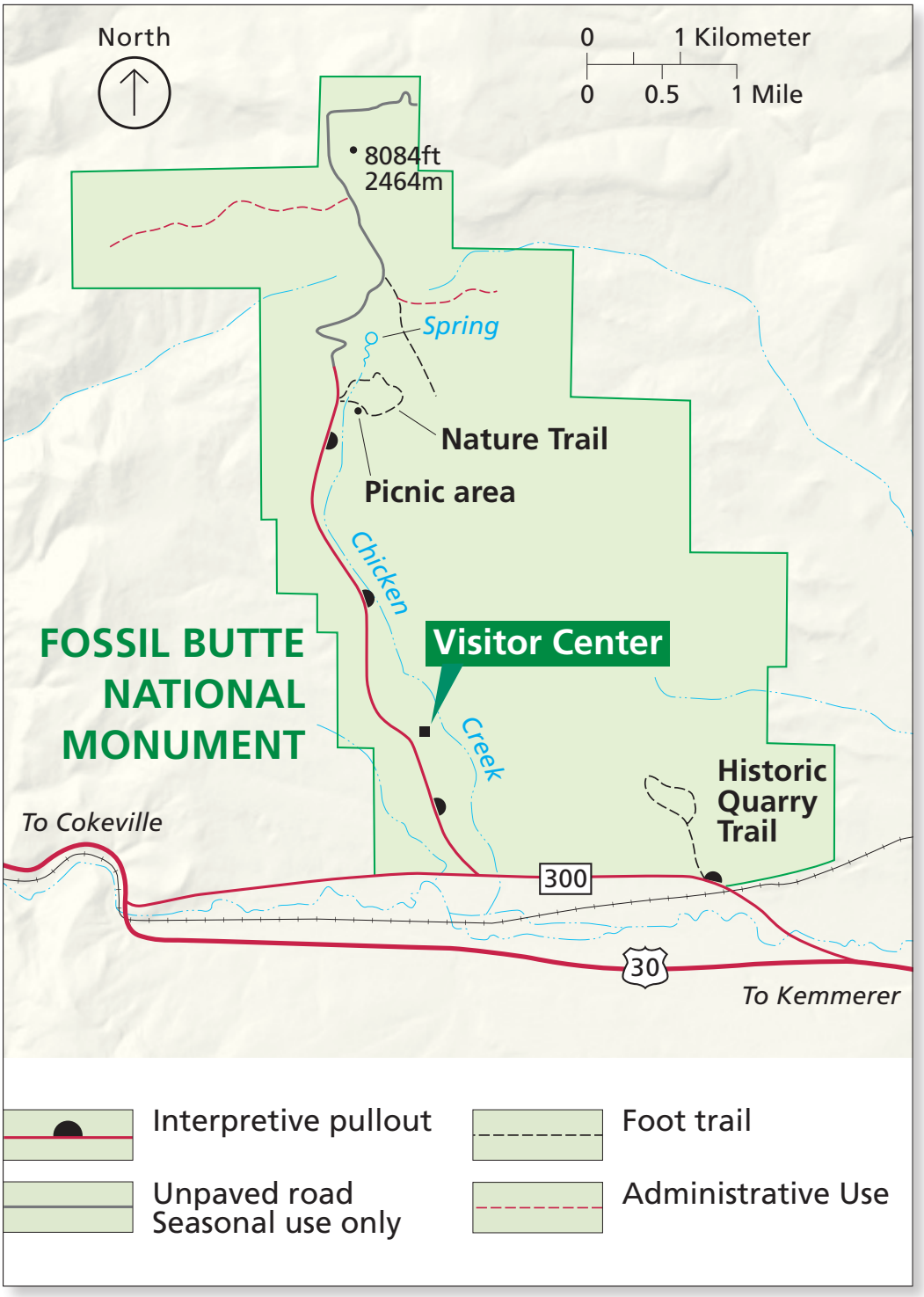
NATIONAL PARK SERVICE • U.S. DEPARTMENT OF THE INTERIOR

Foundation Document

Fossil Butte National Monument

Wyoming

March 2017


North
0
1 Kilometer
0
0.5
1 Mile
8084ft
2464m
Spring
Nature Trail
Picnic area
Chicken
Creek
FOSSIL BUTTE
NATIONAL
MONUMENT
Visitor Center
Historic
Quarry
Trail
To Cokeville
300
30
To Kemmerer
Interpretive pullout
Foot trail
Unpaved road
Seasonal use only
Administrative Use

Contents

Mission of the National Park Service

The National Park Service (NPS) preserves unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations. The National Park Service cooperates with partners to extend the benefits of natural and cultural resource conservation and outdoor recreation throughout this country and the world.

The NPS core values are a framework in which the National Park Service accomplishes its mission. They express the manner in which, both individually and collectively, the National Park Service pursues its mission. The NPS core values are:

- **Shared stewardship:** We share a commitment to resource stewardship with the global preservation community.
- **Excellence:** We strive continually to learn and improve so that we may achieve the highest ideals of public service.
- **Integrity:** We deal honestly and fairly with the public and one another.
- **Tradition:** We are proud of it; we learn from it; we are not bound by it.
- **Respect:** We embrace each other's differences so that we may enrich the well-being of everyone.

The National Park Service is a bureau within the Department of the Interior. While numerous national park system units were created prior to 1916, it was not until August 25, 1916, that President Woodrow Wilson signed the National Park Service Organic Act formally establishing the National Park Service.

The national park system continues to grow and comprises more than 400 park units covering more than 84 million acres in every state, the District of Columbia, American Samoa, Guam, Puerto Rico, and the Virgin Islands. These units include, but are not limited to, national parks, monuments, battlefields, military parks, historical parks, historic sites, lakeshores, seashores, recreation areas, scenic rivers and trails, and the White House. The variety and diversity of park units throughout the nation require a strong commitment to resource stewardship and management to ensure both the protection and enjoyment of these resources for future generations.

The arrowhead was authorized as the official National Park Service emblem by the Secretary of the Interior on July 20, 1951. The sequoia tree and bison represent vegetation and wildlife, the mountains and water represent scenic and recreational values, and the arrowhead represents historical and archeological values.

Introduction

Every unit of the national park system will have a foundational document to provide basic guidance for planning and management decisions—a foundation for planning and management. The core components of a foundation document include a brief description of the park as well as the park's purpose, significance, fundamental resources and values, other important resources and values, and interpretive themes. The foundation document also includes special mandates and administrative commitments, an assessment of planning and data needs that identifies planning issues, planning products to be developed, and the associated studies and data required for park planning. Along with the core components, the assessment provides a focus for park planning activities and establishes a baseline from which planning documents are developed.

A primary benefit of developing a foundation document is the opportunity to integrate and coordinate all kinds and levels of planning from a single, shared understanding of what is most important about the park. The process of developing a foundation document begins with gathering and integrating information about the park. Next, this information is refined and focused to determine what the most important attributes of the park are. The process of preparing a foundation document aids park managers, staff, and the public in identifying and clearly stating in one document the essential information that is necessary for park management to consider when determining future planning efforts, outlining key planning issues, and protecting resources and values that are integral to park purpose and identity.

While not included in this document, a park atlas is also part of a foundation project. The atlas is a series of maps compiled from available geographic information system (GIS) data on natural and cultural resources, visitor use patterns, facilities, and other topics. It serves as a GIS-based support tool for planning and park operations. The atlas is published as a (hard copy) paper product and as geospatial data for use in a web mapping environment. The park atlas for Fossil Butte National Monument can be accessed online at: http://insideparkatlas.nps.gov/.

Part 1: Core Components

The core components of a foundation document include a brief description of the park, park purpose, significance statements, fundamental resources and values, other important resources and values, and interpretive themes. These components are core because they typically do not change over time. Core components are expected to be used in future planning and management efforts.

Brief Description of the Park

Fossil Butte National Monument is near Kemmerer, Wyoming, north of Interstate 80 on U.S. Highway 30. The monument is a day-use area; overnight accommodations are available in Kemmerer and Diamondville and camping is allowed on adjoining Bureau of Land Management (BLM) public lands. National monument facilities include the visitor center, two self-guided interpretive hiking trails, a picnic area, maintenance building, seasonal housing duplex, and a 7.5-mile scenic drive. Many visitors stop at the national monument en route to Dinosaur National Monument, Yellowstone National Park, or Grand Teton National Park.

Fossil Butte National Monument presents a window into life in southwestern Wyoming 52 million years ago during the Eocene Epoch. Today's high-desert environment of the monument is a stark contrast to the warm-temperate lake environment of the past. Fossil Lake, Lake Gosiute, and Lake Uinta interconnected to form a lake system now referred to as the Green River Lake System. The lakes were located in what are now the states of Wyoming, Utah, and Colorado. The maximum size of ancient Fossil Lake was about 50 miles long (north/south) and 30 miles wide (east/west). During its approximately 2 million year life, its length and width varied considerably.

Today, the national monument protects small portions of ancient Fossil Lake sediments. The monument consists of 13 square miles (8,198 acres) of the 1,500-square-mile (960,000 acre) area covered by ancient Fossil Lake. Scientists refer to the lake sediments, now rocks, as the Green River Formation. These rocks preserve a tremendous variety of fossils. In addition to the Green River Formation, the Wasatch Formation, composed of river and stream sediments, is exposed in the monument. The Wasatch Formation contains fossilized teeth and bone fragments of many Eocene bird, reptile, fish, and mammal species, including early primates and horses. These fossils indicate which animals lived near Fossil Lake, adding the shoreline environment to Fossil Lake's story.

