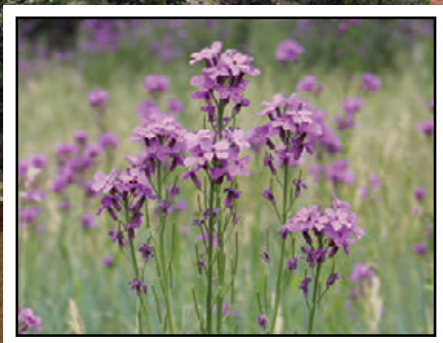




# RESOURCE STEWARDSHIP STRATEGY SUMMARY

## DEVILS TOWER NATIONAL MONUMENT WYOMING







## CONTENTS

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Introduction.....	1
Purpose of a Resource Stewardship Strategy .....	1
Intent of this Summary Document.....	2
Brief Description of Devils Tower National Monument .....	4
Integrating Climate Change Scenario Planning Into The Development of the Resource Stewardship Strategy for Devils Tower National Monument .....	6
Priority Resources .....	11
Priority Resource Summaries.....	12
Key Park Issues, Stressors, and Threats .....	27
Non-Climate Key Issues, Stressors, and Threats.....	27
Climate Scenario-Related Stressors and Potential Implications .....	33
Stewardship Goals.....	43
High-Priority Stewardship Activities .....	53
Ongoing Implementation of the Resource Stewardship Strategy .....	63
References .....	64
Appendix A: Devils Tower National Monument Comprehensive List of Stewardship Strategies And Respective Priorities.....	67
Contact Information .....	93

## FIGURES

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Figure 1. Map of Devils Tower National Monument .....	5
Figure 2. Forecast and Scenario Planning.....	8
Figure 3. RSS Implementation Process .....	63

## TABLES

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Tables 1a–1n. Key Issues, Stressors, and Threats, Potential Implications, and Affected Resources .....	33-42
Tables 2a–2o. Long-Term and Short-Term Stewardship Goals for Priority Resources .....	44-52
Tables 3a–3o. High-Priority Stewardship Activities for Priority Resources .....	54-62





# INTRODUCTION

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## PURPOSE OF A RESOURCE STEWARDSHIP STRATEGY

A resource stewardship strategy (RSS) is a strategic plan, intended to help park managers achieve and maintain desired resource conditions over time (see NPS Management Policies 2006 [§2.3.2]). As part of a park's planning portfolio, a resource stewardship strategy serves as a bridge between the park's foundation document, other plans, and everyday management of its natural and cultural resources.

More specifically, a resource stewardship strategy is a dynamic planning tool used to set stewardship goals and track progress in achieving and maintaining desired natural and cultural resource conditions. All resource stewardship goals and activities should be based on science, law, NPS management policies, and the long-term public interest.

Essentially, a resource stewardship strategy establishes a framework and a coordinated process for

1. evaluating and summarizing existing information about priority park resources (including key issues, stressors, and threats),
2. using science and scholarship to establish stewardship goals for priority resources,
3. integrating natural and cultural resource management to achieve stewardship goals, and
4. determining what stewardship activities are needed to get us “from where we are to where we want to be.”

This information provides a basis for making informed resource management decisions for specific project proposals and for developing and revising annual work plans over time.

A resource stewardship strategy is not a static document or one-time effort. Rather, it is a dynamic framework that should be routinely updated as conditions change; new issues, stressors, or threats are identified; and activities are accomplished. A resource stewardship strategy is reviewed by NPS subject-matter experts and decision makers; however, it is not a publicly reviewed decision document.

The RSS process also provides an opportunity for a park to take an integrated approach to resource management by capitalizing on overlapping opportunities among and within disciplines, identifying stewardship activities that benefit multiple resources, or addressing larger parkwide issues. Taking an integrated approach can result in more effective stewardship for resources through the use of science, scholarship, research, policy, interpretation, and direct management.

## INTENT OF THIS SUMMARY DOCUMENT

This summary document is intended to provide readers with a snapshot of the resource stewardship strategy for Devils Tower National Monument. For the sake of simplification and abbreviation, this unit of the national park system will also be referred to as “the monument” or DETO in this document. This document serves as a communication tool that complements the dynamic and evolving RSS desktop application that is actively used for resource management. This summary is not intended to describe all of the elements in the resource stewardship strategy, but instead focuses on those components of the strategy that are essential for communicating information about the monument’s plan to address key management issues and seize opportunities for those resources identified as priority natural and cultural resources.

This document includes a summary of key issues, stressors, and threats affecting monument resources; brief descriptions of the monument’s priority resources; stewardship goals for priority resources and stewardship activities determined to be high priorities for the next 3 to 5 years. In addition, this document describes how climate change scenario planning was integrated into the resource stewardship development process for Devils Tower National Monument. The document concludes with a brief description of future RSS implementation. It is important to remember that implementation of the resource stewardship strategy is an ongoing process, with necessary updates and revisions occurring as resource and management conditions change and stewardship activities are conducted.

The organization of this summary document generally parallels the RSS development process. Some key terms that are used throughout this summary document are defined below.



## DEFINITIONS OF KEY TERMS

**Priority Resource:** A cultural or natural resource or value that the National Park Service manages or monitors to maintain a park unit's purpose and significance, to address policy/law mandates, or to address scholarly and scientific research needs or findings.

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**Priority Resource Component:** An aspect or attributing resource that is integral to the functionality, importance, or condition of a priority resource and can be managed or monitored practically over the next five-year horizon. A priority resource component is included, or nested, under the associated priority resources.

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**Stewardship Activity:** One or more initiatives that lead to the achievement of a short-term stewardship goal. On its own, a stewardship activity should produce a specific deliverable or outcome. Activities may include assessments, documentation, identification, maintenance, operations, resource protection, thematic studies, cataloging, evaluation, interpretation, planning, training, data recovery, education, inventory, monitoring, research, survey, treatment, restoration, or other types of management.

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**Stewardship Goal:** A description of what resource condition or information that managers are working to achieve for a particular priority resource or component. Stewardship goals guide the National Park Service in its aim to enhance information; improve or maintain resource conditions; address issues, stressors, or threats; or achieve other park stewardship needs related to the priority resource such as increasing collaboration with partners or expanding education, interpretation, and other programming

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**Strategy:** A tactical path forward defined through achievable actions that maintain or improve aspects of a priority resource / component. Strategies start with a stewardship goal and include a comprehensive set of activities to achieve that goal. Strategies are logically organized, science/scholarship-based, well documented, and reviewed by subject-matter experts. The typical timeframe for executing a strategy is short term typically three to five years, depending on a park's needs.

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## BRIEF DESCRIPTION OF DEVILS TOWER NATIONAL MONUMENT

Located on the northwest edge of the Black Hills in northeastern Wyoming, Devils Tower is one of the most conspicuous geologic features of the Black Hills region—a rocky sentinel rising 1,267 feet above the Belle Fourche River and the surrounding grasslands and ponderosa pine forests. American Indians, fur trappers, explorers, and settlers alike were awed by the majesty of Devils Tower. Also known in numerous tribal traditions as Bear Lodge, Devils Tower is a sacred site for Northern Plains Indian tribes. They have held sacred ceremonies near this remarkable geologic formation for thousands of years. From the earliest native peoples to local ranchers and settlers, Devils Tower has been a gathering place, a place of community, and a place of refuge. Many share their stories about Devils Tower from generation to generation.

In 1906, President Theodore Roosevelt proclaimed Devils Tower the nation's first national monument under the Antiquities Act. Today, the 1,347-acre monument attracts well over 400,000 visitors annually. American Indian people come to the site drawn by sacred and spiritual traditions. Rock climbers visit from around the world to scale the tower itself—hundreds of parallel cracks make the tower one of the finest traditional crack climbing areas in North America. Families, bikers, and artists alike come to be inspired by the tower's other-worldly qualities, impossible proportions, and serene setting.

The following purpose statement for Devils Tower National Monument lays the foundation for understanding what is most important about the monument.

*The purpose of Devils Tower National Monument, also known to many as Bear Lodge, is to protect and preserve a world class geologic and sacred landmark that has shaped thousands of years of American Indian culture and the history of the northern Great Plains.*

The following significance statements have been identified for Devils Tower National Monument.

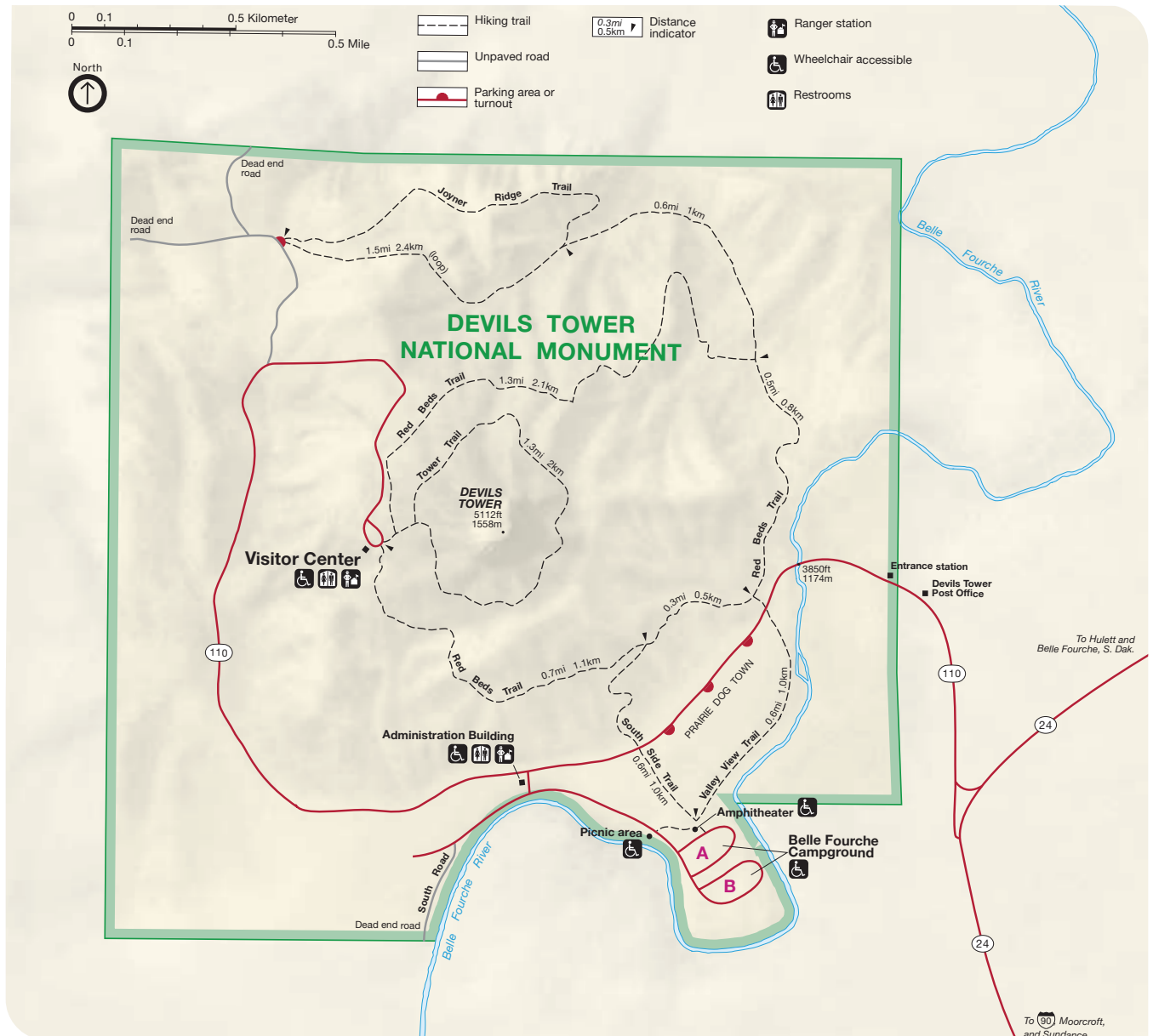
- *Devils Tower is a monolith of phonolite porphyry, a rare igneous rock. With more than 1,200 feet of prominence above the surrounding landscape, it is the iconic natural landmark in the northern Great Plains. It has many visually stunning, symmetrical, columnar joints, which are the tallest and the widest of their kind in the world.*
- *Devils Tower is sacred to many American Indians. Their histories are rich with oral stories and astronomical and ecological knowledge tied to Bear Lodge.*
- *Devils Tower's unique columns and vertical cracks make it one of the premier areas in the world for rock climbing. It boasts more than a century of colorful climbing history.*
- *At Devils Tower, mountain and northern plains species converge to create an ecological zone distinctive to the Black Hills.*
- *Devils Tower National Monument is the world's first national monument. In choosing Devils Tower as the first place to be protected by the 1906 Antiquities Act, President Theodore Roosevelt broadened the intended use of the act by including both its scientific and cultural significance.*

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1. There are many Indian names for Devils Tower, including Bear Lodge, Bear Lodge Butte, Grizzly Bear's Lodge, Bear's House, Bear's Tipi, Bear Peak, Bear's Lair, Grey Horn Butte, and Tree Rock.



