop, the need for additional or expanded facilities is likely. Communication site plans are essential to the planning and management of a site, yet only one of the five sites has a management plan in place.

Communication site atop a ridge in the Ashley National Forest

Boundary Surveys

Intermountain Region survey crews perform boundary line surveys annually at different locations around the national forest. Much of the boundary line needs refurbishment, and in some cases, needs to be resurveyed. Additional boundary line surveys are needed in the next decade and should include any inholding land that has not yet been surveyed and marked. Continued development adjacent to the forest boundary will require periodic maintenance of posted boundary markers and surveys to identify encroachments and trespasses. There are currently eight encroachment cases documented on the Ashley National Forest in the Title Claims and Encroachments Management System database.

Mineral Withdrawals

A mineral withdrawal removes specific areas of the national forest from prospecting and mining activities and can only occur through an act of Congress or an extensive public process initiated by the Secretary of the Interior (the department that oversees all minerals management on Federal lands).

Since approval of the forest plan in 1986, six withdrawals have been revoked, and one partially revoked on the Ashley National Forest. Roughly 12,000 acres remain withdrawn from mineral exploration and development for a variety of purposes. There are currently no withdrawal requests pending and none is anticipated in the future.

Special Uses

Recreation special use authorizations include recreation residences, resorts, marinas, outfitter and guide services, and temporary events. Requests for and interest in recreation

special use authorizations is increasing and expected to continue. This increase is primarily for temporary events such as fishing derbies.

Our staff processes and administers lands special use authorizations for a variety of purposes. These uses range from roads, powerlines, canals, and water pipelines to small dams and reservoirs. Requests for and interest in these types of authorizations are increasing primarily for utilities such as power, oil and gas, fiber optic lines, and cellular infrastructure. To date, we have not received any requests for authorizations in relation to renewable energy for wind or solar power, but some interest has been shown in the development of hydropower projects.

There are currently 125 recreation special use authorizations on the Ashley National Forest. Most are in the Flaming Gorge and Vernal Ranger Districts (59 and 46, respectively), fewer are in the Roosevelt-Duchesne North unit (20), and there are none in the Duchesne South unit. Recreation special uses include:

- Recreation residences
- Privately owned resorts
- Privately owned marinas
- Government owned concessions
- Rental services
- Outfitter and guide services
- Temporary events

There are currently 146 land special use authorizations on the Ashley National Forest. Most of these uses occur on the Flaming Gorge Ranger District (65), followed by Roosevelt-Duchesne North (45), Vernal (29), and Duchesne South (7). Land special uses are more diverse. They include uses such as:

- Agricultural and agricultural improvements
- Arts (filming and photography)
- Communications infrastructure
- Cultural resource
- Dams and reservoirs
- Electric transmission and distribution
- Energy generation and transmission
- Federal highway right-of-way
- Oil and gas development
- Precipitation and seismic measuring stations
- Research
- Roads and trails
- Storage
- Telephone and fiber optic lines
- Water gauging stations
- Water transport (canals, ditches, and pipelines)

National Forest Access

Visitor Access

The Ashley National Forest is accessed by a number of primary and secondary roads. These roads include Utah and Wyoming State highways, as well as numerous county roads, Tribal roads, and National Forest System roads. Highway 191 and State Highway 44 are designated scenic byways, running through the Vernal and Flaming Gorge Ranger Districts. The roads provide access to several national forest roads and trails and are the main access to the national recreation area. National Forest System roads and a scenic backway provide access to the north slope of the Uinta Mountains. A scenic backway, county roads, and Tribal roads provide access to the many canyons along the south slope of the Uinta

Mountains within the Vernal and Duchesne-Roosevelt Ranger Districts. The Duchesne South unit can be accessed from Highway 191, which is a scenic byway, or from Reservation Ridge (a scenic backway), or a number of National Forest System, Tribal, or county roads. More in depth information on the Ashley's scenic byways and backways can be found in the "Recreation" section.

As stated in the Infrastructure section, we published a motorized travel plan in 2009 and a travel analysis report in 2015. The motorized travel plan will be incorporated into the revised forest plan and will not be readdressed in the revision process.

Access for Oil and Gas Development

A portion of the Duchesne-Roosevelt South Unit is currently under lease for oil and gas development and production as authorized by a Forest Service leasing decision in 1997. Some lease development occurred prior to 2012, including construction of well pads and new access roads. A programmatic development environmental impact statement and record of decision were released in 2012, for development of oil and gas leases controlled by Berry Petroleum. This 2012 decision allows for construction of up to 57 miles of new access roads, and the use and upgrade of 20 miles of existing forest system roads, in addition to various other developments. The new access roads are specifically for oil and gas development, and are not open for public use. Some of these access roads have been constructed, but construction of new access roads is currently on hold due to low prices for crude oil. Development of additional access roads might occur if oil prices increased in the future.

Sharing Access with Others

As stated previously, the Ashley National Forest boundary adjoins with a variety of other land ownerships, which provides opportunities for shared maintenance and access into and out of the national forest. As access into the national forest increases, collaborating with other landowners and managers will be essential.

Conclusions and Future Considerations

Current forest plan direction for Ashley National Forest lands, access, and special uses is still valid as it relates to land exchanges, purchases, and conveyances; surveys; rights-of-way, easements, and corridors; access; and special uses.

Our shared boundary with other Federal, State, Tribal, and local landowners provides us with opportunities, as well as challenges, to collaborate on land use and access. We determined where motorized travel will occur on the Ashley National Forest in the 2009 motorized travel plan, and that decision will become part of the revised forest plan. The Travel Analysis Report, completed in 2015, will also help guide future management decisions for roads across the Ashley.

When the forest plan was written 30 years ago, there were no cell phones or internet services. Demands for facilities to support these types of communications are increasing across the Ashley.

When the forest plan was written, communication services were not what they are today. There were no cellular phones, or internet services. Today there is an increased demand for

local communication uses, including small communities needing more connectivity and better quality service. This will likely increase the demand for more communication facilities and possibly more utility corridors for power and fiber optic infrastructure across the national forest. Current forest plan direction states that future energy transmission corridors will be in conformance with the Corridor Plan (Appendix H) of the forest plan environmental impact statement. Recent increased activity in large transmission projects across the western states show the possibility of increased interest and need.

With declining budgets to maintain certain lands and facilities, our staff will continue to look for opportunities to convey out unneeded administrative properties to reduce the backlog of building maintenance, and pursue land exchange, purchase, and donation proposals when in the public interest.

Additional Information

Reese, Gina. 2017. Ashley National Forest Assessment, Land Ownership and Status, Use, and Access Report. Ashley National Forest Supervisor's Office, Vernal UT. https://www.fs.usda.gov/detail/ashley/landmanagement/planning/?cid=fseprd547713