The fossil record preserved within the Eocene Green River Formation of Fossil Basin is world renowned. More than 125 years of continuous collecting has revealed a wide diversity of fossil fish, reptiles, birds, crustaceans, amphibians, mollusks, mammals, insects, and plants. Discoveries of new fossil species from the ancient lake sediments continue to expand understanding of the paleoecosystem. Most notably, the extraordinary quality of fossil preservation is almost unparalleled in the fossil record. The quiet-water conditions, water chemistry, fine-grained lake sediments, and absence of scavengers combine to preserve articulated skeletons (all bones are in place rather than scattered). The delicate bones of rarely preserved fish, birds, and bats yield valuable scientific data.

Fossils from Fossil Lake are found in museums around the world. Active commercial fossil collecting in private quarries around the national monument yields tens of thousands to hundreds of thousands of fossil fish each year. Fossil Butte National Monument's strong relationship with several of the quarries helps the monument stay informed of new discoveries and scientific advancements in paleontology. The fossil fish found in the quarries near the national monument represent the most abundant articulated fossil vertebrates in the world.

Park Purpose

The purpose statement identifies the specific reason(s) for establishment of a particular park. The purpose statement for Fossil Butte National Monument was drafted through a careful analysis of its enabling legislation and the legislative history that influenced its development. The monument was established when the enabling legislation adopted by Congress was signed into law on October 23, 1972 (see appendix A for enabling legislation). The purpose statement lays the foundation for understanding what is most important about the park.

The purpose of Fossil Butte National Monument is to preserve a portion of Eocene Fossil Lake deposits, which contain abundant and exceptionally well-preserved fossils, promote stewardship of the greater Green River Formation, and through exhibits and programs, increase public understanding of their significance.

Park Significance

Significance statements express why a park unit's resources and values are important enough to merit designation as a unit of the national park system. These statements are linked to the purpose of Fossil Butte National Monument, and are supported by data, research, and consensus. Statements of significance describe the distinctive nature of the park and why an area is important within a global, national, regional, and systemwide context. They focus on the most important resources and values that will assist in park planning and management.

The following significance statements have been identified for Fossil Butte National Monument. (Please note that the sequence of the statements does not reflect the level of significance.)

1. The extraordinary quality of fossil preservation within the Green River Formation at Fossil Butte National Monument is almost unparalleled in the fossil record. The unusual conditions of the ancient lake preserved complete skeletons of delicate and rarely preserved fish, birds, and bats. Fossil Lake sediments yield valuable scientific data such as the Earth's only articulated freshwater stingrays, oldest articulated bats, and complete life cycles of fishes.

2. The Fossil Lake deposit contains more fossilized fishes than any other deposit on Earth.

3. The Fossil Lake deposits and the Greater Green River Formation contain one of the world's most diverse Eocene assemblages of fossilized animals and plants, including the world's most diverse bird fauna, illustrating an almost complete picture of the ancient aquatic and much of the terrestrial ecosystems.

4. Fossil Butte National Monument exhibits the greatest number of Green River fossils in the world, and provides a dynamic scientific interpretation of their geological, paleontological, and historical significance.

5. Scientific and commercial collecting of fossils has occurred in Fossil Basin since the 1850s. The understanding of paleontology and geology of the Green River Formation has grown through the efforts of and in collaboration with scientists and partnerships with quarries on private and Wyoming state lands.

6. Fossil Butte National Monument contains part of the widespread Green River Formation, which is Earth's best-preserved warm-temperate Eocene lake system. This provides opportunities for research and understanding into the geologic processes that created the ideal conditions for preserving fossils.

Fundamental Resources and Values

Fundamental resources and values (FRVs) are those features, systems, processes, experiences, stories, scenes, sounds, smells, or other attributes determined to warrant primary consideration during planning and management processes because they are essential to achieving the purpose of the park and maintaining its significance. Fundamental resources and values are closely related to a park unit's legislative purpose and are more specific than significance statements.

Fundamental resources and values help focus planning and management efforts on what is truly significant about the park. One of the most important responsibilities of NPS managers is to ensure the conservation and public enjoyment of those qualities that are essential (fundamental) to achieving the purpose of the park and maintaining its significance. If fundamental resources and values are allowed to deteriorate, the park purpose and/or significance could be jeopardized.

The following fundamental resources and values have been identified for Fossil Butte National Monument:

- **Fossil Lake Deposits of the Green River Formation within the Monument.** The Fossil Lake deposit within the monument contains many fossil bearing zones, five of which are commercially produced outside the monument in private quarries. The fossil_bearing rocks are composed of very fine grained lime muds interbedded with paper-thin kerogen layers that are noted for preserving a variety of complete and detailed fossils spanning a 2 million year period. The monument's collections contain representations of the more common fossils and a few rarer species.
- **Museum Collections and Fossil Preservation.** The monument maintains a museum collection of fossils and other significant monument resources for visitor display, scientific study, and historic record. The monument records fossils from surrounding quarries through pictures and/or casts to augment the monument collection and scientific data. The monument preserves fossils in situ and in its museum collection.

- **Exhibits.** Fossil Butte National Monument creates, updates, and maintains exhibits on site to assist visitors in understanding the significance and uniqueness of the monument's resources. Although many of the most significant specimens are always on exhibit in the visitor center, others are frequently rotated with items in the museum collection.
- **Fossil Quarriers and Geological/Paleontological Research Institutions.** The monument is committed to telling the story of historic and current quarrying in the area and to the continuation of geologic and paleontologic research. The monument assists with ongoing research activities and interprets results and new discoveries to the public and commercial quarries.
- **Programs, Education, and Public Outreach.** The monument is one of the only places that provide programs to engage the public in the geology and paleontology of the Green River Formation. The monument continues to educate universities and research institutions, as well as school children and the general public, through on-site and classroom programs. The monument provides public outreach locally, regionally, and nationally.

Other Important Resources and Values

Fossil Butte National Monument contains other resources and values that are not fundamental to the purpose of the park and may be unrelated to its significance, but are important to consider in planning processes. These are referred to as "other important resources and values" (OIRV). These resources and values have been selected because they are important in the operation and management of the park and warrant special consideration in park planning.

The following other important resources and values have been identified for Fossil Butte National Monument:

- **Natural Resources.** These resources include regionally unique vegetation, wildlife, and water resources.
- **Scenic Values.** The scenic values of Fossil Butte National Monument include both the views within the monument as well as the view from the monument out to the surrounding landscape. The monument also provides an opportunity for solitude and dark skies.

Interpretive Themes

Interpretive themes are often described as the key stories or concepts that visitors should understand after visiting a park—they define the most important ideas or concepts communicated to visitors about a park unit. Themes are derived from, and should reflect, park purpose, significance, resources, and values. The set of interpretive themes is complete when it provides the structure necessary for park staff to develop opportunities for visitors to explore and relate to all park significance statements and fundamental and other important resources and values.

Interpretive themes are an organizational tool that reveal and clarify meaning, concepts, contexts, and values represented by park resources. Sound themes are accurate and reflect current scholarship and science. They encourage exploration of the context in which events or natural processes occurred and the effects of those events and processes. Interpretive themes go beyond a mere description of the event or process to foster multiple opportunities to experience and consider the park and its resources. These themes help explain why a park story is relevant to people who may otherwise be unaware of connections they have to an event, time, or place associated with the park.

The following interpretive themes have been identified for Fossil Butte National Monument:

- Fossil Butte National Monument provides an opportunity to study the abundant, diverse, and exquisitely preserved fossil specimens of Fossil Lake and the well-preserved rock record of the basin itself, enabling understanding and appreciation of the wide variety of plants and animals that inhabited this system of lake and terrestrial environments during the early Eocene Epoch.
- Fossils have garnered the interest of commercial and scientific collectors since their discovery in the 1850s in Fossil Basin. Fossil Butte National Monument provides a forum to discuss fossil collecting and the role of public–private partnerships in advancing paleontology.
- Climate change is evident when comparing the fossil evidence of a warm-temperate environment to the semi-arid sagebrush steppe ecosystem of Fossil Butte National Monument today. Studying these fossils reveals how climate and life are intrinsically linked and continually changing, helping us better understand changes through time and explore how climate change continues to alter the landscape.
- Fossil Butte National Monument provides an increasingly rare opportunity to experience solitude, scenic views, and dark night skies.

Part 2: Dynamic Components

The dynamic components of a foundation document include special mandates and administrative commitments and an assessment of planning and data needs. These components are dynamic because they will change over time. New special mandates can be established and new administrative commitments made. As conditions and trends of fundamental and other important resources and values change over time, the analysis of planning and data needs will need to be revisited and revised, along with key issues. Therefore, this part of the foundation document will be updated accordingly.

Special Mandates and Administrative Commitments

Many management decisions for a park unit are directed or influenced by special mandates and administrative commitments with other federal agencies, state and local governments, utility companies, partnering organizations, and other entities. Special mandates are requirements specific to a park that must be fulfilled. Mandates can be expressed in enabling legislation, in separate legislation following the establishment of the park, or through a judicial process. They may expand on park purpose or introduce elements unrelated to the purpose of the park. Administrative commitments are, in general, agreements that have been reached through formal, documented processes, often through memorandums of agreement. Examples include easements, rights-of-way, arrangements for emergency service responses, etc. Special mandates and administrative commitments can support, in many cases, a network of partnerships that help fulfill the objectives of the park and facilitate working relationships with other organizations. They are an essential component of managing and planning for Fossil Butte National Monument.