Figure 1. Map of Devils Tower National Monument



## INTEGRATING CLIMATE CHANGE SCENARIO PLANNING INTO THE DEVELOPMENT OF THE RESOURCE STEWARDSHIP STRATEGY FOR DEVILS TOWER NATIONAL MONUMENT

This resource stewardship strategy represents the collaborative efforts of National Park Service (NPS) personnel from the monument; the NPS Regional Office Serving Interior Regions 6, 7, and 8, the NPS Cultural Resources, Partnerships and Science Directorate (CRPS); the NPS Natural Resource Stewardship and Science Directorate (NRSS); the NPS Climate Change Response Program (CCRP), the U.S. Geological Survey (USGS); the Department of Interior North Central Climate Adaptation Science Center (NC CASC); and the NPS Denver Service Center, Planning Division (DSC-P). It is based on information about park resources that was available at the time of RSS development and on the experience and professional judgment of resource specialists.

To help resource managers plan and respond effectively to climate change-related key issues, stressors, and threats, CCRP, DSC-P, USGS, and NC CASC representatives developed a pilot project that dovetails the RSS process with the climate change scenario planning process. Climate scientists, adaptation specialists, natural and cultural resource specialists, and planners worked with managers and subject-matter experts at the monument to integrate climate change scenario planning into the development of this resource stewardship strategy for DETO. This supplemental project was funded by the NC CASC.

In developing the resource stewardship strategy, the project team followed the step-by-step process established by a national NPS working group that formed to provide direction and oversight for RSS efforts nationwide. These standardized RSS steps include: gathering resource information; evaluating resource information and identifying key issues, stressors, and threats; identifying priority resources; developing resource stewardship goals; and identifying and prioritizing stewardship activities that fulfill the goals. However, unlike most other RSS projects, prior to the commencement of these standardized RSS steps, the DETO RSS process was preceded by additional climate change scenario planning steps. Ultimately, this scenario planning component informed the RSS development process in a way that yielded climate-smart stewardship strategies. A more detailed explanation of the overall integrated process is described below.





## Background

Ongoing anthropogenic climate change is evident across the national park system. Mean temperatures in most parks, for example, are already extreme compared to the recent historical record (1901–2012; Monahan and Fisichelli 2014). Climate change—in conjunction with other stressors that it often amplifies (e.g., pollution, drought, nonnative species, pests)—is fundamentally altering ecosystem properties, processes, and composition. Impacts and vulnerabilities across the system reflect the diversity of parks and include more frequent and severe wildfires, longer growing seasons, declining snowpack and earlier runoff, loss of sea ice, thawing permafrost, flooding and erosion, increased storm surge and saltwater intrusion into freshwater systems, vegetation type conversion, species extirpation and range shifts, phenological mismatches, and pest outbreaks and range expansions. These changes, in turn, affect all aspects of park management—from natural and cultural resource management to facilities, operations, and visitor experience.

Relevant scientific information about climate change and its effects is increasingly abundant, but considerable uncertainty regarding future climate changes, the rates of those changes, and the responses of the cultural and natural resources to those changes still exists. Forward-looking resource stewardship in an era of continuous change requires effective approaches for understanding and working with consequential and irreducible uncertainty.

## Methods for this Integrated Project

Before the standardized steps of the DETO RSS development process were conducted, staff from the monument, Climate Change Response Program, US Geological Survey, North Central Climate Adaptation Science Center, and Denver Service Center, Planning Division collaborated to develop a set of climate-resource scenarios for the monument based on an existing scenario planning approach that has been developed and refined by the National Park Service and partners. The scenario planning approach works with uncertainty and is based on expert knowledge and synthesis of existing science (NPS 2013, Fisichelli et al. 2016a, Fisichelli et al. 2016b, Star et al. 2016, Runyon et al. 2020). The group used this approach to identify key climate sensitivities of an array of park resources, examine a range of plausible future conditions, and identify the implications of these climate futures for park resources.

In addition to the standard products of an RSS development process (i.e., RSS summary document and RSS desktop application), this project also produced: (1) a report that describes the climate change scenario planning process in detail and summarizes the DETO-specific climate-resource scenarios and management implications (Schoorman et al. 2019), and (2) supplemental RSS guidance that provides a repeatable methodology for deeply integrating climate change-informed scenario planning into the RSS process (NPS 2019). Furthermore, climate change-informed resource stewardship goals and activities in this RSS represent operationalization of insights and understandings from this scenario-based analysis.

## Climate Change Scenario Planning

The primary objective of integrating scenario planning into resource management planning is to help resource managers and planners assess and work with critical future uncertainties and develop climate change-informed management and planning decisions. Scenario planning is a structured approach to work with consequential uncertainties and is increasingly being used by resource managers (Rowland et al. 2014, Star et al. 2016, Runyon et al. 2020). It is a flexible tool that is useful for understanding potential climate change implications and uncertainties in a way that is relevant to resource and landscape management (IPBES 2016). Scenario planning facilitates decision making by providing a structured process for building and thinking about a range of plausible, relevant, and highly consequential futures that managers may face, not simply what is thought to be most likely (Figure 2, NPS 2013).

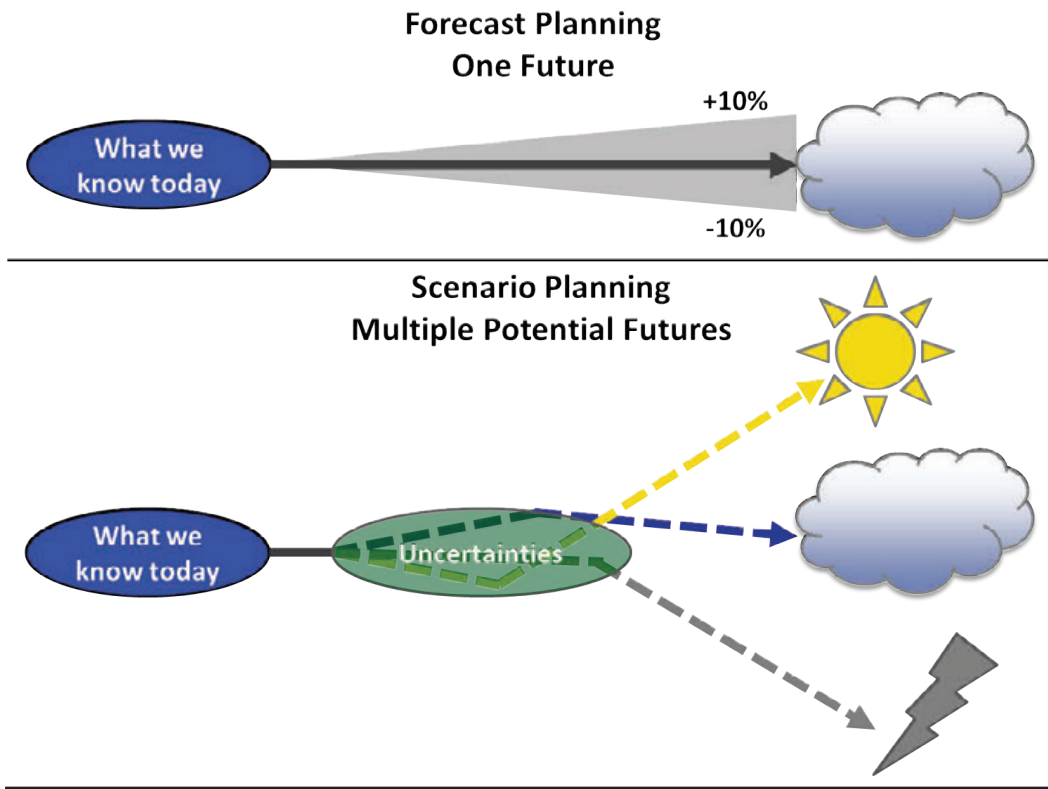


Figure 2. Forecast and Scenario Planning. Forecast-based approaches to planning (top panel) use predictions of a single future within a range of probability (dashed lines). Scenarios (bottom panel) offer a range of future conditions that are all plausible (dashed lines) and provide a framework to support decision making under conditions that are uncertain and uncontrollable. Graphics adapted from Global Business Network (GBN).

### Climate Change Scenario Planning for DETO Cultural and Natural Resources

Climate-resource scenario development for DETO was a process of iterative engagement among the team's climate scientists and adaptation specialists, park and regional staff, natural and cultural resource planners, and other subject-matter experts. The following is a broad description of the process of developing and using robust DETO-specific climate-resource scenarios; a more detailed description can be found in the full scenario planning report (Schuurman et al. 2019). The process began with an orientation phase that preliminarily identified climate-sensitive priority park cultural and natural resources. Next, in a roughly seven-week phase that overlapped with and extended beyond the later stages of orientation, the team's scientists and adaptation specialists characterized the monument's past and current climate and the climate sensitivity of each identified resource by examining existing research and consulting park staff and other subject-matter experts.



Precise resource climate sensitivity characterization led into the third phase of the process (mid-December 2017–early March 2018)—developing climate futures. A climate future is a summary of down-scaled output from a single global climate model run for a given potential greenhouse gas emissions pathway that has been extracted for a specific location (see Schuurman et al. 2019 and Runyon et al. 2020 for details) and is therefore temporally and physically coherent and plausible, and park-specific. The climate futures focus on climate metrics that are relevant to the monument’s priority cultural and natural resources and to which people can easily relate. Developing the climate futures entailed first determining the appropriate climate metric to match each resource’s specific climate sensitivity based on scientific literature and expert input, and then using this information to select four climate futures that were sufficiently divergent to encompass the range of ways climate could change in coming decades in the monument.

In the final phase of the scenario development, climate futures were made relevant to management by comparing them to historical climate trends and weather events, then determining their consequences for resources in the context of other stressors. Park staff, other subject-matter experts, and climate adaptation specialists completed this in a scenario workshop in March 2018. They also began the iterative process of assessing the monument’s existing resource management strategies (i.e., goals and activities) in the context of these scenarios, and identified where it might be necessary to update strategies to ensure that goals are feasible under potential future climate conditions.

### **Integrating Scenario Insights into the Resource Stewardship Strategy Development Process**

Upon completion of the climate-resource scenario development step, in May 2018, the full project team participated in the first DETO RSS workshop. In this workshop, the team discussed both climate and non-climate key issues, stressors, and threats, identified the priority resources for the DETO RSS structure, identified and/or refined implications of the various plausible climate futures for the priority resources, and developed climate-smart stewardship goals for all priority resources (while being informed by the various climate scenarios).

Finally, during the second DETO RSS workshop in August 2018, at the latter stages of the RSS development process, this scenario-based analysis was operationalized by identifying climate change-informed resource stewardship activities for all priority resources. The ultimate intent of the identified stewardship activities is to fulfill the stewardship goals, or at least make progress on fulfilling these goals. In the months that followed the final RSS workshop, park staff worked to prioritize all identified stewardship activities by assigning a high, medium, or low priority status to each activity.

This pilot effort revealed that the RSS processes and the scenario process are highly complementary. The scenario process’ ultimate outputs—a structured understanding of resource implications across climate futures and an assessment of how resource stewardship goals and activities may need to be refined to remain feasible—are key inputs for the RSS development steps that establish climate-smart stewardship goals and activities to address key issues, stressors, and threats to the priority resources.





# PRIORITY RESOURCES

Priority resources drive the entire RSS process by focusing attention on those park resources that are critical and could most benefit from management direction within the next 3 to 5 years. Typically, the priority resources for a resource stewardship strategy may include those that are defined in a foundation document as fundamental or other important resources, as well as additional resources that park staff believes are necessary to maintain the monument's purpose and significance, address policy or legal mandates, or address scholarly and scientific research needs. Certain priority resources are standalone, while others may be subdivided into one or more components. The identification of priority resources and components guides the development of stewardship goals and activities in subsequent steps of RSS development. Parsing out the components of each priority resource helps resource managers tailor these goals and activities to more directly target the resource condition or understanding of its constituent parts. Collectively, this component-level stewardship works to improve the condition or understanding of the broader, "umbrella" priority resource. However, priority resource components were not identified for this DETO resource stewardship strategy because of the complexity of analyzing climate implications across multiple scenarios as well as across multiple components within each resource category. Instead, components are addressed in the stewardship activities for the priority resources

Below is a list of priority resources for the DETO resource stewardship strategy. Each priority resource is described in greater detail in a summary narrative that follows. These brief narratives provide additional information resource condition, relevant issues, stressors, or threats, and current management.

RSS Priority Resources for Devils Tower National Monument are:

## NATURAL RESOURCES

- Vegetation Communities
- Wildlife Communities
- Water Resources
- Geologic and Paleontological Resources
- Night Skies
- Natural Sounds
- Scenic Views
- Air Quality

## CULTURAL RESOURCES

- Historic Structures
- Cultural Landscapes
- Archeological Resources
- Sacred Sites, Traditional Uses, Ethnographic Resources
- History
- Museum Collections and Park Archives

## PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION



## PRIORITY RESOURCE SUMMARIES

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### NATURAL RESOURCES

**VEGETATION COMMUNITIES**— Devils Tower National Monument is located on the transition zone between the Northwestern Great Plains ecoregion and the Middle Rockies ecoregion. This unique location results in a diverse range of plant species in the monument, with the ponderosa pine woodlands and the mixed-grass upland meadows being the most predominant. Portions of the Belle Fourche River floodplain and riparian zone traverse the monument as well, which historically consisted of willow and cottonwood stands along the river. However, because of the effects of the upstream river impoundment at Keyhole Reservoir (and associated regulated water releases that disrupt floodplain processes) and the effects of climate change, the extremely limited regeneration of cottonwood trees and other woody riparian vegetation along the Belle Fourche riparian corridor is a very serious concern.

Overall, 17 vegetation associations have been identified at DETO. These include:

- Skunkbush Sumac / Bluebunch Wheatgrass Shrub Herbaceous Alliance
- Silver Sagebrush / Western-Wheat Grass Shrub Herbaceous Vegetation
- Green Ash - American Elm / Wolfberry Forest
- Eastern Cottonwood - Peach Leaf Willow / Narrow-Leaf Willow Woodland
- Little Bluestem - Grama (Side-Oats, Blue) - Threadleaf Sedge Herbaceous Vegetation
- Western-Wheatgrass - Blue Grama - Threadleaf Sedge Herbaceous Vegetation
- Prairie Cordgrass - Three-square Bulrush Herbaceous Vegetation
- Kentucky Bluegrass Disturbed Community
- Ponderosa Pine / Bur Oak Woodland
- Ponderosa Pine / Common Juniper Woodland
- Ponderosa Pine / Little Bluestem Wooded Herbaceous Vegetation
- Ponderosa Pine / Sun Sedge Woodland
- Ponderosa Pine / Oregon Grape Forest
- Ponderosa Pine / Bluebunch Wheatgrass Woodland
- Prairie Dog Town
- Phonolite Porphyry Sparse
- Redbeds Sparse Vegetation



The native vegetation communities at DETO face a variety of stressors. Climate change compounds, or multiplies, the effects of most stressors on the native vegetation. Ponderosa pine density and distribution increased substantially because of years of fire suppression and past cattle and sheep grazing in the area during much of the 19th and 20th centuries. Higher densities of ponderosas leave the woodland more prone to insect infestation (e.g., pine beetles) and crown fires. However, the ponderosa woodland density and structure generally appear to be similar to historical, pre-fire-suppression ponderosa densities and structure. Also, as noted, cottonwood regeneration is nearly non-existent along the Belle Fourche River because of the lack of natural river flood processes. Nonnative, invasive plants also threaten the native vegetation communities in the monument. Nonnative plants not only alter plant community composition and diversity, but also alter fuel dynamics and fire regime. While DETO has a rich diversity of native vegetation, the threat from invasives is always present. Kentucky bluegrass and leafy spurge are two of the more common nonnative, invasive species that threaten the monument's native plant communities.





**WILDLIFE COMMUNITIES**—Devils Tower National Monument is home to a diverse community of wildlife species, both terrestrial and aquatic. White-tailed deer, mule deer, and prairie dogs are some of the most common and iconic mammals seen at DETO. While deer are common throughout many areas of the monument, the prairie dogs are confined to the relatively stable, 30-40 acre colony in the southeastern portion of the monument. The deer populations are also considered stable, absent chronic wasting disease and other diseases.

The monument is home to one of the most diverse birding areas in the region because of the absence of land development and agriculture activities and because of the monument’s unique location between the prairie and montane ecoregions. The diverse ecosystems in the monument attract more than 160 species of birds to the monument throughout the year. Avian habitat includes the Belle Fourche riparian corridor (e.g., cottonwoods/willows), the prairie dog town that offers prey for raptors, the upsloping ponderosa pine woodlands, and even the rocky crags of Devils Tower that provide ideal nesting locations for raptors such as prairie falcons and peregrine falcons. The diversity and number of bird species at the monument peaks during spring/fall migrations and summer.

Amphibians and reptiles are also an important part of Devils Tower’s ecosystems. Most of the reptiles seen at DETO are snakes. Only one venomous species is present: the prairie rattlesnake. The most commonly seen reptile is the bull snake. These frequent the area around the Tower Trail, especially in early summer. Many reptiles, along with birds, mammals, and fish, prey on larval and adult amphibians. Amphibians, in turn, eat a variety of vertebrate and invertebrate species. Because amphibians are sensitive to disease, pollution, drought, variations in annual snowpack, and the arrival of nonnative species, they are important indicators of environmental change. Amphibian populations that are affected by one or more of these stressors may exhibit changes in their distribution or abundance. These changes can, in turn, have cascading effects on other aspects of the ecosystem.

The primary habitat for fish in DETO is the Belle Fourche River, and the many varieties of fish are also an integral part of the Devils Tower ecosystem. However, given the substantial alterations to natural hydrological processes of the Belle Fourche River (as noted in the “Water Resources” narrative), the future of the monument’s aquatic habitat and fish populations is seriously threatened. Changes to water quality that result from the upstream impoundment (regulated flows) and surrounding agricultural land uses (nutrient loading, sediment) will continue to stress fish populations, particularly in the wake of climate change (e.g., lower dissolved oxygen, high turbidity, high nutrient, and eutrophication).

Overall, aside from climate change effects (which can also compound non-climate stressors), wildlife at DETO are threatened or stressed by habitat fragmentation that results in smaller, severed tracts of usable habitat (within park, and at the regional scale); visitor recreation disturbances to wildlife behavior (foraging, nesting, migrating, etc.); invasive plants that reduce habitat and forage quality; wildlife diseases; and nonnative wildlife species, to name a few.



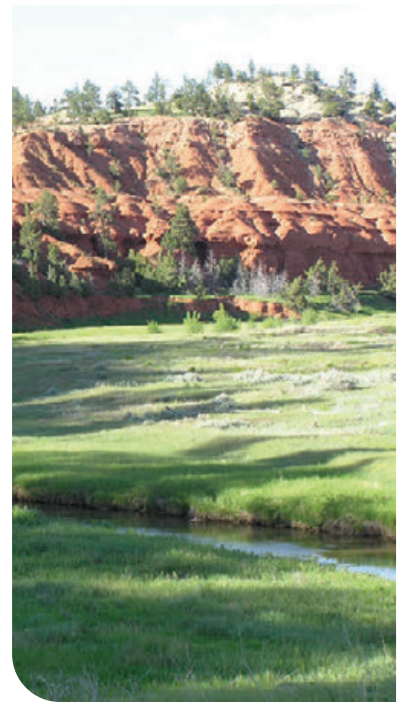


**WATER RESOURCES**—Approximately 2.3 miles of perennial stream (Belle Fourche River) and 1.1 miles of intermittent streams, as well as several springs based on the US Geological Survey's National Hydrography Dataset (NHD), exist within or adjacent to DETO. The Belle Fourche River is the primary hydrological feature at DETO. The river flows through the eastern portion of the monument and is part of the monument's southern boundary. In 1952, the Belle Fourche was impounded by the Keyhole Dam roughly 17 miles upstream of the monument. Since the dam's construction and operation, the Belle Fourche flow regime and floodplain processes through DETO changed substantially. The dam halted the natural seasonal flooding processes needed to sustain cottonwood regeneration along the riparian corridor. Aside from the effects on riparian vegetation regeneration, anecdotal observations indicate that Keyhole Dam has altered the characteristics of the river from a cold, clear, and fast-moving waterway into a warm, sluggish waterway with considerably higher turbidity and elevated levels of suspended solids.

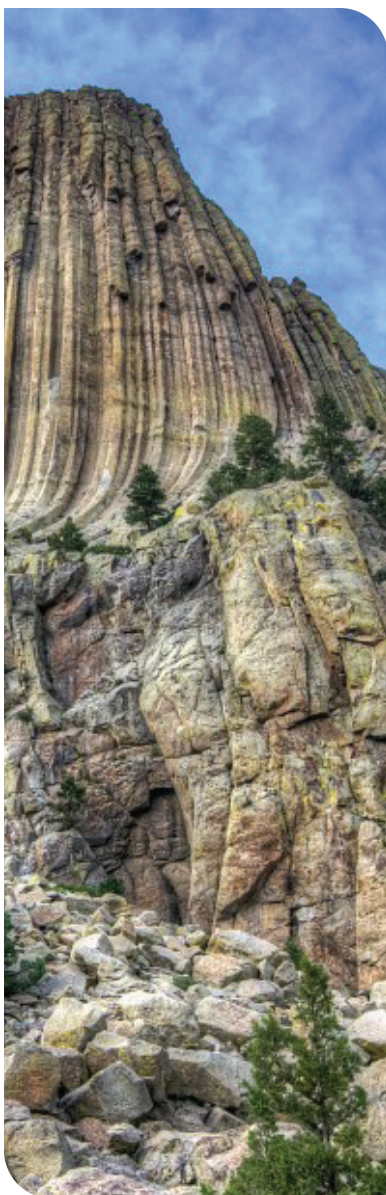
Per guidelines set forth by the NPS Water Resources Division (WRD), the long-term assessment of water quality at DETO focuses on several parameters, including: dissolved oxygen (DO), fecal coliform, pH, specific conductance, water temperature, and an estimate of flow. Aside from the substantial impacts of altered floodplain processes and regulated flow of the Belle Fourche, fecal coliform bacteria is another notable concern at DETO. In addition to the Belle Fourche exceeding WRD screening criteria for fecal coliform, the State of Wyoming has listed the Belle Fourche River (from the confluence with Arch Creek to Hulett) as impaired under section 303(d) of the Clean Water Act because of the fecal coliform levels.

Cattle grazing on surrounding lands outside park boundaries is a key issue that affects river conditions and water quality. Livestock from a number of surrounding private cattle ranches have direct access to the Belle Fourche River, and livestock are commonly viewed in the river or grazing along the riverbank. Cattle can negatively affect perennial and intermittent streams by causing erosion to banks, which introduces sediment loading (which increases turbidity) and increases nutrient loads (which can lead to eutrophication and associated algal blooms). Equally notable, cattle grazing in proximity to streams such as the Belle Fourche increases the probability of water contamination by fecal coliform bacteria.

Mineral development in the region can also affect water quality in park waters. Several active energy and mineral mining operations, as well as active coal-fired power plants, are located to the south and southwest of DETO near the upper reaches of the Belle Fourche River. Their close proximity to the Belle Fourche River increases the probability that water runoff containing heavy metals, and atmospheric deposition of air pollutants can enter the river and adversely impact water quality.







**GEOLOGIC AND PALEONTOLOGICAL RESOURCES**—The dominant geologic feature of DETO is obviously the tower. Given the significance of this feature to the monument’s creation, the tower formation is identified as a Fundamental Resource and Value in the DETO foundation document. American Indians of the northern plains hold the tower sacred, and they use the area for traditional and spiritual activities. Devils Tower is a world-renowned, steep-sided, igneous monolith that rises abruptly from the surrounding grasslands in the Black Hills. It is highly regarded for its primary geologic feature known as columnar jointing (polygonal columns). The tower’s columns are made from a shallow igneous rock that quickly cooled from the surface downward. DETO has near vertical columns in the upper portion of the tower but at the bench of the tower, just above the base, the columns flare out and some join together. The base of the tower is comprised of massive, irregularly shaped and poorly jointed columns, surrounded by talus and landslide material.

The tower is composed of igneous phonolite porphyry, which is more resistant to erosion than the surrounding sedimentary landscape. The tower’s shape and form is changing slowly over time because of the natural forces of erosion. However, recreational rock climbing has caused damage to the tower in the past and rock climbing has dramatically increased over the years. There are more than 220 climbing routes and hundreds of bolted anchors on the tower. Most of the routes are climbed using “traditional” methods where climbers place and remove their own protection as they climb. However, climbing activities such as bolting and trundling (rolling/pushing loose rocks off a climbing route) can damage or alter the rock face. Such damage has impacted the spiritual quality of the tower for many American Indians. Also, erosion of the tower can pose a threat to safety of park visitors, staff, and infrastructure.

In addition to the Devils Tower formation, paleontological resources have been documented in the Sundance Formation (Middle-Upper Jurassic) and the Precambrian-Mesozoic rocks in the talus and landslide deposits surrounding the tower. The Redwater Shale Member of the Sundance Formation contains marine fossils (ammonites, belemnites, and bivalves) at two sites within DETO. A reworked xenolith in the talus deposits at the monument contains a Carboniferous-age limestone that contains fossil fragments and brachiopods.

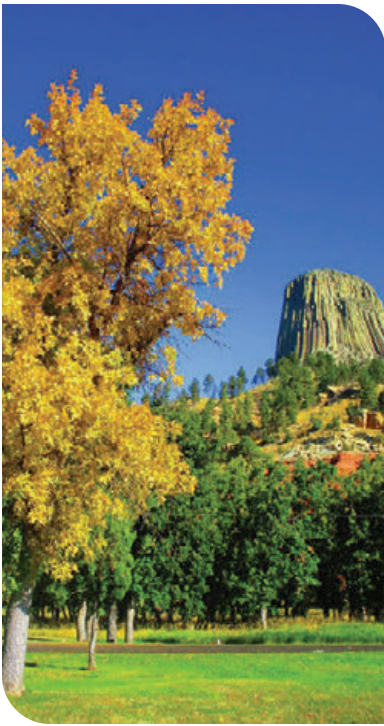
**NIGHT SKIES**—Pristine night skies are identified as part of the “Remote Setting” Other Important Resource and Value in the DETO Foundation Document. A lightscape is a place or environment characterized by the natural rhythm of the sun and moon cycles, clean air, and of dark nights unperturbed by artificial light (NPS 2007). Natural cycles of dark and light periods during the course of a day affect the evolution of species and other natural resource processes such as plant phenology. Several species require darkness to hunt, hide their location, navigate, or reproduce. In addition to the ecological importance of dark night skies, park visitors expect skies to be free of light pollution to allow star observation.