Special Mandates

- **Public Law 92-537, section 1 (October 23, 1972).** The legislation establishing Fossil Butte National Monument stated, "...except that at no time shall the boundaries encompass more than eight thousand two hundred acres." In accordance with this section, the Secretary of the Interior has completed acquisition of lands resulting in a total acreage of 8,198 acres. Fossil Butte National Monument has proprietary jurisdiction.
- **Public Law 92-537, section 4(a) (October 23, 1972).** The legislation establishing Fossil Butte National Monument stated, "...That the use of lands within the monument for stock driveways shall continue in perpetuity at such places where this use will not conflict with administration of the monument (section 4(a) S.141).
- **Public Law 81-787, 64 Stat. 849, section 1 (54 USC 104907) (September 14, 1950).** The legislation that established Grand Teton National Park stated, "...That no further extension or establishment of national parks or monuments in Wyoming may be undertaken except by express authorization of the Congress." Fossil Butte National Monument is able to enlarge its boundary through an act of Congress.

For more information about the existing administrative commitments for Fossil Butte National Monument, please see appendix B.

Assessment of Planning and Data Needs

Once the core components of part 1 of the foundation document have been identified, it is important to gather and evaluate existing information about the monument's fundamental and other important resources and values, and develop a full assessment of the monument's planning and data needs. The assessment of planning and data needs section presents planning issues, the planning projects that will address these issues, and the associated information requirements for planning, such as resource inventories and data collection, including GIS data.

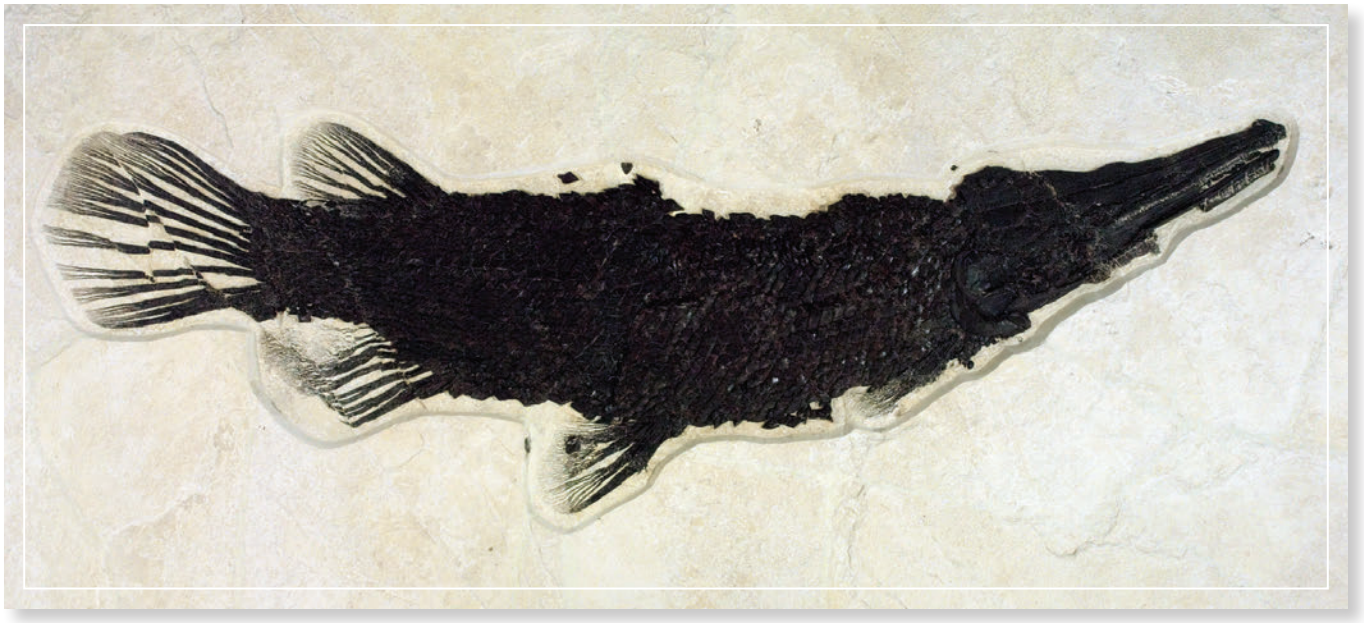
There are three sections in the assessment of planning and data needs:

1. analysis of fundamental and other important resources and values
2. identification of key issues and associated planning and data needs
3. identification of planning and data needs (including spatial mapping activities or GIS maps)

The analysis of fundamental and other important resources and values and identification of key issues leads up to and supports the identification of planning and data collection needs.

Analysis of Fundamental Resources and Values

The fundamental resource or value analysis table includes current conditions, potential threats and opportunities, planning and data needs, and selected laws and NPS policies related to management of the identified resource or value.



Fundamental Resource or Value	Fossil Lake Deposits of the Green River Formation within the Monument
Related Significance Statements	All significance statements
Current Conditions and Trends	**Conditions** • Cliffs are stable for the most part, although the underlying Wasatch Formation (made of mudstone) slumps when saturated with water and will carry overlying Green River Formation with it. • The monument monitors blocks of rock that occasionally slough off cliffs for fossil resources. • The current research quarry is nearly worked out of the rock; when it is complete the monument will begin to quarry an adjacent section. **Trends** • Deposits are in stable condition with intermittent natural events that (permanently) damage the resources.
Threats and Opportunities	**Threats** • There are occasional attempts to steal fossils from the field. • Geologic events such as earthquakes or the slumping of the Wasatch Formation could impact the integrity of the overlying Green River Formation. • There is a limited quantity of Fossil Lake resources contained within the monument, limiting the scientific information and research that can be conducted strictly within monument boundaries. • Increase in large storms, flooding, and erosion due to climate change may impact the formations. **Opportunities** • Interpret the type section of the Fossil Butte Member, one of three formally described rock units of the Green River Formation in Fossil Basin and the only one within the monument's boundaries. • Facilitate and encourage research on lands around the monument and establish criteria for which geologic research proposals will be accepted within the monument. • Evaluate rockfalls and slumps containing Green River Formation rock to determine if there are fossils of scientific or exhibit value that should be collected.

Fundamental Resource or Value	Fossil Lake Deposits of the Green River Formation within the Monument
Existing Data and Plans Related to the FRV	• Geologic map. • Paul Buchheim 1981 report "Paleoenvironments and paleoecology of the Green River Formation in Fossil Basin (Fossil Butte National Monument), Wyoming." • Natural resource condition assessment. • NPS Geologic Resources Inventory geologic map, Stephanie O'Meara, Colorado State University, 2007. • Digital "Geologic Map of Fossil Butte National Monument and Vicinity, Wyoming."
Data and/or GIS Needs	• Drill rock cores across Fossil Basin for use in scientific studies and for exhibit. • Monitoring and modeling of climate change stressors. • Paleontological research priority list.
Planning Needs	• Resource stewardship strategy. • Climate change scenario planning.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Paleontological Resources Preservation Act of 2009 • Museum Properties Management Act of 1955, as amended • Federal Land Policy and Management Act of 1976 • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§4.8.1) "Protection of Geologic Processes" • NPS *Management Policies 2006* (§4.8.2) "Management of Geologic Features" • NPS *Management Policies 2006* (§4.8.2.1) "Paleontological Resources and Their Contexts" • NPS *Natural Resource Management Reference Manual 77* • Director's Order 24: *NPS Museum Collections Management* • Director's Policy Memorandum 12-02, "Applying National Park Service Management Policies in the Context of Climate Change"

Fundamental Resource or Value	Museum Collections and Fossil Preservation
Related Significance Statements	Significance statement 4
Current Conditions and Trends	**Conditions** • There are currently three rooms that contain museum specimens in cabinets. Each has an adequate environment for preserving rocks and fossils, although there is a need for a sprinkler system. Additional collections are stored in facilities not originally intended as museum space, such as occupied monument housing. • The monument is expanding into additional space to house museum collections due to increasing collection size. • All monument collections, except small groups on loan for exhibit, are housed at the monument so that they are available for exhibition or scientific research in the visitor center. • Some fossils are in very good exhibit quality, whereas others are unprepared, e.g., still embedded in rock, only partially visible, unstabilized. • Specimens are rotated through exhibit spaces as staff time allows. • Many fossils and casts are donated to the monument, primarily by private fossil quarry operators in the basin. • The monument has an air abrasion machine for fossil preparation and an additional machine on order that will improve ability to use newly available iron powder for higher quality fossil preparation. **Trends** • The monument has increased the amount of contracting for fossil preparation as expertise and time are not always available in-house. • The monument has received an increased number of unprepared fossils requiring expert preparation (one or two a year). • The on-site quarry continues to produce fossils, which contributes to the growth of the collection.