While the condition of the night skies at DETO is generally considered good, it is affected and threatened by several sources of anthropogenic light from near and far. The closest external sources of notable artificial light intrusion are the campground facilities near the monument entrance and the road lighting associated with the intersection of the monument access road and Highway 24. Artificial lighting associated with private land uses in the towns of Hulett (10 miles from the monument) and Sundance (27 miles from the monument) also contribute to the night sky degradation. The artificial light domes of Moorcroft, Gillette, Rapid City, and Spearfish can also be seen from the monument. Aside from these impacts, lights from mining and other large, intensive land use operations are a threat to the night skies.

Additionally, lighting associated with park facilities, park housing, and other operations may contribute to light pollution. However, light pollution mitigation has been applied to help minimize these internal effects.







**NATURAL SOUNDS**—Natural soundscapes are identified as part of the “Remote Setting” Other Important Resource and Value in the DETO Foundation Document. Visitors at DETO can hear diverse natural sounds that not only enhance visitor experience but also serve a critical ecological role. For example, wildlife depend on hearing natural sounds in the environment for a range of activities, including communication, establishing territories, courting and mating, raising families, finding food, and avoiding predators.

The condition of the natural soundscape at DETO is relatively good because the sound levels remain in the quiet comfort level range most of the time. However, noise pollution (sometimes very loud levels of noise) occasionally degrade the monument’s soundscape. Various non-natural sounds can be heard at DETO, such as external land use operations, trail use by visitors, traffic noise on internal and external roads, and aircraft overflights. Most notably, DETO’s natural soundscape has been diminishing over time primarily from increasing frequency of military and civilian aircraft overflights, and increasing visitor congestion and vehicular traffic (internal and external). The opening of the Hulett Airport and the expansion of the Powder River Training Complex by the US Air Force have resulted in a significant increase in overflight noise disturbances at DETO. This increase in overflight noise has also become a much more persistent disturbance. Likewise, during the Sturgis Motorcycle Rally in August, loud motorcycles become a significant stressor to the soundscape of the monument.



**SCENIC VIEWS**—Uninterrupted scenic views both of and from the tower are identified as part of the “Remote Setting” Other Important Resource and Value in the DETO Foundation Document, which highlights the importance of this resource. Scenery is composed of visual resources, which are the visible physical features such as topography and landform, vegetation, water, structures, and other features that combine to create the visual landscape. Because the scenic views to and from the monument encompass features and landscapes both inside and outside the monument boundary, visual obstructions and land development both inside and outside the monument can degrade scenic views. Iconic views of Devils Tower from several vantage points beyond park boundaries are important elements of this resource. Likewise, the iconic views of the expansive Northern Great Plains landscape as seen from within the monument are equally valuable.

Current vistas from DETO range from nearly pristine to somewhat modified by the existence of roads and land development visible from various viewpoints, including views of the monument entrance area. Based on air quality data, vistas are also diminished by haze caused by fine particles in the air. Long range views beyond park boundaries are especially affected by air pollution. In general, the scenic views of DETO are most threatened by external stressors, including road development, private land development around the monument (both near and far), mining operations and disturbances, and air pollution.



**AIR QUALITY**—Clean air enhances the color and contrast of the monument’s landscape features, allows visitors to see great distances, enhances views of the wide open expanses and night skies, and contributes directly to ecosystem, visitor, and staff health. According to NPS Air Resources Division methods, overall air quality is in fair condition. The condition is based on interpolated data from air quality monitors outside the monument and is a combination of air quality indicators for visibility, ozone human health, ozone vegetation health, and pollutant deposition including nitrogen, sulfur, and mercury. DETO visibility was relatively unchanged between 2012 and 2017, the most recent period analyzed, and is the only trend available because of distance of other air quality monitors. Overall air quality at nearby Wind Cave National Park is also relatively unchanged, a possible indication of overall unchanging air quality at DETO.

Without the effects of pollution, visual range is between 120 and 200 miles. However, scenic views are diminished by pollution-caused haze, reducing visibility to between 60 and 150 miles. At night, particulates also scatter artificial light, increasing the impact of light pollution to the night skies. The semi-arid ecosystem at DETO is highly sensitive to nitrogen-enrichment effects where estimated total nitrogen deposition is above critical loads for some park vegetation, suggesting that lichen, herbaceous, and forest vegetation are at risk for harmful effects. The nutrient enrichment effects of excess nitrogen deposition can help invasive plant species grow faster (including cheatgrass) and out-compete native vegetation adapted to lower nitrogen condition. Airborne contaminants, including mercury and pesticides, can deposit and accumulation in organisms leading to reduce foraging efficiency, survival, and reproductive success.

Regional emission sources that contribute to air pollution in the park include oil and gas production, coal-fired power plants, vehicle exhaust, agricultural activities, smoke from fires, solvent use, coal mining, and unpaved road dust. Since 2000, emissions from power plants in the region have decreased by more than 50% for the protection of nearby class I areas, including Wind Cave National Park. However, emissions from extensive oil and gas development in the nearby Powder River Basin and Denver Basin are likely to increase in the future.



## CULTURAL RESOURCES

**HISTORIC STRUCTURES**—The two primary building periods are represented in the monument, the NPS Rustic style of the Civilian Conservation Corps (CCC) era and the Park Service Modern style of the Mission 66 program. All pre-1950 structures have been recorded and evaluated, and six are listed in the National Register of Historic Places (NRHP): four CCC-era buildings, the Entrance Road (built 1917) with its CCC-era culverts, and the “tower ladder” constructed in 1893 for a publicity stunt (see History overview). The Entrance Road winds up and around half the monument and connects the Entrance Station to three CCC-era structures near the tower, which comprise the Old Headquarters Area Historic District.

The four listed buildings are mostly in good condition as of 2005. The Entrance Road is in overall good condition, but a few of its culverts are fair or poor and need treatment. The monument is attempting to add the road and culverts to the scope of an upcoming Historic Structure Report update for the four CCC-era structures. The tower ladder is in poor condition and continues to deteriorate. It was last maintained in 1972, and a second round of restoration is in planning. A Vanishing Treasures crew conducted a condition assessment in July 2018 and treatment recommendations are forthcoming.

The Mission 66 program creates a unique management challenge: these are not just individual contemporary historic buildings, but a comprehensive, designed building program on the landscape. For this reason, the collective development including roads, structures, and associated resources must be evaluated and maintained as a group as well as individual architectural units. None of these approximately 18 structures have been recorded, NRHP evaluated, or had their condition assessed. In the meantime, DETO staff correctly treat all of the structures as NRHP-eligible pending a formal consensus Determination of Eligibility. This set of Mission 66-related projects is the monument’s most critical cultural resources program need.





**CULTURAL LANDSCAPES**—Devils Tower National Monument is described in its Foundation Document as a “*landscape-level ethnographic resource*.” The tower is a sacred place to many American Indian tribes, and the landscape abounds with evidence of ancient and ongoing spiritual activity.

This ethnographic landscape is one of four cultural landscapes that have been tentatively identified, but none of them has been documented, evaluated, or assessed for condition and to enhance resource management and park decision making. The others are the Tower Trail and Red Beds Trail, the Entrance Road and Old Headquarters Area, and the Mission 66 Administrative Area and Campground landscapes. The entrance road is listed on the National Register of Historical Places as an individual structure with 20 contributing CCC-era culverts.

The highest priority for cultural landscape management is the Mission 66 Administrative Area and Campground. Mission 66 resources have not been documented or evaluated at any level, as individual structures, a historic district, or a cultural landscape. The Tower Trail and Red Beds CLI has been in development since 2019. A cultural landscape treatment plan for this cultural landscape is a priority since it is the highest-use area in the monument. The monument-wide ethnographic landscape could possibly be documented as an interdisciplinary project in conjunction with the regional cultural anthropology program and in collaboration with associated American Indian tribes.

**ARCHEOLOGICAL RESOURCES**—Evidence of prehistoric activity at Devils Tower goes back to the Paleo-Indian period. A complete chronology for the monument cannot be reconstructed from known sites, but the regional chronology is generally known from research in surrounding areas.

The monument manages 70 documented archeological sites, although erosional processes have revealed many new ones since the last comprehensive surface survey in 1998 so that regional archeologists believe there could be upwards of 200 sites. A more refined understanding of both documented and undocumented sites could answer important research questions related to specific activities at the tower such as the seasonality of occupation, siting significance, etc.

Lithic scatters account for almost all documented prehistoric-era sites and two-thirds of documented sites overall. A few of these are bisected by the CCC-era Tower Trail. These sites are important to archeologists for their data potential and important to associated tribes as remnants of their ancestors’ activities. Aside from the lithic scatters are a hearth and two rock art panels on the tower granite, the latter of which are difficult to discern and consist of amorphous red ochre pigment.

The historic era is represented by the pre-CCC Graham Cabin site (no standing structural elements); five graffiti panels, mostly on sandstone outcrops (1876–1930); miscellaneous CCC-era remnants (trash dump, river control features); the Thurman’s Café and cabins site (1930–1965, structures removed after 1965); and various trails, some abandoned and some maintained. There are no standing ruins in the monument.



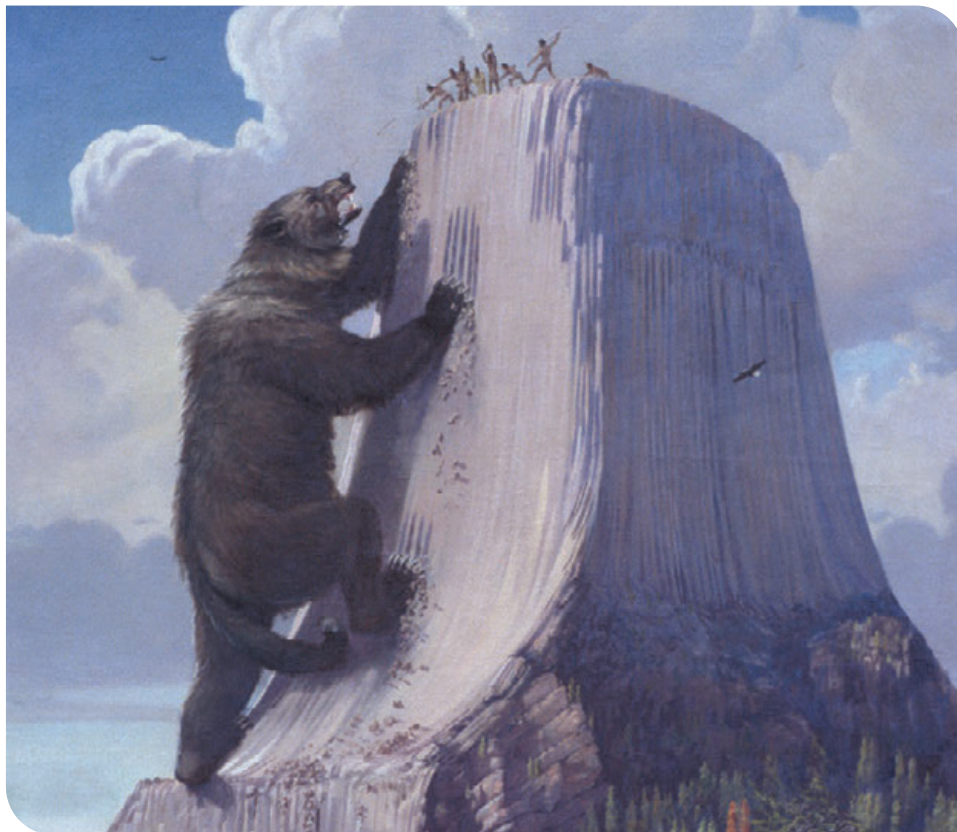


**SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES**—For thousands of years, American Indian tribes in the region have celebrated the Tower in their stories—many call it Bear’s Lodge or a variation on that theme—and have traveled there for spiritual purposes. In Lakota cosmology, Bear’s Lodge is closely connected with Wind Cave located less than 100 miles away in southwestern South Dakota. Signs of ongoing spiritual practice are evident across the monument, and for this reason it is treated as a landscape-level ethnographic resource. “*American Indian Spiritual Values and Opportunities for Personal Reflection*” is identified as a fundamental resource and value in the 2014 foundation document.

The monument has 26 associated tribes, and although its ethnographic landscape has not yet been formally documented, it is managed in regular consultation with tribal partners. No other Traditionally Associated Peoples have been identified, but neither have there been studies to determine whether any non-tribal groups should be characterized as such. Ranching is an important traditional lifeway elsewhere in the region, and early local settled communities had some pre-monument traditions at the tower such as the Old Settlers’ Picnic, which traces its origins to a gathering for a publicity stunt in the summer of 1893.

A field inventory conducted in 1993 and eventually published as an Overview and Assessment (Hanson and Chirinos 1997) remains a valuable document. Based on this document, the “Devils Tower and the surrounding traditional use areas” were determined to be eligible for listing in the National Register of Historic Places. The Tower Trail has also been identified as a Traditional Cultural Property boundary in a Multiple Property Documentation Form signed in July 2000.

It is significant to note that, in the time since Hanson and Chirinos’s 1997 survey, evidence of traditional spiritual practice has become far more common and visible, so that whereas personal offerings (e.g., prayer bundles, prayer cloths) were considered remarkable in 1993, they are now ubiquitous (Rogers 2008).