Fundamental Resource or Value	Museum Collections and Fossil Preservation
Threats and Opportunities	**Threats** • Inability to visit facilities that have borrowed specimens to verify that they are being cared for properly. • The lack of a sprinkler system in some collection storage spaces puts certain items at risk of fire damage. • There is a risk of damage to specimens while moving them between facilities for routine museum work or for other reasons, such as exhibit rotation. • The monument is running out of available storage space, which will at some point limit its ability to acquire specimens for exhibit and further scientific research. • Collections housed in certain monument facilities (such as monument housing) have threats related to the use of culinary water systems and increased fire hazard from other uses in adjacent rooms. • The monument is in an earthquake zone; an earthquake has had minor impact on museum collections in the past and could do so again. • There are ongoing concerns about security in the visitor center. • Major winter storms, power outages, powerline breakages, water lines leaking, etc., limit the ability to maintain appropriate environmental conditions for museum objects. • If the monument's entire museum collection were to be consolidated at a remote location, such as Vernal, Utah, as recommended in an older museum storage plan, it would limit the ability of the monument to use the specimens effectively in exhibits and make scientific studies more difficult for visiting researchers. **Opportunities** • Maintain relationships with partners (quarry operators and scientists) to stay informed of current discoveries and research activities occurring in the basin. • Improve the sprinkler system throughout the facilities where objects are stored (there is no system in the visitor center or in the monument housing and only half of the maintenance building has sprinklers). • Possibility of engaging in a partnership with other national park sites or the Bureau of Land Management and U.S. Forest Service to create a multiagency museum facility in Kemmerer or Diamondville. • Leverage the Intermountain Natural History Association or develop a new friends group to improve current partnerships and fundraising to acquire fossil specimens. • Increase the number of objects acquired through donations by leveraging Intermountain Natural History Association's ability to fundraise on the monument's behalf and by installing a fossil purchase-specific donation box. • Use seasonal staff to show appreciation for those who donate fossils to the monument by updating the donor recognition book. • Explore options for where to best store museum collections, taking into consideration the current NPS Intermountain Region museum storage plan, which calls for Fossil Butte National Monument's museum collections to be housed in Vernal, Utah, with the collections of Dinosaur National Monument if Fossil Butte National Monument cannot properly care for them. • Verify the existence and accuracy of documentation, cataloging, and field records from past collections on monument land that may not be housed in federal repositories.
Existing Data and Plans Related to the FRV	• Museum management plan. • Scope of collections statement. • Museum housekeeping plan. • Museum emergency response pocket guide. • Collection condition survey.

Fundamental Resource or Value	Museum Collections and Fossil Preservation
Data and/or GIS Needs	• Museum fire protection survey. • Forecasting for collection growth and estimated repository space required to house expected collections.
Planning Needs	• Integrated pest management plan. • Museum security plan/assessment. • Museum facility plan (development concept plan.) • Collection management plan. • Climate change scenario planning. • Museum emergency operations plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Museum Properties Management Act of 1955, as amended • Paleontological Resources Preservation Act of 2009 **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS *Management Policies 2006* (§4.1.4) "Partnerships" • NPS *Management Policies 2006* (§4.2.3) "Natural Resource Collections" • NPS *Management Policies 2006* (§5.3.5.5) "Museum Collections" • Director's Order 24: *NPS Museum Collections Management* • NPS *Museum Handbook*, parts I, II, and III • Director's Policy Memorandum 14-02, "Climate Change and Stewardship of Cultural Resources" • Director's Policy Memorandum 15-01, "Addressing Climate Change and Natural Hazards for Facilities"

Fundamental Resource or Value	Exhibits
Related Significance Statements	Significance statement 4
Current Conditions and Trends	**Conditions** • Many of the monument's exhibits contain museum collections so the analysis in the above table is also applicable here. • Exhibits can be changed in-house, and the time and resources required varies considerably depending on type and number of specimens. There is an armature system that facilitates the exchange of items and the monument has all the equipment required. • Some waysides require conceptual or informational updates. • The monument has continued to have successful proposals for exhibit funding because it continues to provide strong projects that use Facility Management Software System data. **Trends** • Exhibits are frequently updated to reflect the most up-to-date science. • The monument is exhausting space for exhibits inside the visitor center. • The monument has recently added more interactive exhibits and made improvements to accessibility in the exhibit space.
Threats and Opportunities	**Threats** • Security and safety systems are outmoded. • Inappropriate behavior by children puts some exhibit cases at risk, although the specimens themselves are well protected inside the cases. • Rodents commonly enter the visitor center but there is no sign of them getting into exhibit cases. • Vandalism and vehicle collisions with waysides (has not yet been a significant issue for the monument). **Opportunities** • Update conceptual errors in existing exhibits. • Continue to make exhibits accessible, e.g., by including improved lighting and developing audio descriptions of internal and external exhibits. • Purchase exhibit hardware to ensure exhibits are kept current. • Update electronic exhibit content by purchasing off-the-shelf kiosk software and recreating the content. Because the exhibit hardware may be nearing the end of its lifecycle, replacement may be required at the same time. • Design and install exhibits to better illustrate the processes of landscape and lake formation (part of a project formulated for fiscal year 2017). • Acquire a rock core and display it as an exhibit.
Existing Data and Plans Related to the FRV	• Draft wayside exhibit plan. • Long-range interpretive plan (2006). • Interpretive media in the Facility Management Software System. • Library of information for exhibits. • GIS locations for all existing waysides. • Museum housekeeping plan. • Scope of collections statement.

Fundamental Resource or Value	Exhibits
Data and/or GIS Needs	• 3D representation of quarry.
Planning Needs	• Building addition for new exhibits (development concept plan). • Comprehensive interpretive plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Museum Properties Management Act of 1955, as amended • Paleontological Resources Preservation Act of 2009 **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS *Management Policies 2006* (§4.2.3) "Natural Resource Collections" • NPS *Management Policies 2006* (§5.3.5.5) "Museum Collections" • Director's Order 24: *NPS Museum Collections Management* • NPS *Museum Handbook*, parts I, II, and III

Fundamental Resource or Value	Fossil Quarriers and Geological / Paleontological Research Institutions
Related Significance Statements	Significance statements 1, 2, 3, 5, and 6
Current Conditions and Trends	**Conditions** • The monument has a good relationship with the majority of the private quarry operators in the Fossil Basin, facilitating knowledge exchange and an occasional specimen donation, as well as opportunities to acquire fossils before they are offered on the open market. • Monument staff communicate regularly with private quarries to ascertain what types of specimens have recently been discovered and what new scientific information is emerging in the area. • There are 12 active fossil quarries in the basin and numerous inactive quarries; 4 quarries have become inactive within the last 30 years. • The majority of fossil quarrying in the basin happens outside of the monument. • The monument has collected data from some private quarries regarding the abundance of types of fossils found. • The monument facilitates communication between researchers and private quarriers regarding scientific studies and shares research results with quarriers. • The monument interprets Haddenham's cabin and quarry and Craig's Quarry, which can be seen across the valley on private land. • The monument interprets a quarry opened in 1968 through waysides. **Trends** • There are an increasing number of quarriers working in the basin. • The amount of scientific research in the basin fluctuates annually.
Threats and Opportunities	**Threats** • Changing personnel could impact rapport between the monument and partners, because many of these relationships are longstanding and dependent on institutional knowledge. • Environmental (weathering) and vandalism threats to the historic Haddenham district. **Opportunities** • Establish an agreement with a quarry in the basin for monument staff to provide interpretation to visitors. • Better interpret area quarries and the work done by the Field Museum of Natural History (which possesses the largest collection of Green River fossils). • Maintain a good working relationship with the ranchers who own the land where the private quarries are located and develop a systematic, participatory relationship with private quarry operators. • Continue to promote research opportunities within the Green River Formation on private quarries, especially for graduate students, in order to advance the scientific understanding of geology and accurately portray it to visitors. • Continue hosting open houses where quarriers convene and build relationships with one another and with the monument.
Existing Data and Plans Related to the FRV	• Map of all active quarries. • Historic structure report for Haddenham cabin (2014). • Haddenham cabin's National Register of Historic Places nomination (listed in 2003).
Data and/or GIS Needs	• Wide variety of research projects to help better understand the ancient organisms and ecosystems and the exceptional fossilization process.

Fundamental Resource or Value	Fossil Quarriers and Geological / Paleontological Research Institutions
Planning Needs	• Monument partner action strategy. • Haddenham district cultural landscape report.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • National Historic Preservation Act of 1966, as amended • Archeological and Historic Preservation Act of 1974 • Historic Sites Act of 1935 • Museum Properties Management Act of 1955, as amended • "Protection of Historic Properties" (36 CFR 800) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS *Management Policies 2006* (§4.1.4) "Partnerships" • Director's Order 24: *NPS Museum Collections Management* • Director's Order 28: *Cultural Resource Management* • NPS *Museum Handbook*, parts I, II, and III

Fundamental Resource or Value	Programs, Education, and Public Outreach
Related Significance Statements	Significance statements 4 and 5
Current Conditions and Trends	**Conditions** • The monument website is up to date and formatted in the current NPS standard. • There is a well-developed school program and the monument has regular school group visits. • Visitation levels spike from late June through mid-August. • Every year visitors come from all 50 states and about 30 foreign countries, and more than 50% of visitors are college educated. • The monument is not a primary destination for most visitors, but rather a "stopover" for visitors coming from or going to other parks in the area (Yellowstone, Grand Teton, Dinosaur), and about 90% of visitors only see the visitor center; however, it is often a primary destination for geology and paleontology enthusiasts and college groups. • Monument-based geology and paleontology curriculum modules targeting middle schools are on the monument website. **Trends** • Primary school group visits have declined with declining funds for field trips, especially in Utah, whereas college and homeschool group visits to the monument have increased. • The monument is better using school chaperones to assist with activities during school group visits, thus reducing demands on monument staff and improving the program quality for the children. • The monument has tried set times for ranger programs but visitation is not steady so the program has evolved to provide ongoing programs (fossil preparation demonstrations) during peak hours and on-demand programs (exhibit tours) when visitors are in the visitor center. • Visitor data show there has been an increase in shoulder season visitation. • Seasonal employees generally have completed geology or paleontology degrees to ensure high-quality ranger programs and informed answers. • There has been an improvement in outreach to target groups at rock shows through educational booths in cooperation with the Fossil Basin Promotion Board. • An increased effort to visit schools to reach the children who do not have fieldtrip opportunities. • There has been an upward tick in visitation over the past few years, but a generally downward trend since the 1990s.

Fundamental Resource or Value	Programs, Education, and Public Outreach
Threats and Opportunities	**Threats** • Further cuts to field trip funding at the state and local level could decrease the number of school groups visiting the monument. • Increased time used on website and social media may reduce staff time available to interact with the people visiting the monument in person but has the potential to reach a greater number of people of the general public that may never have the opportunity to visit the site. **Opportunities** • Make the quarry accessible with a two-way audio-video connection for those who cannot (or do not have time to) get to the quarry. • Expand the use of social media, website, and possible future technology for distance education or programming. • Expand school outreach programs and partnerships with the Kemmerer recreation center (or other pertinent groups). • Update content of the fossil education kit curriculum for second- and third-graders and make available on monument website. • Raise awareness in neighboring parks of Fossil Butte National Monument and encourage them to tell visitors to stop there as they continue their journey. Implement creative strategies to improve visitation of all area parks (e.g., place a map with nearby parks in bathroom stalls). • Complete funding requests for additional exhibits. • Continue to engage in partnerships to increase visitation and stewardship.
Existing Data and Plans Related to the FRV	• The monument has developed curriculum-based programming for schools. • Hockett, Karen, 2003, "Influence of interpretation along a nature trail on visitor attitudes and behavior towards fossils." Ph.D., Virginia Tech. • Social media strategy (2016).
Data and/or GIS Needs	• Detailed visitor survey. • Accessibility assessment.
Planning Needs	• Plan for webpage content. • Monument partner action strategy. • Comprehensive interpretive plan. • Accessibility plan.
Laws, Executive Orders, and Regulations That Apply to the FRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the FRV** • Americans with Disabilities Act of 1990 • Architectural Barriers Act of 1968 • "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines" (36 CFR 1191) **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (chapter 7) "Interpretation and Education" • Director's Order 6: *Interpretation and Education* • Director's Order 42: *Accessibility for Visitors with Disabilities in National Park Service Programs and Services*

Analysis of Other Important Resources and Values

Other Important Resource or Value	Natural Resources
Current Conditions and Trends	**Conditions** • *Physaria condensata, Astragalus lentiginosus, Lepidium integrifolium,* pygmy rabbits, and sage grouse are species of concern found in the monument; *P. condensata, A. lentiginosus,* and *L. integrifolium* are endemic to the region. • The monument protects a significant ungrazed section of sagebrush steppe in southwest Wyoming. • The monument is aggressively trying to control nonnative species; there are more than 70 invasives found in the monument and 15 are actively targeted, including cheatgrass, Canada thistle, and henbane. • A significant population of elk (as many as 700) frequents the monument seasonally, with numbers peaking during hunting season and waning in the spring, with no presence during the summer months. Preliminary data on the impact of elk on aspen in the monument present highly variable results. • There is extreme predator control in land adjacent to the monument that is managed by the Bureau of Land Management and private landowners. • The monument maintains boundary fences to exclude cattle and sheep (Wyoming is a "fence-out" state). **Trends** • Hunting activities (especially the use of all-terrain vehicles) has increased pressure on elk outside of the monument and has led to a significant increase in the number of elk within the monument. • The monument has increased predator concentrations due to severe predator control on neighboring lands. • The invasive creeping foxtail has recently increased in the monument wetlands, seeps, and springs.
Threats and Opportunities	**Threats** • Hunters attempting to hunt or poach wildlife within monument boundaries. • Area ranchers and state and federal agencies controlling predator populations within or adjacent to the monument. • Trespass livestock from adjacent lands can cause significant damage to the sagebrush steppe ecosystem through trampling and overgrazing particularly around water sources. • Elk and snow drifting lead to fence damage, which leads to more trespass livestock and requires maintenance staff to make repairs. • Climate change and resulting increases in the intensity and frequency of drought conditions, extreme heat events, large storms, flooding, erosion, invasive species, and a northward shift in ecosystems. • Demands on monument water from outside the boundary. • Browsing pressure on sensitive shrub communities; there are fewer sprouts per unit area in the monument than in the past, probably due to ungulates. • Nonnative and invasive species may be introduced to the monument during stock trailing activities, by staff and by visitors. • Sheep trailing brings in dogs, which may attack monument wildlife. • Wildlife diseases, especially white nose syndrome in bats, chronic wasting disease in ungulates, and tularemia in rabbits. • Future developments adjacent to the monument, such as wind farms, solar farms, and transmission lines, which have the potential to kill numerous birds and bats. • Natural communities are at risk for harmful effects of air pollution including nutrient enrichment from excess deposition of nitrogen and impacts on ozone sensitive plants. The monument's semi-arid shrubland and wetland are sensitive to the effects of nutrient enrichment, which can alter plant communities and reduce biodiversity. • Climate change drivers threaten to significantly alter the viewshed of the monument through native plant die-back, increase in invasive species, and northward shift in species ranges.

Other Important Resource or Value	Natural Resources
Threats and Opportunities	**Opportunities** • Better manage fences for wildlife crossing and livestock exclusion. • Maintain collaboration and cooperation with the Wyoming Game and Fish Department, the Bureau of Land Management, and area ranchers. • Seek opportunities for funding to improve natural resource management. • Work with neighbors to ensure that any new developments or technology consider potential impacts on the night sky.
Existing Data and Plans Related to the OIRV	• Elk migration data. • Draft fence plan. • Resource management plan (1996). • Vegetation mapping (2010–2011). • Soils map. • GIS for physaria (2009). • Invasive plant control environmental assessment (2013). • Ongoing regional air quality monitoring. • Natural resource condition assessment. • Surplus water study (2008).
Data and/or GIS Needs	• Monitoring and modeling of climate change stressors.
Planning Needs	• Integrated pest management plan. • Resource stewardship strategy. • Update to the fire management plan. • Ungulate management plan. • Climate change scenario planning.
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • Endangered Species Act of 1973 • National Invasive Species Act of 1996 • Lacey Act of 1900, as amended • Migratory Bird Treaty Act of 1918 • Federal Noxious Weed Act of 1974 • Clean Water Act of 1972 • Clean Air Act of 1977 • Secretarial Order 3289, "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS *Management Policies 2006* (§4.1) "General Management Concepts" • NPS *Management Policies 2006* (§4.1.4) "Partnerships" • NPS *Management Policies 2006* (§4.7.2) "Weather and Climate" • NPS *Natural Resource Management Reference Manual 77* • Director's Order 18: *Wildland Fire Management* • NPS *Reference Manual 18: Wildland Fire Management* • Director's Policy Memorandum 12-02, "Applying National Park Service Management Policies in the Context of Climate Change"

Other Important Resource or Value	Scenic Values
Current Conditions and Trends	**Conditions** • Fossil Butte and the Wasatch Formation are primary scenic resources for the monument. The topography (with its ecological overlay) is also an important scenic value. • There is no vehicle access to the Cundick Ridge overlook, a highly scenic location in the monument, although there is hiking access. • The monument's repeater tower on Cundick Ridge acts as a viewshed obstruction. • The monument provides a night sky program in August for the Perseid meteor shower. • Two cellphone towers outside the monument to the southwest are visible from the majority of visitor use areas within the monument. • A double wood pole power line, U.S. Highway 30, County Road 300, and the railroad parallel with the south boundary of the monument are visible from the majority of visitor use areas within the monument. • Artificial light affects the ability to view the night sky and details in the night sky. • Scenic views are sometimes obscured by pollution-caused haze. Average natural visual range is reduced from about 185 miles (without the effects of pollution) to about 145 miles because of pollution at the monument. The visual range is reduced to below 95 miles on high pollution days. **Trends** • There has been reduced pressure on scenery from oil and gas wells in the area.
Threats and Opportunities	**Threats** • Air pollution-caused haze comes from emissions sources including coal-fired power plants, vehicle exhaust, oil and gas production, agriculture, fire, and dust. At night, air pollution scatters artificial lights, increasing the effect of light pollution on the night sky. Coal mine dust can increase haze and reduce visibility in unusual wind conditions. • There is the potential for a U.S. Highway 30 expansion project that would increase road width and the amount of traffic visible from the monument. • There are active leases for wind turbines surrounding the monument, although nothing is expected to be built in the near future. **Opportunities** • Work with planners, developers, and neighbors to ensure that any new developments or technology (e.g., new solar arrays) consider impacts to important viewsheds in the monument. • Remain vigilant of area development potential and engage early in the planning processes to ensure monument views are considered. • Improve monument sustainability and environmental leadership through Climate Friendly Parks certification and action plan.
Existing Data and Plans Related to the OIRV	• NPS Natural Sounds and Night Skies Division night sky assessment. • Soundscape study (very old). • Ongoing regional air quality monitoring. • Natural resource condition assessment.
Data and/or GIS Needs	• Visual resource inventory. • Monitoring and modeling of climate change stressors.
Planning Needs	• Visual resource management plan. • Monument partner action strategy. • Climate change scenario planning. • Resource stewardship strategy.