**HISTORY**—Devils Tower is America’s first national monument, created in 1906 by President Theodore Roosevelt under the newly enacted Antiquities Act. The Tower was within lands ceded to the Sioux Tribe by the Fort Laramie Treaty of 1851 but was outside of the Great Sioux Reservation established by the revised treaty of 1868. Recognizing its uniqueness, the General Land Office denied its preemption under the Homestead Act in response to a claim by Charles Graham in 1890. Interest groups helped keep the land undeveloped, with the exception of the unfinished cabin site that Graham built hoping to “prove up” his claim. Graham’s cabin is now a mostly subsurface archeological site.

For thousands of years, American Indians had been drawn to the tower as a place of spiritual importance. White settlers, arriving in significant numbers starting in the late 1880s, were in turn drawn to it as a natural wonder and the tower quickly became a popular destination for local picnickers and campers. In 1893 two local ranchers climbed to the summit using a hand-built ladder (remains of this “tower ladder” are managed as a historic structure). Their Fourth of July stunt drew around 800 people, and local gatherings at the tower in late June or early July remained a tradition that in 1932 was organized into the Old Settlers’ Picnic. This tradition continued for decades, and the monument hosted a revival of it during centennial celebrations in 2006. From the 1930s onward, the tower saw increasing numbers of tourists, weddings on its summit, a stranded parachutist, more recreational rock climbers, and the filming of a Steven Spielberg movie.

The 1990s marked a turning point for management as a result of two developments that came to a head. Whereas American Indian interest in the tower as a spiritual place never waned, they generally avoided a strong visual presence at the monument, partly for secrecy but also because of discouragement from local communities. However, starting in the mid-1980s and especially by the early 2000s, signs of private spiritual practice became much more common, and some traditional communal practices such as the Sun Dance were revived for a time. During this same period, the popularity of recreational rock climbing blossomed: 312 climbers registered in 1973 compared to 5,000 annually in the 1990s. A conflict arose between tribal members who considered it sacrilege to climb the sacred tower and rock climbers who saw the tower as a public geologic feature with world-famous crack climbing. The monument explored the issue and implemented its first Climbing Management Plan in 1995, which was largely upheld after a group of climbing guides filed suit, claiming the plan was unconstitutional. The development of this controversy is covered in the current Administrative History (Rogers 2008). Managing the tower both as an important spiritual place and as a climbing destination has been a success but remains one of the monument’s biggest challenges.







**MUSEUM COLLECTIONS AND PARK ARCHIVES**—The monument collection includes 38,475 objects, over half of which are archeological, and which also include historical, ethnographic, and art objects, as well as biological, paleontological, and geological specimens. The objects are curated in nine facilities: two facilities at Mount Rushmore National Memorial (MORU), Western Archeological and Conservation Center (WACC) in Tucson, Midwest Archeological Center (MWAC) in Lincoln, and five non-federal repositories. There are no known museum objects remaining at the monument itself since the last was removed in January 2017, although unaccessioned archival materials were discovered there during an archives survey in July 2018. Approximately 97% of known collections materials are cataloged, but perhaps two-thirds of catalog records lack information in core fields. Improving these catalog records as well as accession records is critical for accountability and for making information about the collections available to the public.

MORU curates 34% of the monument’s collection. Catalog records for all of the collection objects, regardless of location, are managed by a museum specialist there who also handles the monument’s reporting requirements. This arrangement works well and should be sustained.

MWAC curates 64% of the monument’s collection, WACC curates some archival materials, and the rest is curated in non-federal facilities. This includes plant samples and small mammal tissue samples at the University of Wyoming (two separate facilities), University of Minnesota, and Colorado State University.

DETO has partnered with the Hulett Museum and Art Gallery and loans objects on a recurring basis for its Devils Tower display. These objects are related to the monument’s more recent history and include a National Park Service sign, two wooden stakes from the 1893 tower ladder, and rock climbing equipment used during early route-setting ascents by famous climbers Fitz Wiessner and Jack Durrance (see Rogers 2008, Chapter 4, for a history of pioneering rock climbers at Devils Tower).

Among the most critical needs for the museum collection are condition assessments. Catalog records indicate that nearly 70% of the museum collection is in good or better condition, but most of these assessments have not been revisited since they were originally completed. A comprehensive CCS is needed to determine the actual situation. Another critical need is preventive conservation strategies. The monument should work with its curation partners to develop museum checklists for its non-federal repositories and to improve preservation and preventive care processes and documentation at MORU and MWAC. Finally, the monument should consider implementing one of its key objectives stated in the Collection Management Plan (CMP), which is to make collections more accessible for research and interpretation by internal and external parties using a variety of online and real-world platforms. This work should include natural history collections currently held at universities as well as the federally curated cultural resource collections.






**PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION**—This priority resource category was created to assist resource managers in tracking cross-resource or “parkwide” goals and stewardship actions concerning essential resource-related information that is not specific to any one priority resource but addresses several natural and cultural resources in the monument. Moreover, climate change information is identified specifically in this priority resource because of the additional emphasis afforded through the climate change scenario planning undertaken for this resource stewardship strategy.









# KEY PARK ISSUES, STRESSORS, AND THREATS

Devils Tower National Monument faces a variety of issues, stressors, and threats that affect monument resources or may potentially affect monument resources in the future. These include factors that are related to climate change and those that are unrelated. Key issues are management concerns that directly relate to monument resources and their conditions. Stressors are factors that exacerbate change in resource conditions, while threats are immediate or potential factors that may negatively impact monument resources in the future but do not currently affect monument resources. The identification of key issues, stressors, and threats helped drive the selection of priority resources for this resource stewardship strategy. Furthermore, the National Park Service considered key issues, stressors, and threats when setting stewardship goals for priority resources and when developing and prioritizing stewardship activities that respond to those goals.

Understanding the climate change-related key issues, stressors, and threats, and their specific implications for the priority resources is an important step in integrating climate scenarios into the RSS process because this information will become the basis for developing or refining appropriate and meaningful RSS goals and activities that respond to those issues, stressors, and threats. Although climate change implications are already often considered as one type of stressor or threat to monument resources in the standard RSS process, climate-resource scenario integration in this RSS process included an additional step for organizing the implications of these climate stressors and threats under each plausible climate future.

The key issues, stressors, and threats that do not directly involve climate change (i.e., non-climate key issues, stressors, and threats) and their implications for the priority resources were analyzed and identified below. A separate analysis of the key issues, stressors, threats, and implications of the four divergent climate futures on each priority resource is shown in Tables 1a – 1n.

## NON-CLIMATE KEY ISSUES, STRESSORS, AND THREATS

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### VEGETATION COMMUNITIES

- Emerald ash borer
- Lack of flooding (which substantially limits riparian tree regeneration)
- Invasive, nonnative plant infestations
- Fragmented vegetation communities (internal and external to park)
- Ground disturbances (internal and external to park)
- Fire management and suppression
- Mountain pine beetle
- Other forest pests
- Air pollution: elevated ozone, excess nitrogen deposition
- High browsing rates by deer and other wildlife
- Social trailing by visitors
- Location of monument near range limit some species
- Decline in pollinators

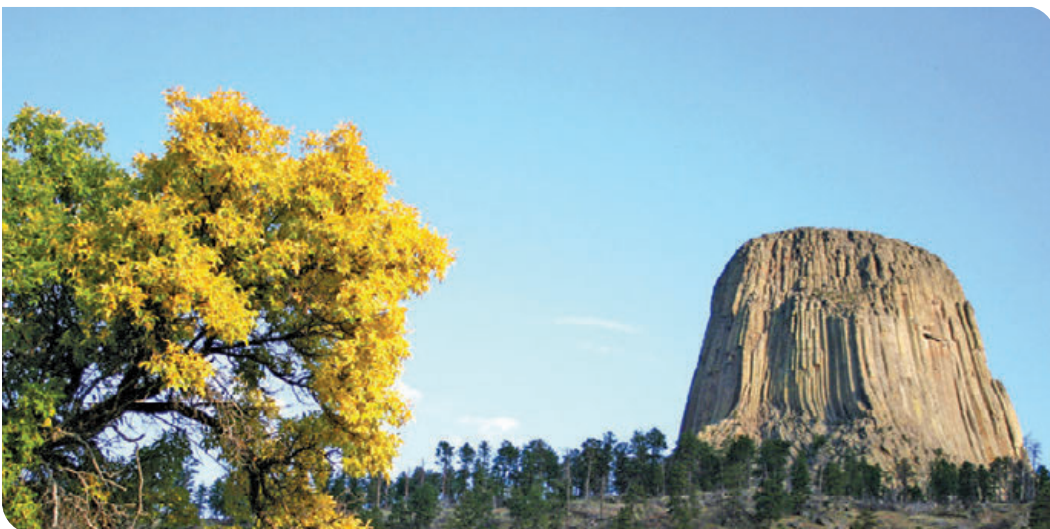


## WILDLIFE COMMUNITIES (AQUATICS, TERRESTRIAL)

- Wildlife diseases
- Amphibian declines from fungus
- Air pollution: excess mercury deposition contamination
- Lack of natural predators (e.g., deer overpopulation)
- Decline in pollinators (external)
- Fencing effects on wildlife movement
- Prairie dog inbreeding due to small population
- Climbing disturbances to raptors, bats, and other mammals
- White-nose syndrome in bats
- Feral cats and invasive animals
- Wildlife habituation and diet effects from visitors feeding
- Wildlife behavior disturbances from photographers
- Springs drying up affecting wildlife habitat value
- Causes of porcupine decline
- Road mortality
- Noise impacts to wildlife behavior from vehicles and motorcycles
- Military overflights and helicopters/drone noise impacts on wildlife
- *E. coli* in river affecting aquatic wildlife
- Edge of habitat range limits viability for communities/species

## WATER RESOURCES

- Keyhole Dam impacts to river flow regime
- Poor river water quality (*E. coli*, turbidity, and possibly other parameters)
- Altered spring flows from internal monument development/infrastructure
- Groundwater and surface water withdrawals for a variety of external uses (e.g., energy development) and potential effects on both monument natural resources and internal water supply
- Stormwater drainage and related erosion issues at particular sites
- Monument infrastructure (road and parking lots) alters local hydrology and river dynamics



## **GEOLOGIC AND PALEONTOLOGICAL RESOURCES**

- Erosion of paleontological resources
- Potential for vandalism, theft of paleontological resources (unknown)
- Ongoing geohazard and rock fall issues
- Increases in climbing may be increasing rock fall
- Climbing anchor replacement impacting tower rock
- Climbing increases rock polish (anthropogenic)
- Graffiti and vandalism on sandstone cliffs
- Theft of tower rock
- Potential for rare element resource mining project in surrounding US Forest Service land (Black Hills NF)
- External energy development outside the monument
- Known paleontological resources and new discoveries in the monument receive only limited management and data collection

## **NIGHT SKIES**

- Lighting related to private development at the monument entrance (KOA, etc.)
- WYDOT lighting at intersections at 24/110 and 24/14
- Lighting from Town of Hulett and neighboring cities
- Monument lighting at visitor center, administration buildings, staff housing, amphitheater
- Lighting from large external developments, such as oil/gas and other mining/etc.
- Lighting from large neighboring commercial operations (e.g., lumber mills)
- Air pollution particulates that scatter artificial light

## **NATURAL SOUNDS**

- Tour buses
- Large vehicles
- Motorcycles
- Generator use in both the NPS and neighboring private campgrounds
- Special events on neighboring lands
- Climbers yelling
- Military overflights and helicopters/drone
- Mill noises
- Cattle
- Visitor noises, particularly at campground
- Log truck engine brakes
- External oil/gas development and mining
- Gunshots from hunting
- Private development at park entrance
- Nonnative bird noises (pigeons)

## **SCENIC VIEWS**

- Commercial development at the monument entrance is highly visible and negatively impacts internal and external views
- External development and commercial traffic related to mineral, energy, and urban development has a negative impact on external views
- Internal monument developments (trails, pavilions, etc.) that alter views inside the monument
- Air pollution caused haze reduces visual range from 165 to 100 miles on average
- Fires altering surrounding/distant landscape in external views
- Ponderosa pines blocking historic internal views from tower trail
- Invasive plant species

## **AIR QUALITY—Air pollution emission sources including:**

- Oil and gas production
- Coal-fired power plants
- Vehicle exhaust
- Agricultural activities
- Smoke from fires
- Consumer and commercial solvent use
- Coal mining
- Dust from unpaved roads

## **HISTORIC STRUCTURES**

- Stormwater run-off issues near the Visitor Center, compounded by freezing drains, can undercut building foundations
- CCC-era stone culverts are deteriorating from run-off and erosion
- Lack of historic documentation (particularly for Mission 66 structures) inhibits their historical understanding and monument's ability to address their functional needs in a timely manner
- Historic Visitor Center visitation is far over-capacity (max occupancy is 49, and it exceeds this in the summer), which increases wear and tear on the structure
- Insufficient defensible space around historic structures makes them vulnerable to wildland fire
- Insect damage to historic fabric
- Mice, bats, and other small mammals cause minor damage to some historic structures, such as nesting and burrowing
- River flooding occurs (often forms ice dams), affecting historic structures and roads
- Lack of cultural resources staff affects the monument's ability to respond to key stressors and threats



## **CULTURAL LANDSCAPES**

- Stormwater run-off issues near visitor center (compounded by freezing drains)
- CCC stone culverts deteriorating
- Lack of landscape documentation
- Insufficient defensible space around historic structures
- Insect damage
- River flooding occurs (often from ice dams), affecting historic structures and road
- Lack of cultural resources staff affects the monument's ability to respond to key stressors and threats
- Invasive plants and vegetation change