Other Important Resource or Value	Scenic Values
Laws, Executive Orders, and Regulations That Apply to the OIRV, and NPS Policy-level Guidance	**Laws, Executive Orders, and Regulations That Apply to the OIRV** • Clean Air Act of 1977 • Secretarial Order 3289 "Addressing the Impacts of Climate Change on America's Water, Land, and Other Natural and Cultural Resources" **NPS Policy-level Guidance (NPS *Management Policies 2006* and Director's Orders)** • NPS *Management Policies 2006* (§1.4.6) "Park Resources and Values" • NPS *Management Policies 2006* (§1.6) "Cooperative Conservation Beyond Park Boundaries" • NPS *Management Policies 2006* (§4.7) "Air Resource Management" • NPS *Management Policies 2006* (§4.9) "Soundscape Management" • NPS *Management Policies 2006* (§4.10) "Lightscape Management" • Director's Policy Memorandum 12-02, "Applying National Park Service Management Policies in the Context of Climate Change" • Director's Order 47: *Soundscape Preservation and Noise Management*

Identification of Key Issues and Associated Planning and Data Needs

This section considers key issues to be addressed in planning and management and therefore takes a broader view over the primary focus of part 1. A key issue focuses on a question that is important for a park unit. Key issues often raise questions regarding park unit purpose and significance and fundamental and other important resources and values. For example, a key issue may pertain to the potential for a fundamental or other important resource or value in a park to be detrimentally affected by discretionary management decisions. A key issue may also address crucial questions that are not directly related to purpose and significance, but that still affect them indirectly. Usually, a key issue is one that a future planning effort or data collection needs to address and requires a decision by NPS managers.

The following are key issues for Fossil Butte National Monument and the associated planning and data needs to address them:

- **Museum Storage.** The protection of items in the monument's museum collection is necessary in order to maintain its significance and meet its purpose. Due to the monument's acquisition of numerous museum specimens through donation and partnerships, as well as its active fossil quarry, available space in existing storage facilities is steadily declining. There is a pressing need to estimate what repository space will be required in the future by forecasting the growth of the monument's museum collection, so this has been identified as a high priority data need. Temporary storage areas have several issues that make them inadequate for housing specimens in the long term, including security concerns, utility hazards (leaking pipes and drains), increased risk of fire due to activities in other parts of the structure, and problems maintaining appropriate environmental conditions. The monument identified a need to address collection storage issues, either through cooperation with another museum, retrofits to existing facilities, or by other means not yet explored. The high-priority planning needs identified to address these issues include a museum facility plan and integrated pest management plan. A development concept plan for a building addition for new exhibits was identified as a related medium priority, and this could be combined with the museum facility plan, if appropriate. A museum security plan and assessment and a museum emergency operations plan were identified as low-priority needs.

- **Monument Operations and Workforce Efficiencies.** The monument is in a period of transition, with several long-term employees having recently retired while also dealing with emerging issues in need of staff attention. There are a few aspects of monument operations that could benefit from improved efficiencies and additional support in target areas including biological resources management and law enforcement. Staff noted that there is a need for personnel to deal with looming ecological threats such as invasive species and a growing elk population that could impact native plant communities. Additionally, the safety and security of monument resources is jeopardized by inadequate law enforcement presence. There is partial law enforcement coverage through assistance with other parks and agencies that provide mutual aid. In the past there was an agreement with the Bureau of Land Management for law enforcement services, but it was not effective because the sole ranger for the area provided coverage for more than 1 million acres of federal land. While it is acknowledged that a dedicated law enforcement ranger at the monument is not realistic, there may be other solutions to protect monument resources such as a surveillance system and a long-term law enforcement agreement with another park. There are also pressing issues related to maintenance, such as needed fence repairs and resulting cattle trespass, and unresolved concerns around staff housing.

  The most appropriate tools for addressing these issues are unknown, so the monument identified a business management plan as high priority and a monument partner action strategy as a high priority to strategically consider its options, including options that rely on monument partners. A formal administrative history would consolidate past efforts and provide a backdrop for important decisions that need to be made regarding monument operations and workforce management, and was identified as a medium-priority need.

- **Elk Management.** Elk management has become a pressing, and controversial, topic for the monument, in part because it has become a sanctuary for elk in a region which has recently become very popular with hunters (the monument frequently experiences political and local community pressure to open its doors to hunting). Despite a large and growing population within monument boundaries, there has been only one formal effort to understand the movement patterns of the herds and no efforts to quantify the impact, if any, that elk have on vegetation in the monument. The monument noted a comprehensive elk/vegetation study as a high-priority data need that would eventually inform management decisions regarding elk and other ungulates through an ungulate management plan.

- **Leveraging Partnerships.** Increasing visitation and relevancy for new audiences is an important goal for Fossil Butte National Monument, and staff at the monument would like to leverage their many formal and informal partnerships to that end. The City of Kemmerer, State of Wyoming, Fossil Basin Promotion Board, and other state and national parks in the region all present great potential for mutually beneficial strategies to promote tourism in the area. Additionally, the monument's cooperation with local quarries facilitates the exchange of new knowledge, and strengthening those relationships would ensure the continuity of these important partnerships. Further outreach to interest groups and visitors may provide the resources to acquire valuable specimens as they become available. The monument identified a monument partner action strategy as a high-priority need to begin achieving these important partnership goals.

- **Accessibility.** Facilities, parking lots, exhibits, and waysides at the monument all need to be assessed for weaknesses in accessibility. Issues related to both physical (e.g., infrastructure) and programmatic (e.g., audio-visual media) accessibility prevent the monument from exposing its resources to all visitors. An accessibility assessment and plan were both cited as high priority needs for the monument.

Planning and Data Needs

To maintain connection to the core elements of the foundation and the importance of these core foundation elements, the planning and data needs listed here are directly related to protecting fundamental resources and values, park unit significance, and park unit purpose, as well as addressing key issues. To successfully undertake a planning effort, information from sources such as inventories, studies, research activities, and analyses may be required to provide adequate knowledge of park unit resources and visitor information. Such information sources have been identified as data needs. Geospatial mapping tasks and products are included in data needs.

Items considered of the utmost importance were identified as high priority, and other items identified, but not rising to the level of high priority, were listed as either medium- or low-priority needs. These priorities inform monument management efforts to secure funding and support for planning projects.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	**Planning Needs**	**Priority (H, M, L)**	**Notes**
Museum Collections and Fossil Preservation; Key Issue	Museum facility plan (development concept plan)	H	Provide space with proper environmental controls to store the monument's museum collections with enough space to increase collections for 50 years. Work with other national park units, the Bureau of Land Management, and/or the U.S. Forest Service to construct a cooperative facility with adequate space for their needs. Adequate museum storage space would ensure the monument has the specimens necessary to tell its story to the public through exhibits and programs. Museum specimens yield the information that informs the monument's exhibits and programs, and their storage and preservation is vital to meeting the purpose of the monument. The development concept plan may be combined with the medium priority development concept plan noted below, titled "Building addition for new exhibits," if appropriate."
Key Issue	Business management plan	H	Analyze the monument's financial sustainability and further refine the monument's priorities while considering the staff and financial resources available. Complete workforce analysis, assess areas where alternative funding could be found, and complete a cost-benefit analysis.
Museum Collections and Fossil Preservation; Natural Resources; Key Issue	Integrated pest management plan	H	Needed to properly protect museum objects and the structures that house them from damage by rodents and other pests.
Fossil Quarriers and Geological / Paleontological Research Institutions; Programs, Education, and Public Outreach; Scenic Values; Key Issue	Monument partner action strategy	H	Provide a framework for monument efforts to cooperate with the local fossil quarriers and universities that are important to the understanding of the geology and paleontology of ancient Fossil Lake and inform much of the monument's programming.
Fossil Lake Deposits of the Green River Formation within the Monument; Natural Resources; Scenic Values	Resource stewardship strategy	H	Needed to help the monument synthesize what needs to be done to protect the biological resources along with the geological/paleontological resources and in such a way that it can be accomplished with a small staff. It would integrate climate change considerations throughout.
Programs, Education, and Public Outreach; Key Issue	Accessibility plan	H	Identify where the monument can improve accessibility of facilities, exhibits, and programming. The plan would help organize efforts and focus resources to systematically remove barriers over time.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	**Planning Needs**	**Priority (H, M, L)**	**Notes**
Exhibits; Programs, Education, and Public Outreach	Comprehensive interpretive plan	M	The monument's long-range interpretive plan is more than 10 years old, and monument staff need a new plan to guide future efforts in light of new scientific understanding and the progress that has been made in exhibits and programming during the last 10 years.
Exhibits	Building addition for new exhibits (development concept plan)	M	The current visitor center was originally designed with a minimal amount of space dedicated to exhibits. While it was adequate at the time, much more is now known about monument resources and there are more specimens available to tell the story. Exhibits have expanded beyond the designated space and are filling all available publicly accessible space in the visitor center. The visitor center was originally designed to be expanded for additional exhibit space. The development concept plan could be combined with the high priority development concept plan noted above titled "Museum facility plan," if appropriate.
Fossil Quarriers and Geological / Paleontological Research Institutions	Haddenham district cultural landscape report	M	The Haddenham Cabin is in the National Register of Historic Places. During the nomination process it became apparent the cabin was only one of several pieces that tell the human story of early fossil collecting in the Fossil Butte area. A cultural landscape report would help the monument determine which components are necessary to tell the complete story of the early fossil collecting activities of David Haddenham.
Natural Resources	Update to the fire management plan	M	The plan needs to be updated in light of a prolonged drought that has negatively impacted aspen stands. The current plan calls for burning aspen stands to encourage regeneration, which could kill the stands if drought conditions continue. Consider climate change projections in this plan.
Fossil Lake Deposits of the Green River Formation within the Monument; Museum Collections and Fossil Preservation; Natural Resources; Scenic Values	Climate change scenario planning	M	Provide scenarios of climate change impacts that the monument can actively use in management, so actions do not magnify climate change effects. This plan would assist the monument in understanding climate change effects to protect the monument's resources. Scenario planning would complement the climate change vulnerability assessment that was included in the monument's natural resource condition assessment.
Museum Collections and Fossil Preservation	Collection management plan	M	A collection management plan would outline fossil resources that the monument would like to collect for research, exhibits, and programs.