## **ARCHEOLOGICAL RESOURCES**

- Off-trail visitor use can result in the inadvertent trampling of archeological sites
- Outdated archeological survey information (lack of information) impedes resource management
- Natural erosion occurring around archeological sites, including deteriorating pictographs
- Prescribed fire and vegetation changes can alter the archeological sites near them
- Historic graffiti is susceptible to natural erosion
- Lack of cultural resource staff affects the monument's ability to respond to key stressors and threats, including the monument's ability to maintain current records and documentation and provide archeological resource monitoring
- The monument staff do not know whether illegal collection is happening
- Eroded archeological sites that become more exposed are vulnerable to the potential threat of illegal collection

## **SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES**

- Increasing or changing patterns in fires and fire danger limits traditional uses (fires, sweat lodges)
- Increases in requests for plant collection could lead to collection that affects vegetation communities
- Visitors climbing the tower and the local community's lack of understanding and acceptance of the monument area as a sacred site stresses site values and the monument's tribal relationships
- Lack of staff devoted to tribal relations and visitor compliance can negatively impact the monument's management of sacred sites, traditional uses, and ethnographic resources
- Unresolved tensions among tribal and community members concerning the history of the national monument's designated name can affect the monument's tribal relationships
- Artificial lighting after dusk degrades cultural resource values (also see the Dark Night Sky priority resource, above)
- Tribal members have concerns about their ability to have privacy when conducting traditional cultural ceremonies in certain locations in the monument

## **HISTORY**

- A lack of documentation of oral history from non-tribal individuals (ranchers, other locals) impedes the understanding and management of these resources
- Park history collections, including the monument's climbing history, are not consolidated and can be cumbersome or difficult for park staff and the public to access
- Lack of interpretation of historic uses diminishes visitor understanding of their importance in the monument

## **MUSEUM COLLECTIONS AND MONUMENT ARCHIVES**

- Lack of museum collections stored onsite due to the lack of a storage structure with appropriate indoor climate conditions results in the inability to display or provide access to them in the monument for the benefit of visitor and park staff
- Resource and administrative history information reports, and some spatial data, are not organized into manageable data system to facilitate their use by park staff
- Existing park files or other items that warrant relocation to the museum collection have not been surveyed

## CLIMATE SCENARIO-RELATED STRESSORS AND POTENTIAL IMPLICATIONS

This section presents implications of the four divergent climate futures, in a table for each priority resource (tables 1a – 1n), and closely match table 6 in Schuurman et al. 2019. Each table also identifies implications common to all or most scenarios in its right-most column, and highlights (in yellow) highly consequential implications unique to half or fewer scenarios (see discussion in Runyon et al. 2020).

**Table 1a. Climate Scenario-Related Stressors and Potential Implications for Vegetation Communities**

*Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY) IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Increased productivity</li> <li>- Decreased fire risk and prescribed fire more difficult</li> <li>- More pine, maybe more species of conifers (increased spruce)</li> <li>- Thick stands increase Mountain Pine Beetle risk but trees are less susceptible</li> <li>- Oaks increase but disease/pests increase?</li> <li>- Cottonwoods happy</li> <li>- Ash trees extirpated by emerald ash-borer (EAB) Ethnographic plants increase growth but may be outcompeted by exotics</li> <li>- Cool-season invasives happy</li> </ul>	<ul style="list-style-type: none"> <li>- Increased productivity b/c of spring rain</li> <li>- Increased fire risk in fall b/c of spring growth and dry fall</li> <li>- Pine mortality risk is lower</li> <li>- MPB risk is lower</li> <li>- Oaks do OK</li> <li>- Cottonwood recruitment decreases less, less flooding</li> <li>- Less change to native plants in this scenario</li> <li>- Cool season invasives love this</li> <li>- Overall, relatively good for natives; possible increased fire but increased cool-season invasives</li> </ul>	<ul style="list-style-type: none"> <li>- No change in productivity?</li> <li>- Increased fire</li> <li>- Decreased ponderosa establishment and survival in fires</li> <li>- MPB decreases with decreased tree density but trees are stressed</li> <li>- Oaks decrease due to summer drought</li> <li>- Cottonwoods same or worse</li> <li>- Ash trees extirpated by emerald ash-borer (EAB)</li> <li>- Native plants and traditional plants OK (many are drought-tolerant)</li> <li>- Cool-season invasives happy again</li> <li>- Phenology mismatch increases because of variation in green-up (warm temps in winter)</li> <li>- Highly favorable for cheatgrass</li> </ul>	<ul style="list-style-type: none"> <li>- Decreased productivity</li> <li>- Increased fire, more drought so less fuel. Long fire season</li> <li>- Ponderosa decreases due to drought</li> <li>- MPB increased, trees are stressed but fewer trees</li> <li>- Oaks potentially disappear with drought</li> <li>- Cottonwoods do poorly</li> <li>- Native plants/traditional plants decrease</li> <li>- Cool-season invasives do poorly</li> </ul>	<ul style="list-style-type: none"> <li>- Cool-season invasive species increase (3 of 4) and/or suite of invasives changes</li> <li>- Increased fire risk season - long and lengthened fire season challenges ability to conduct prescribed burns, which impacts management influence on ponderosa pine susceptibility to drought, MPB, and wildfire</li> </ul>



**Table 1b. Climate Scenario-Related Stressors and Potential Implications for Wildlife Communities***Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Increased bats, aquatic life , land-snails, and amphibians</li> <li>- Increased Chytrid, decreased frogs</li> <li>- Increased herbivores: rodents and ungulates</li> <li>- Birds—decreased nest success, but good insect prey</li> <li>- Zoonotic and wildlife disease: West Nile, Tularemia, insect-vectors</li> <li>- Phenotypic mismatch</li> <li>- Increased sediment leads to biocontaminants in prey (ag. nutrients and decreased runoff)</li> <li>- Slug invasion?</li> <li>- Possible change in pollination</li> <li>- More ice-free days at springs/wetlands (benefit for wildlife)</li> </ul>	<ul style="list-style-type: none"> <li>- Overall, good for amphibians and birds, not good for mammals</li> <li>- Potential increase in amphibians due to increased water, but note that Chytrid would likely increase as well</li> <li>- Increased nest success due to fewer heavy (&gt;1") precip. events</li> <li>- Increased risk of hemorrhagic disease outbreaks due to midges increase with increased wet, increased temps, decreased days &lt;32F</li> <li>- Increased flea and tick population due to increased precip. in spring = increased plague, tularemia</li> </ul> <p>Phenological mismatch for migratory birds and insect hatches</p> <ul style="list-style-type: none"> <li>- Possible change in pollination More ice-free days at springs (compared to historical, but least relative to the other scenarios) = benefit to wildlife</li> </ul>	<ul style="list-style-type: none"> <li>- Insects would do well – including pest species</li> <li>- Increase in reptiles</li> <li>- Forage/browse quality reduced</li> <li>- Less prey for raptors, mesocarnivores, and snakes</li> <li>- Increase or decrease in fires depending on intensity and frequency</li> <li>- Phenological timing/ mismatch migration</li> <li>- If shoulder-season climbing increases, disturbance to overwintering bats would increase if results prove the bats to be there</li> <li>- Possible change in pollination</li> <li>- Earlier releases from dam, increased water temp and decreased flow in river = decreased dissolved oxygen (DO) (fish kill?)</li> </ul> <p>Prairie dog towns expand in drier conditions</p>	<ul style="list-style-type: none"> <li>- Amphibian habitat declines, potential population declines</li> <li>- Peregrines do well</li> <li>- Increased prairie dog diseases (but favorable winter condition)</li> <li>- Reduced forage quality</li> <li>- Porcupines may suffer from fires – no food</li> <li>- Insect and disease increases</li> <li>- Landscape-level habitat changes – higher variability in herbivore habitat occupancy</li> <li>- Phenological mismatch</li> <li>- Possible change in pollination</li> <li>- Low DO in river could increase aquatic species mortality and alter species composition</li> </ul> <p>Prairie dog towns expand in drier conditions</p>	<ul style="list-style-type: none"> <li>- More ice-free days at springs/wetlands (benefit for wildlife)</li> <li>- Increased river water temperatures would alter aquatic species composition</li> <li>- Altered species assemblages</li> <li>- Phenological mismatches (migratory birds, insects, and plants)</li> <li>- Increased disease risks across species/diseases</li> <li>- If shoulder season climbing and other visitor use increase, disturbance to overwintering bats would increase</li> </ul>

**Table 1c. Climate Scenario-Related Stressors and Potential Implications for Water Resources**

*Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Increased flooding throughout the monument</li> <li>- Increased rain-on-snow events in early spring</li> <li>- Decreased H2O quality from contaminants and turbidity</li> <li>- Increased erosion along storm water drainage (culverts washing out, etc.)</li> <li>- Flooding exacerbated by inadequate culvert size</li> <li>- Increased spring flow</li> <li>- Increased spring flow seasonality (those that dry and occasionally may not)</li> <li>- Wetlands expand</li> <li>- More ice-free days at springs/ wetlands</li> <li>- Tarpot Spring—where the water now sinks (meadow west of housing area), it would flow above ground toward river and affect infrastructure</li> <li>- Increased river flood frequency/ intensity</li> <li>- Increased river bank erosion (river bank is park boundary in places)</li> <li>- Increased releases from dam into river</li> </ul>	<ul style="list-style-type: none"> <li>- Potential impacts from increased energy development (decreased spring flow and/or decreased park H2O supply) – however, this is speculative</li> <li>- Decreased water quality from urban and agricultural runoff</li> <li>- Earlier snow melt</li> <li>- Graham Spring could dry up in late summer/fall</li> <li>- More ice-free days at springs (compared to historical, but least relative to the other scenarios) = benefit to wildlife</li> <li>- Reduced flow in springs in late summer/fall</li> <li>- Increased flood frequency – Belle Fourche River</li> <li>- Potential increased river bank erosion (note: park boundary is river bank – loss of acreage as bank erodes)</li> </ul>	<ul style="list-style-type: none"> <li>- Possible HAB (harmful algal bloom) occurrence in springs or river</li> <li>- Dry conditions – negative on amphibians and aquatic inverts</li> <li>- Increased runoff events and erosion during the extreme precip events (from drier soil, &lt; veg)</li> <li>- Wetland retreat at Tarpot Spring</li> <li>- Ice-free in winter at Tarpot Spring</li> <li>- Graham Spring could be dry in fall and summer</li> <li>- Decreased water quality in springs and wetlands</li> <li>- Potential for ice-free conditions year round on Belle Fourche River</li> <li>- Earlier releases from dam, increased water temp and decreased flow in river – decreased DO (fish kill?)</li> <li>- Decreased water quality in river</li> <li>- Declining groundwater table with resulting effect on monument wells</li> </ul>	<ul style="list-style-type: none"> <li>- Decrease in flooding relative to climate futures 1 and 3</li> <li>- Possible HAB (speculative and variable dependent)</li> <li>- Ice-free conditions at springs</li> <li>- Dry conditions at Graham Spring</li> <li>- Wetland retreat at Tarpot Spring in summer</li> <li>- Low DO in Springs</li> <li>- <b>Less water in river</b></li> <li>- Low DO in river</li> <li>- Increased releases from dam into river</li> <li>- Warmer H2O in river</li> <li>- Declining groundwater table with resulting effect on monument wells</li> </ul>	<ul style="list-style-type: none"> <li>- Graham Spring would be drying up (Tarpot Spring is more resistant to drying)</li> <li>- Increased river water temperature</li> <li>- Ice-free conditions would be more common (in river and springs)</li> <li>- Changes to dam water releases (varies by scenario) that would affect river regime</li> <li>- Pressures on surface and groundwater withdrawals would likely increase under most scenarios</li> </ul>

**Table 1d. Climate Scenario-Related Stressors and Potential Implications for Paleontological Resources***Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	<p><b>FORMATION:</b></p> <ul style="list-style-type: none"> <li>- Uncertainties exist in causality of freeze/thaw and moisture changes on rock fall rate (diversity of drivers and triggers). However, if there is correlation, a decrease in spalling on formation (tower) may result from fewer "freeze/thaw" cycles</li> </ul> <p><b>PALEONTOLOGICAL RESOURCES (AS FOR DETO ARCH RESOURCES):</b></p> <ul style="list-style-type: none"> <li>- Increased exposure and damage through fire, flood, visitation, and severe storm events - likely under 3 of the 4 scenarios</li> <li>- Increased visitation season (shoulder seasons extending) results in more climbing and higher potential for visitors collecting/damaging resources - Human Impacts</li> </ul>

**Table 1e. Climate Scenario-Related Stressors and Potential Implications for Night Skies***Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified



**Table 1f. Climate Scenario-Related Stressors and Potential Implications for Natural Sounds**

*Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- <i>No scenario-specific implications identified</i>	- <i>No scenario-specific implications identified</i>	- <i>No scenario-specific implications identified</i>	- <i>No scenario-specific implications identified</i>	<ul style="list-style-type: none"> <li>- Increases in shoulder season visitation would extend duration of visitor-related noises (vehicles, climbers, camping)</li> <li>- Changing bird species composition would alter natural soundscape</li> <li>- Changes in any wildlife (insects, etc.) species composition would alter natural soundscapes</li> <li>- Impact on visitor experiences.</li> </ul>