Planning Needs – Where A Decision-Making Process Is Needed			
Related to an FRV, OIRV, or Key Issue?	**Planning Needs**	**Priority (H, M, L)**	**Notes**
Museum Collections and Fossil Preservation; Key Issue	Museum security plan/assessment	M	The monument's museum collections, both in storage and on exhibit, contain many scientifically significant fossils. A security plan is needed to identify potential threats so they can be addressed to protect the collections.
Programs, Education, and Public Outreach	Plan for webpage content	L	Webpage content planning would include identifying future content, and planning for future needs (photos, video, etc.). This might be nested within a comprehensive interpretive plan.
Natural Resources; Key Issue	Ungulate management plan	L	Would consider the threat of chronic wasting disease and other diseases as well as a general approach to management of the increasing elk population present in the monument. Climate change considerations should be integrated into the plan.
Scenic Values	Visual resource management plan	L	A visual resource management plan is needed to inform management decisions at the monument. This plan would use data collected during the visual resource inventory process to identify goals, objectives, and strategies for protecting the valued characteristics of important views within and beyond monument boundaries. It would recommend steps to preserve key views that are associated with historically significant areas of the landscape. Climate change considerations should be integrated into the plan.
Museum Collections and Fossil Preservation; Key Issue	Museum emergency operations plan	L	The monument has a museum emergency response pocket guide that provides guidance for actions during an emergency impacting museum collections, but the emergency operations plan would entail a risk analysis and evacuation plan.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	**Data and GIS Needs**	**Priority (H, M, L)**	**Notes**
Key Issue	Elk / vegetation study	H	It is currently unknown what, if any, impact the increased number of elk during the fall and winter is having on vegetation communities. This study would provide the monument with data on the impact elk are having on the ecosystem before a management decision is made through an ungulate management plan. Climate change considerations should be integrated into the plan.
Fossil Lake Deposits of the Green River Formation within the Monument	Drill rock cores across Fossil Basin for use in scientific studies and for exhibit	H	Obtaining rock cores would help in better understanding Fossil Lake's history. Cores are more likely to contain minerals that would dissolve in surface exposures. Once obtained, half of one core would be placed on exhibit with labels identifying key beds and characteristics.
Programs, Education, and Public Outreach ; Key issue	Accessibility assessment	H	Would identify where the monument can improve accessibility of facilities, exhibits, and programming and would inform the high-priority accessibility plan.
Fossil Lake Deposits of the Green River Formation within the Monument; Natural Resources; Scenic Values	Monitoring and modeling of climate change stressors	H	Would inform the climate change scenario planning. Part of this monitoring and modeling effort would focus on vegetation monitoring related to impacts of ungulates and a changing climate.
Museum Collections and Fossil Preservation; Key Issue	Forecasting for collection growth and estimated repository space required to house expected collections	H	The need to forecast the collection growth and estimated repository space has been an issue for many years. The enabling legislation requires the monument to interpret scientific specimens, and in order to properly house them there must be adequate museum space. This forecast would inform the museum facility plan and museum collection plan.
Programs, Education, and Public Outreach	Detailed visitor survey	M	This survey would be based on the detailed 2001 and 2011 visitor use surveys and would provide the monument with visitation trends.
Key Issue	Formal administrative history	M	The administrative history would inform several high-priority plans, such as the business management plan and monument partner action strategy. It is needed to document circumstances and of when and why past decisions were made.
Museum Collections and Fossil Preservation	Museum fire protection survey	M	A museum fire protect survey would examine the risk of fire to the monument's fossil collection.
Museum Collections and Fossil Preservation	Collection condition survey	M	A collection condition survey would evaluate the current condition of the monument's collection.

Data Needs – Where Information Is Needed Before Decisions Can Be Made			
Related to an FRV, OIRV, or Key Issue?	**Data and GIS Needs**	**Priority (H, M, L)**	**Notes**
Fossil Quarries and Geological / Paleontological Research Institutions	Research projects to help better understand the ancient organisms and ecosystems and the exceptional fossilization process	M	Seek out research projects that would help expand the knowledge base at the monument.
Exhibits	3D representation of quarry	L	A digital reconstruction of the monument's research quarry would help visitors understand the distribution of the fossils in space and time. Ideally this product would be easily updated each year as the quarry continues to produce more fossils.
Scenic Values	Visual resource inventory	L	In addition to the visibility assessment associated with a viewshed analysis, the inventory will identify the scenic quality and NPS/visitor values of important vistas showing nearby geologic features relevant to interpretation of Fossil Basin. The inventory would serve as the baseline for development of a visual resource management plan.
Fossil Lake Deposits of the Green River Formation within the monument	Paleontological research priority list	L	The monument should formalize a list of known research needs and then continuously update the list with new needs so that students and researchers know what opportunities exist at the monument.

Part 3: Contributors

Fossil Butte National Monument

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Appendixes

Appendix A: Enabling Legislation for Fossil Butte National Monument

Public Law 92-537

AN ACT

To establish the Fossil Butte National Monument in the State of Wyoming, and for other purposes.

October 23, 1972
[S. 141]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That, in order to preserve for the benefit and enjoyment of present and future generations outstanding paleontological sites and related geological phenomena, and to provide for the display and interpretation of scientific specimens, the Fossil Butte National Monument (hereinafter referred to as the "monument") is hereby established, to consist of lands, waters, and interests therein within the boundaries as generally depicted on the drawing entitled "A Proposed Fossil Butte National Monument, Wyoming," Numbered FBNM–7200, dated April 1963, revised July 1964, and totaling approximately eight thousand one hundred and eighty acres. The Secretary of the Interior (hereinafter referred to as the "Secretary") may revise the boundaries of the monument from time to time by publication of a notice to that effect in the Federal Register, except that at no time shall the boundaries encompass more than eight thousand two hundred acres.

Fossil Butte National Monument, Wyo. Establishment.

Notice of boundary revisions, publication in Federal Register.

SEC. 2. The Secretary shall administer the monument pursuant to the Act approved August 25, 1916 (39 Stat. 535; 16 U.S.C. 1, 2–4), as amended and supplemented.

Administration.

SEC. 3. Within the boundaries of the monument the Secretary may acquire lands and interests in lands by donation, purchase, or exchange, except that lands or interests therein owned by the State of Wyoming or a political subdivision thereof may be acquired only by donation or exchange.

Land acquisition.

SEC. 4. (a) For a period of ten years, and for not more than ten years thereafter if extended by the Secretary, the continuation of existing uses of Federal lands and waters within the monument for grazing and stock watering may be permitted if the Secretary finds that such uses will not conflict with public use, interpretation, or administration of the monument: *Provided*, That the use of lands within the monument for stock driveways shall continue in perpetuity at such places where this use will not conflict with administration of the monument.

Stock grazing and watering.

(b) Upon termination of the uses set forth in subsection (a) of this section, the Secretary of the Interior is authorized to provide for the disposition and use of water surplus to the needs of the monument, to a point or points outside the boundaries of the monument.

Water surplus, disposition.

SEC. 5. There are hereby authorized to be appropriated $378,000 for land acquisition and not to exceed $4,469,000 (June 1971 prices) for development, plus or minus such amounts, if any, as may be justified by reason of ordinary fluctuations in construction costs as indicated by engineering cost indices applicable to the type of construction involved herein.

Appropriation.

Approved October 23, 1972.

Public Law 92-538

October 23, 1972
[H.R. 13694]

AN ACT

To amend the joint resolution establishing the American Revolution Bicentennial Commission, as amended.

American Revolution Bicentennial Commission.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the joint resolution entitled "Joint resolution to establish the American Revolution Bicentennial Commission, and for other purposes", approved July 4, 1966 (80 Stat. 259), as amended, is further amended as follows:

Appropriation.
Ante, p. 43.

Section 7(a) is amended to read as follows:

"SEC. 7. (a) There is hereby authorized to be appropriated to carry out the purposes of this Act until February 15, 1973, $3,356,000, of which not to exceed $2,400,000 shall be for grants-in-aid pursuant to section 9(1) of this Act."

Grants-in-aid.

SEC. 2. Section 9 is amended by the addition of the following new subsections:

"(2) make grants to nonprofit entities including States, territories, the District of Columbia, and the Commonwealth of Puerto Rico (or subdivisions thereof) to assist in developing or supporting bicentennial programs or projects. Such grants may be up to 50 per centum of the total cost of the program or project to be assisted;

"(3) in any case where money or property is donated, bequeathed, or devised to the Commission, and accepted thereby for purposes of assisting a specified nonprofit entity, including States, territories, the District of Columbia, and the Commonwealth of Puerto Rico (or subdivisions thereof), for a bicentennial program or project, grant such money or property, plus an amount not to exceed the value of the donation, bequest, or devise: *Provided*, That the recipient agrees to match the combined value of the grant for such bicentennial program or project."

Approved October 23, 1972.

Appendix B: Inventory of Administrative Commitments

Title / Agency / Organization	Purpose/Description
Memorandums of Understanding	
Volunteer fire department	Structural and wildland fire suppression
Wyoming Game and Fish	Game warden to assist with game violations (concurrent jurisdiction)
Bureau of Land Management	Water use for cattle grazing
Memorandums of Agreement	
Intermountain Natural History Association	5-year agreement with Dinosaur National Monument
Contingency for IT with Bureau of Land Management	Use of IT services in case of emergency
Sheriff's department	Dispatch and law enforcement support
Lincoln County search and rescue, emergency medical services	Visitor and staff emergency rescue
Emergency medical services	Visitor and staff medical emergency
Interagency Agreements	
U.S. Geological Survey	Elk study
Wildland fire with U.S. Forest Service, Bureau of Land Management	Wildland fire suppression
Bureau of Land Management	The monument holds an inactive permit for a quarry on adjacent BLM land
Cooperative Agreements	
Cooperative Ecosystem Studies Unit with Utah State University	Related to vegetation monitoring for elk impacts
Youth agreements, Student Conservation Association, Geologists in Parks, Youth Conservation Corps	Visitor programs, natural resource conservation projects, maintenance projects
Special Park Uses	
Special use permit for stock trails	Legislative mandate to permit stock trailing where it does not interfere with other park purposes
Commercial Services	
Informal information sharing with commercial quarries	For knowledge sharing, acquisition of specimens, etc.
Commercial use permit	Visitor convenience items; tied with Dinosaur National Monument

Appendix C: Traditionally Associated Tribes

Traditionally associated tribes refer to those groups that have had a significant connection to a place that has endured for two generations or more. The following list was derived from the NPS Intermountain Region's tribal contact database.

Tribal Contacts

Apache Tribe of Oklahoma
PO Box 1330
Anadarko, OK 73005-1220

Arapaho Tribe of the Wind River Reservation, Wyoming
PO Box 396
Fort Washakie, WY 82514

Oglala Sioux Tribe
PO Box 2070
Pine Ridge, SD 57770

Shoshone Tribe of the Wind River Reservation, Wyoming
PO Box 538
Fort Washakie, WY 82514

Shoshone-Bannock Tribes of the Fort Hall Reservation
PO Box 306
Fort Hall, ID 83203

Ute Indian Tribe of the Uintah & Ouray Reservation, Utah
PO Box 190
Fort Duchesne, UT 84026

Appendix D: Past and Ongoing Park Planning and Data Collection Efforts

Document	Date
Proposed Fossil Butte National Monument	8/1/1964
Inventory and Evaluation (FOBU Soils)	1973
Archeological Survey	1/1/1974
A Vegetation Survey of Fossil Butte National Monument, Kemmerer, Wyoming	6/1974
Soil Survey, Fossil Butte National Monument, Lincoln County, Wyoming	12/1974
Historic Studies Plan	1/1/1975
Geological History of Fossil Butte	1/1/1975
Soil Investigation: Fossil Butte National Monument, Kemmerer, Wyoming	1978
Feasibility of Developing Ground Water Supplies in Fossil Butte National Monument, Wyoming	1978
Interpretive Prospectus	11/1/1984
Statement for Management	9/1/1985
Paleoenvironments and Paleoecology of the Eocene Green River Formation	9/1/1986
Fossil Butte National Monument Cultural Sites Inventory	10/1986
Archeological Evaluation of Three Sites Along Chicken Creek Road	1/1/1987
Archeological Survey of New Visitor Center Proposed Location	6/30/1987
Archeological Survey of Fourth Proposed Maintenance Facility Location	12/3/1987
Archeological Investigations in Area of Three Springs	12/11/1987
General Management Plan with Amendment	9/1/1988
Miscellaneous Archeological Inventories and Resource Evaluations	6/2/1989
Weather data 1990 to present collected and submitted to NOAA	1990 to the present
Archeological Survey of Haddenham Cabin Site	9/30/1991
Paleo-Historical Fluctuations in Paleogeography, Depositional Environment and Chemistry of Eocene Fossil Lake	5/1/1992
Restoration Management Plans for NPS Prairie Sites	6/1/1993
Archeological Inventory of Four Stock Dams	3/22/1996
Statement for Management	6/1/1996
Baseline Water Quality Data Inventory and Analysis	10/1/1998
Chicken Creek Restoration Project	11/1/1999
Resource Management Plan	1/1/2000
Inventory Study Plan for Vascular Plants and Vertebrates	9/30/2000
Vascular Plant Species Checklist and Rare Plants	10/9/2000
Findings and Recommendations – June 26–27, 2000 Reconnaissance evaluation of landslide impacts at Fossil Butte National Monument	2001
Characteristics of Visitors to Fossil Butte NM and the Influence of the Visitor Center on Fossil Knowledge and Ethics	2002

Document	Date
FOBU plant species list	2000
Findings and Recommendations – June 26–27, 2000 Reconnaissance evaluation of landslide impacts at Fossil Butte National Monument	2001
Herpetofauna Inventories	1/1/2002
Paleontological Resource Inventory	1/1/2002
Museum Management Plan	9/1/2002
Characteristics of Visitors to Fossil Butte NM and the Influence of the Visitor Center on Fossil Knowledge and Ethics	2002
Mammal Inventory SCPN	2/15/2003
National Register of Historic Places Chicken Ranch	6/5/2003
Vital Signs Phase II Report NCPN	9/30/2003
National Register of Historic Places Haddenham Cabin	12/28/2003
Ozone risk assessment for Northern Colorado Plateau Network	2004
Status of *Lepidium integrifolium var integrifolium* (entire-leafed peppergrass) in Wyoming	2004
Findings and Recommendations – May 17–18, 2004 Site Visit – Evaluation of disturbed land at FOBU	2004
Wildland Fire Management Plan	1/1/2005
Cycle 3 Road Inventory	8/1/2005
Vital Signs Monitoring Plan	9/1/2005
Pygmy Rabbit (*Brachylagus idahoensis*) surveys on Fossil Butte National Monument, Kemmerer, WY	2005
Service Springs Inventory – NCPN	5/1/2006
Long-Range Interpretive Plan	6/1/2006
Weather and Climate Inventory NCPN	8/1/2006
Surplus Water	10/1/2008
Bird Monitoring NCPN	12/1/2008
Vascular Flora Checklist	5/1/2009
Climate Monitoring NCPN	5/1/2009
Physaria condensata in FOBU project	2009
Vegetation Classification and Mapping Project	5/1/2010
Land Cover Monitoring Brief	1/1/2011
Land Condition Monitoring Brief	1/1/2011
Northern Rocky Mountains Invasive Plant Management Plan	1/1/2011
Vegetation Mapping Brief	1/1/2011
Nitrogen Sensitivity NCPN	2/1/2011
Acidification – NCPN	4/1/2011
Acidification – Main Report	4/1/2011
Visitor Study	6/1/2011

Document	Date
Remote Sensing of Vegetation Phenology and Snow-Cover Extent NCPN	6/1/2011
Impacts of Visitor Spending on Local Economy	8/1/2011
Evaluation of the sensitivity of inventory and monitoring national parks to nutrient enrichment effects from atmospheric nitrogen deposition: Northern Colorado Plateau Network (NCPN)	2011
Evaluation of the sensitivity of inventory and monitoring national parks to acidification effects from atmospheric sulfur and nitrogen deposition: Northern Colorado Plateau Network (NCPN)	2011
Fossil Butte plant pathologist site visit	2011
Total Nitrogen and Total Phosphorus in Surface Water NCPN	1/1/2012
Climate Monitoring Brief	1/1/2012
Landscape Dynamics Brief	1/1/2012
Vascular Plant Species Discoveries NCPN	5/1/2012
Rare Plants	7/25/2012
Scope of Collections Statement	9/28/2012
Geologic Resource Inventory	10/1/2012
Sagebrush Steppe Vegetation Monitoring	10/1/2012
Climate Monitoring NCPN	1/1/2013
Natural Resource Monitoring Brief	1/1/2013
Land Surface Phenology Monitoring Brief	1/1/2013
Invasive Exotic Plant Monitoring Brief	1/1/2013
Invasive Exotic Plant Monitoring	5/1/2013
Landbird Monitoring Brief	1/1/2014
Landbird Monitoring	7/1/2014
Superintendent's Compendium	7/3/2014
Recent Climate Change Brief	7/25/2014
Visitor Use Statistics	12/4/2014
List of Classified Structures (database)	12/4/2014
Tribal Contacts	12/4/2014
Species Checklist	12/4/2014
Historic Structure Report for the Haddenham Cabin	2014
Museum housekeeping plan	2016
Sage grouse lek counts	2016
FOBU soils survey	In progress
Elk Migration study data GPS collar data collected 2005–2009	In progress
NPSpecies, Ozone Sensitive Species in Fossil Butte National Monument	Ongoing
Air Quality Conditions & Trends by NPS Units: For Fossil Butte National Monument	Ongoing

Intermountain Region Foundation Document Recommendation
Fossil Butte National Monument

March 2017

This Foundation Document has been prepared as a collaborative effort between park and regional staff and is recommended for approval by the Intermountain Regional Director.

3-8-17

RECOMMENDED
Angela Wetz, Superintendent, Fossil Butte National Monument **Date**

3/24/17

APPROVED
Sue E. Masica, Regional Director, Intermountain Region **Date**

As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

FOBU 174/136772
March 2017

Foundation Document • Fossil Butte National Monument

NATIONAL PARK SERVICE • U.S. DEPARTMENT OF THE INTERIOR