**Table 1g. Climate Scenario-Related Stressors and Potential Implications for Scenic Views**

*Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- <i>Increased precipitation would exacerbate issue of ponderosa pines blocking historic views from tower trail</i>	- <i>No scenario-specific implications identified</i>	- <i>No scenario-specific implications identified</i>	- Dry conditions would reduce issue of ponderosa pines blocking historic views from tower trail	<ul style="list-style-type: none"> <li>- Increases in wildland fires will further increase smoke and reduced air quality that limit distant views</li> <li>- Increases in wildland fires will further alter surrounding/distant landscape in views</li> </ul>

**Table 1h. Climate Scenario-Related Stressors and Potential Implications for Air Quality***Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- Increases in wildland fires will further increase smoke and reduced air quality

**Table 1i. Climate Scenario-Related Stressors and Potential Implications for Historic Structures***Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Road and culverts could be impacted by increased rain/precipitation</li> <li>- Paved surfaces and ADA (Americans with Disabilities Act) accessibility need to factor slope and runoff</li> <li>- Historical structures - potential for water infiltration (ensure gutters are clear)</li> <li>- Increased air conditioning use</li> <li>- Increased potential for tree fall impacts</li> <li>- Stake ladder potential loss due to increased moisture/rot?</li> <li>- River flooding could increase, which would impact historic structures and road</li> <li>- Tarpot Spring – where the water now sinks (meadow west of housing area), it would flow above ground toward river and affect infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>- Fewer freeze/thaw cycles; could be beneficial</li> <li>- Least likely to impact the stake ladder (continuation of existing impacts)</li> <li>- Continuation of current maintenance cycles</li> <li>- River flooding could increase which would impact historic structures and road .</li> <li>- Landscape scale - Resiliency of structures</li> </ul>	<ul style="list-style-type: none"> <li>- “High-fire” scenario – structures vulnerable</li> <li>- Benefits due to decreased freeze-thaw cycling</li> <li>- Increased air conditioning use (issue of visitor center capacity)</li> <li>- Stake ladder would probably do OK</li> <li>- Prairie dog towns expand in drier conditions, affecting Mission 66 structures and campground</li> </ul>	<ul style="list-style-type: none"> <li>- Potential fire issue/ danger</li> <li>- Roads and culverts - no/ little runoff issues</li> <li>- Drier conditions would help preserve historical structures</li> <li>- Increased air conditioning use</li> <li>- Reduced impacts on the tower ladder</li> <li>- Prairie dog towns expand in drier conditions, affecting Mission 66 structures and campground</li> </ul>	<ul style="list-style-type: none"> <li>- Increases in wildland fires will further increase smoke and reduced air quality</li> </ul>

**Table 1j. Climate Scenario-Related Stressors and Potential Implications for Cultural Landscapes**

*Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Road/culverts could be impacted by increased rain/precipitation</li> <li>- Paved surfaces/ADA accessibility need to factor slope/runoff</li> <li>- Historical structures - potential for water infiltration (ensure gutters are clear)</li> <li>- Increased potential for tree fall impacts</li> <li>- Tower ladder potential loss due to increased moisture/rot?/ humidity</li> <li>- River flooding could increase which would impact historic structures and road</li> <li>- Tarpot Spring – where the water now sinks (meadow west of housing area), it would flow above ground toward river and affect infrastructure</li> <li>- Check scenarios to better understand the rain/water delivery (all at once or gradual), which can affect slope stability under structures, and absorption of the structural materials</li> </ul>	<ul style="list-style-type: none"> <li>- Fewer freeze/thaw cycles; could be beneficial</li> <li>- Least likely to impact the “ladder” (continuation of existing impacts)</li> <li>- Continuation of current maintenance cycles</li> <li>- River flooding could increase which would impact historic structures and road . - Landscape scale? Resiliency of structures (Consider landscape mgt. solutions)</li> </ul>	<ul style="list-style-type: none"> <li>- Benefits due to decreased freeze-thaw cycling</li> <li>- Tower ladder would probably do OK</li> <li>- Prairie dog towns expand in drier conditions, affecting Mission 66 structures and campground</li> <li>- “High-fire” scenario – structures vulnerable</li> </ul>	<ul style="list-style-type: none"> <li>- Potential fire issue/ danger</li> <li>- Roads/culverts - no/little runoff issues</li> <li>- Dry would help preserve historical structures</li> <li>- Reduced impacts on the tower ladder</li> <li>- Prairie dog towns expand in drier conditions, affecting Mission 66 structures and campground</li> </ul>	<ul style="list-style-type: none"> <li>- Need for increased defensible space (from wildfire)</li> <li>- Increased length of fire season</li> <li>- Heat increases will increase exterior maintenance needs substantially (siding, roof, etc.) and historic road maintenance needs</li> <li>- Increased pest damage to historic structures - types of pests (changing - invaders - currently Carpenter Ants)</li> </ul>



**Table 1k. Climate Scenario-Related Stressors and Potential Implications for Archeological Resources***Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Potential for increased erosion, exposure of sites/lithics</li> <li>- Pictographs and historical graffiti more vulnerable to erosion?</li> <li>- Increased potential for tree fall impacts</li> </ul>	<ul style="list-style-type: none"> <li>- Continuation of erosion loss of pictographs and historical graffiti</li> <li>- Continuation of current (management) activities</li> </ul>	<ul style="list-style-type: none"> <li>- "High-fire" scenario—likely exposure of new archeological sites</li> <li>- Increasing visitation/longer visitation season could lead to site impacts</li> <li>- pictographs and historical graffiti - no significant impacts</li> </ul>	<ul style="list-style-type: none"> <li>- creased fire scenario could result in exposed sites</li> <li>- Benefits to pictographs and historical graffiti</li> </ul>	<ul style="list-style-type: none"> <li>- Increased exposure and damage through fire, flood, visitation, and severe storm events - likely under three of the four scenarios</li> <li>- Increased visitation season (shoulder seasons extending) results in more climbing and higher potential for visitors collecting/damaging resources - Human Impacts</li> </ul>

**Table 11. Climate Scenario-Related Stressors and Potential Implications for Sacred Sites, Traditional Uses, Ethnographic Resources**

*Topics identified as a high level of concern are highlighted yellow*

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
<ul style="list-style-type: none"> <li>- Formation (tower) less impacted due to less freeze-thaw</li> <li>- Would continue (persist) regardless of changes</li> <li>- Potential tree encroachment into the ceremonial meadow (Joyner Ridge) due to higher precipitation and fewer fires</li> <li>- Native plants increase growth, benefiting traditional uses, but some may be outcompeted by exotics</li> </ul>	<ul style="list-style-type: none"> <li>- Less likely to increase spalling on formation (tower) due to fewer freeze-thaw cycles</li> <li>- Less change to native plants in this scenario (for traditional uses)</li> </ul>	<ul style="list-style-type: none"> <li>- Formation (tower) would see benefits due to less freeze/thaw</li> <li>- If climbing season shifts, (the change) may support June closure</li> <li>- Native plants and traditional plants ok (many are drought-tolerant)</li> </ul>	<ul style="list-style-type: none"> <li>- Formation (tower)—less impacts, less moisture, less rock fall</li> <li>- Potential for increased emergency response if cultural use coincides with high temperatures</li> <li>- Cultural use/temp potential for emergency response</li> <li>- Hot and dry conditions would decrease availability of plants for traditional uses</li> <li>- Loss of plants and opportunities for ceremonial practices (due to closures) and/or destruction of ceremonial sites from increased wildfire.</li> <li>- Anticipated fewer Pondersosa pines under this scenario, Could impact forests around the meadow / context surrounding the area</li> </ul>	<ul style="list-style-type: none"> <li>- Increased visitation (volume and extended shoulder seasons) would alter availability and quality of ceremonial uses.</li> <li>- Increased climbing would increase impacts to sacred site</li> <li>- Increased fire risk and/or longer fire seasons would further limit traditional uses due to fire bans</li> <li>- Narrower window of opportunity for prescribed fire</li> </ul>

Table 1m. Climate Scenario-Related Stressors and Potential Implications for History  
Topics identified as a high level of concern are highlighted yellow

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified

Table 1n. Climate Scenario-Related Stressors and Potential Implications for Museum Collections and Park Archives  
Topics identified as a high level of concern are highlighted yellow

SPEARFISH IMPLICATIONS	STILL DETO IMPLICATIONS	BLAZIN' HOT (BUT NOT TOO DRY)IMPLICATIONS	ARE WE IN WESTERN KANSAS? IMPLICATIONS	CLIMATE CHANGE IMPLICATIONS COMMON TO MOST/ALL SCENARIOS
- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified	- No scenario-specific implications identified





# STEWARDSHIP GOALS

Stewardship goals are essential to the RSS process because they articulate what managers are working to achieve for a park's natural and cultural resources and provide both the framework to structure activities later in the RSS process and the time frame needed to reach them. Long-term goals are defined as those that park staff wish to accomplish in a 10- to 20-year time frame. Short-term goals are those that are attainable in a 3- to 5-year time frame.

## Stewardship goals focus on

1. improving quality and/or completeness of current resource information and documentation of one or multiple priority resources;
2. improving or maintaining the conditions of one or multiple priority resources
3. reducing issues, stressors, or threats that are adversely affecting priority resources; or
4. addressing other management needs for resource stewardship, such as increasing collaboration with partners or expanding education and interpretation related to the monument's priority resources.

An important consideration in establishing goals is to determine the appropriate level of knowledge and information and the desired condition for each priority resource. Long-term stewardship goals typically bear a strong relationship to broad, qualitative direction for resource management that are set forth in legal mandates, NPS mandates, or established park management documents. Short-term goals tier off long-term goals and set more specific targets for resource management. Short-term goals help drive the development of stewardship activities.

As explained previously, for the DETO RSS, the standard RSS development process and climate scenario planning first became fully integrated via the development of climate-smart resource stewardship goals. When developing and refining the long-term and short-term stewardship goals, the RSS project team considered the implications of non-climate key issues, stressors, and threats, as well as the implications of climate-related stressors associated with the various plausible climate futures. Please see tables 2a through 2o for the goals associated with each priority resource.

Table 2a. Long-Term and Short-Term Stewardship Goals for Priority Resource—Vegetation Communities

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
VEGETATION COMMUNITIES	<b>UPLAND FOREST, WOODLAND, AND MEADOW STEWARDSHIP.</b> Adaptively manage to maintain upland forest, woodland, and prairie in proportions within the historical range of variability through 2030, while preparing for potential longer-term, climate change-driven changes that may be difficult or impossible to resist.	<ul style="list-style-type: none"> <li>- Expand park knowledge base about upland vegetation community condition and trends via vegetation inventory, monitoring, and assessments.</li> <li>- Regularly monitor and mitigate potential for crown fire and pine beetle outbreaks in upland forests and woodlands.</li> </ul>
VEGETATION COMMUNITIES	<b>NONNATIVE FOREST PESTS.</b> Reduce the likelihood of the introduction of nonnative forest pests.	<ul style="list-style-type: none"> <li>- Work with local and regional land managers, neighboring property owners, and the public to help mitigate the spread of nonnative forest pests via information sharing, public education efforts, and direct management.</li> <li>- Develop and enforce park regulations that relate to inspecting or banning wood imported to the monument.</li> </ul>
VEGETATION COMMUNITIES	<b>RIPIARIAN STEWARDSHIP.</b> Steward riparian woodlands through adaptive management planning that acknowledges changing conditions from climate change, altered river flow regime from upstream dam/reservoir management, and other stressors.	<ul style="list-style-type: none"> <li>- Expand park knowledge base about riparian vegetation community condition and trends via vegetation inventory, monitoring, and assessments.</li> <li>- Conduct interim direct management of riparian vegetation to help sustain corridor and resist stressors until riparian management plan is in place.</li> <li>- Develop a park riparian corridor management plan.</li> </ul>
VEGETATION COMMUNITIES	<b>INVASIVE PLANTS.</b> Maintain abundance proportion of exotic/invasive plants at low level (<10%) in identified priority areas and keep noxious weeds in other areas at socially acceptable levels.	<ul style="list-style-type: none"> <li>- Regularly monitor invasive plant species and extent in park, and prioritize species and areas for treatment.</li> <li>- Work regularly with NPS programs to treat and eradicate invasive plants prioritized for treatment.</li> <li>- Pursue collaboration and partnerships with surrounding land managers, agencies, and property owners on invasive plant control.</li> <li>- Expand public education/awareness efforts on invasive plants via park education and interpretation programming.</li> </ul>

**Table 2b. Long-Term and Short-Term Stewardship Goals for Priority Resource—Wildlife Communities**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
<b>WILDLIFE COMMUNITIES</b>	Improve wildlife habitat and connectivity, and adapt to changes in biodiversity and species viability that cannot be resisted.	<ul style="list-style-type: none"> <li>- Improve wildlife habitat and connectivity, and adapt to changes in biodiversity and species viability that cannot be resisted.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Minimize adverse human-wildlife interactions and their effects, while considering climate change influences on visitor and wildlife behavior.	<ul style="list-style-type: none"> <li>- Improve understanding of human-wildlife interactions in the monument.</li> <li>- Improve enforcement, education, and response regarding human-wildlife interactions in the monument to actively and passively help reduce visitor disturbances of wildlife behavior.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Improve climate change-informed understanding of long-term viability of federally listed Devils Tower wildlife species with aim to assist in population recovery within potential ranges under climate change.	<ul style="list-style-type: none"> <li>- Improve climate change-informed understanding of long-term viability of federally listed Devils Tower wildlife species with aim to assist in population recovery within potential ranges under climate change.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Improve understanding of local and regional trends and projections in aquatic and terrestrial wildlife abundance, behavior, distribution, and migration.	<ul style="list-style-type: none"> <li>- Collaborate with external agencies and institutions to gather and share information on aquatic and terrestrial wildlife species, and their abundance, behavior, distribution, and migration.</li> <li>- Conduct wildlife monitoring, inventories, and assessments to better understand condition and trends of aquatic and terrestrial wildlife abundance, behavior, distribution, and migration.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Respond to the threats posed by nonnative, undesirable wildlife species via climate change-informed research and active response.	<ul style="list-style-type: none"> <li>- Respond to the threats posed by nonnative undesirable wildlife species via climate change-informed research and active response.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Respond to the threats posed by wildlife disease via climate change-informed research and active response.	<ul style="list-style-type: none"> <li>- Respond to the threats posed by wildlife disease via climate change-informed research and active response.</li> </ul>



Table 2c. Long-Term and Short-Term Stewardship Goals for Priority Resource—Water Resources (continued)

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
WATER RESOURCES	Improve understanding of status and trends of park seeps, springs, and wetlands to inform stewardship needs (quantity, locations, and condition quality).	<ul style="list-style-type: none"> <li>- Conduct inventory, monitoring, studies, and assessments to improve understanding of park seeps, springs, and wetlands.</li> </ul>
WATER RESOURCES	Improve understanding of status and trends of Belle Fourche River hydrology, water quality, and bank erosion.	<ul style="list-style-type: none"> <li>- Improve understanding of status and trends of Belle Fourche River hydrology, water quality, and bank erosion.</li> </ul>
WATER RESOURCES	Improve park ability to respond to stressors that would alter flows and degrade water quality in the Belle Fourche River and springs and seeps.	<ul style="list-style-type: none"> <li>- Regularly engage with any applicable external agency or entity that plays a role in streamflows or water rights in the Belle Fourche River basin to improve awareness of flow and water rights status and to pursue opportunities to minimize adverse effects to the Belle Fourche River ecology and hydrology.</li> </ul>
WATER RESOURCES	Adaptively manage wetlands through 2030 to improve condition and explore the feasibility of restoring wetlands over the long-term under climate change.	<ul style="list-style-type: none"> <li>- Improve understanding of wetland extent, functionality, and condition to guide short-term adaptive management and help inform changes in long-term management needs.</li> <li>- Plan for long-term wetland management under climate change and other stressors.</li> </ul>
WATER RESOURCES	Explore feasibility of restoring developed springs to natural conditions over the long-term under climate change.	<ul style="list-style-type: none"> <li>- Explore feasibility of restoring developed springs to natural conditions over the long-term under climate change.</li> </ul>
WATER RESOURCES	Improve management of stormwater throughout the monument.	<ul style="list-style-type: none"> <li>- Assess stormwater flows in developed areas of park for flooding, erosion, and other indicators of insufficient stormwater management design or capacity.</li> <li>- Directly manage stormwater in areas identified to have insufficient stormwater management design or capacity.</li> </ul>

Table 2d. Long-Term and Short-Term Stewardship Goals for Priority Resource—Geologic resources and Paleontological Resources

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Increase and improve understanding of geologic resources at the monument.	<ul style="list-style-type: none"> <li>- Encourage geologic research by universities and other geologic science institutions.</li> <li>- Expand geologic science expertise, knowledge, and/or representation in park staffing.</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Improve understanding of paleontological resources at the monument.	<ul style="list-style-type: none"> <li>- Encourage paleontological research by universities and other geologic science institutions.</li> <li>- Gather information on presence and condition of paleontological resources from existing NPS sources, partners, and tribes.</li> </ul>

**Table 2d. Long-Term and Short-Term Stewardship Goals for Priority Resource—Geologic resources and Paleontological Resources (continued)**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Minimize risk for geohazard potential to address visitor safety.	- Minimize rockfall potential along the tower trail.
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Improve education/interpretation of geologic resources/hazards at the monument.	- Improve education and interpretation of geologic resources, processes, and hazards at the monument.
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Preserve geologic and paleontological features and processes (including soils) while minimizing human-caused degradation from visitor use, park facilities/operations, and climate change.	- Ensure appropriate protocols in place and implemented to protect geologic resources and paleontological discoveries, particularly in relation to exposure to climate change-enhanced fire, flood erosion, etc.

**Table 2e. Long-Term and Short-Term Stewardship Goals for Priority Resource—Night Skies**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
NIGHT SKIES	Improve understanding of the condition of the night sky and nocturnal environment.	- Update the understanding and track the evolution of the condition of the night sky resource.
NIGHT SKIES	Improve the condition of the night sky and nocturnal environment.	- Reduce threats to the nocturnal environment and nighttime scenery from <b>outside park boundaries</b> . - Increase outreach and foster investment from the community and nearby partners in the shared night skies and nocturnal environment.

**Table 2f. Long-Term and Short-Term Stewardship Goals for Priority Resource—Natural Sounds**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
NATURAL SOUNDS	Better characterize and understand baseline acoustic environment and its relationship and value to other resources.	- Identify and monitor the condition of the acoustic resource.
NATURAL SOUNDS	Reduce non-natural, unacceptable, and inappropriate noise in the monument environment to enhance condition of natural sounds.	- Reduce noise from NPS activities / park operations. - Reduce noise from visitor-based activities in the monument. - Partner with neighboring communities, landowners, and other entities to reduce noise impacts.
NATURAL SOUNDS	Improve public (other federal and state agency / NPS staff) understanding of the effects of non-natural sounds on park resources and experiences.	- Develop soundscape interpretive and education activities that celebrate the monument's acoustic environment and educate about noise impacts.

Table 2g. Long-Term and Short-Term Stewardship Goals for Priority Resource—Scenic Views

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
<b>SCENIC VIEWS</b> - INTERNAL - EXTERNAL	The monument has knowledge and information of monument scenic views, and protects, improves, and monitors the condition of views important for natural scenery and cultural resources both within and across park boundaries to maintain or improve visual character.	<ul style="list-style-type: none"> <li>- <b>KNOWLEDGE.</b> Inventory and monitor park views to assess changing scenic view conditions.</li> <li>- Protect and improve internally. To the extent possible within the monument, minimize changes, visual contrast, and intrusions to views. (Natural and Cultural)</li> <li>- Collaborate with adjacent landowners, planners, developers, and other stakeholders to promote cooperative conservation of important views across park boundaries.</li> <li>- <b>SHARE.</b> Provide enhanced opportunities for visitor access and understanding importance of park views.</li> </ul>

Table 2h. Long-Term and Short-Term Stewardship Goals for Priority Resource—Air Quality

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
<b>AIR QUALITY</b>	Improve the monument's overall air quality condition and increase understanding of air pollution impacts. Collaboration with others to perpetuate the best possible air quality for the protection of resources affected by air pollution.	<ul style="list-style-type: none"> <li>- <b>IMPROVE.</b> Be an environmental leader by reducing park air pollutant emissions, improving park sustainability and environmental management.</li> <li>- <b>UNDERSTAND.</b> Improve understanding of air quality through compiling existing information, identifying sensitive resources, assessing future research needs, and educating staff &amp; public about impacts to park resources.</li> <li>- <b>WORK COOPERATIVELY.</b> Collaborate with other federal, state, and regional planning organizations, and stakeholders to reduce air quality impacts in the monument from sources of air pollution.</li> </ul>



**Table 2i. Long-Term and Short-Term Stewardship Goals for Priority Resource—Historic Structures**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
<b>HISTORIC STRUCTURES</b>	<b>INVENTORY AND DOCUMENTATION.</b> Inventory and documentation of the historic structures are up to date, meet the standards of Section 110 of the NHPA, and are recorded in relevant resource management databases. NRHP documentation is updated every 20 years.	<ul style="list-style-type: none"> <li>- Documentation is completed and up-to-date for all historic structures, and includes required components sufficient to meet policy requirements and management needs.</li> <li>- All historic structures are entered into appropriate management databases (FMSS and LCS) and information is current.</li> </ul>
<b>HISTORIC STRUCTURES</b>	<b>PLANNING.</b> Climate change implications are integrated into stewardship activities, planning and treatment of historic structures.	<ul style="list-style-type: none"> <li>- Planning and treatment documents incorporate interdisciplinary approaches related to climate adaptation.</li> </ul>
<b>HISTORIC STRUCTURES</b>	<b>PRESERVATION.</b> Historic structures are preserved and maintained in good condition, with consideration for unavoidable disturbance or natural deterioration. Preservation treatments follow a long-term strategy for management based on significance, existing conditions, use, and other factors, including adaptation to climate change.	<ul style="list-style-type: none"> <li>- Preservation treatment strategies for historic structures are updated, considering climate change.</li> </ul>

**Table 2j. Long-Term and Short-Term Stewardship Goals for Priority Resource—Cultural Landscapes**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
<b>CULTURAL LANDSCAPES</b>	<b>INVENTORY AND DOCUMENTATION.</b> The monument's cultural landscapes are inventoried and documented with up-to-date information that meets the standards of Section 110 of the NHPA, and are recorded in relevant resource management databases.	<ul style="list-style-type: none"> <li>- Park has current inventory and documentation sufficient to thoroughly understand and identify each of the monument's cultural landscapes and their contributing features. Inventory information is recorded in management databases.</li> </ul>
<b>CULTURAL LANDSCAPES</b>	<b>PRESERVATION.</b> Cultural landscapes are preserved and maintained in good condition, with consideration for unavoidable disturbance or natural deterioration. Preservation treatments follow a long-term strategy for management based on significance, existing conditions, use, and other factors, including adaptation to climate change.	<ul style="list-style-type: none"> <li>- Cultural landscapes are managed by following up-to-date treatment recommendations and strategies that meet NPS policy and guidelines.</li> </ul>

Table 2k. Long-Term and Short-Term Stewardship Goals for Priority Resource—Archeological Resources

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
ARCHEOLOGICAL RESOURCES	<b>DOCUMENTATION.</b> Archeological sites are identified and inventoried to inform management decisions at the monument. A parkwide survey with archeological site forms are up-to-date.	<ul style="list-style-type: none"> <li>- Archeological survey and site information is updated to address current research questions, record newly exposed sites, and update Determinations of Eligibility (DOE) forms for archeological sites.</li> <li>- Archeological resource databases (ASMIS, FMSS) are up to date and include all archeological resources, as required.</li> <li>- A formal archeological site monitoring program is established. This program, which recognizes and monitors for climate change-related changes in impacts from enhanced visitation and potential increases in erosion and wildfire, includes updated condition assessments, determinations of eligibility (DOEs), confirm/update geospatial data for boundaries, and updated site forms as appropriate.</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>RESEARCH.</b> Research on archeological resources is conducted to inform resource management (e.g., obsidian research).	<ul style="list-style-type: none"> <li>- Climate change vulnerabilities for archeological resources are identified.</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>PRESERVATION.</b> Archeological sites are protected in an undisturbed condition with appropriate protocols in place to address inadvertent finds or exposure due to fire or erosion.	<ul style="list-style-type: none"> <li>- The monument follows management recommendations for archeological sites assessed in fair or poor condition. Site condition is improved where possible, maintained, and monitored to protect data potential, or determine an alternative course of action. Sites vulnerable to off-trail trampling are protected using best practices, such as barriers (benches, branches, etc.) and signage to discourage visitor access.</li> <li>- A formalized prescribed fire program with regard to archeological survey and protection is in place.</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>OUTREACH.</b> Outreach, education, and interpretation of archeological resources occurs to raise awareness of their importance and need for protection in the context of the climate change-related challenges of 1) expanding visitation shoulder seasons and 2) potential increases in site exposure (from heavy precipitation and wildfire).	<ul style="list-style-type: none"> <li>- Develop interpretive waysides that improve public understanding of archeological resources.</li> </ul>

**Table 2l. Long-Term and Short-Term Stewardship Goals for Priority Resource—Sacred Sites, Traditional Uses, and Ethnographic Resources**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC	<b>MANAGEMENT.</b> Park includes areas appropriate for ceremonial uses.  Note: this deals with the encroachment of forest into the meadow at Joyner Ridge.	<ul style="list-style-type: none"> <li>- Maintain areas for ceremonial use in the monument while consulting with tribes on how best to prepare for possible climate-driven changes in ceremonial areas.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	<b>TRIBAL CONSULTATION.</b> The monument follows a thorough tribal consultation process that meets NPS policy and follows best practices.	<ul style="list-style-type: none"> <li>- The monument has established a more proactive consultation approach that is more comprehensive in terms of all projects in the monument.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	<b>TEK MANAGEMENT.</b> Park management decisions consider traditional ecological knowledge and practices to inform resource planning.	<ul style="list-style-type: none"> <li>- The monument engages with tribes on planning, including incorporation of traditional ecological knowledge and understanding of climate change vulnerabilities.</li> <li>- Knowledge of consultation history and past and present practices guides ongoing consultation and park resource management.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	<b>KNOWLEDGE/ DOCUMENTATION.</b> DETO has adequate and up-to-date knowledge and documentation of ethnographic resources and traditional uses to support planning, resource management, and tribal relationships. Traditional Cultural Property and National Register documentation is complete.	<ul style="list-style-type: none"> <li>- The extent of the monument as a traditional cultural property is determined.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	<b>OUTREACH.</b> Provide enhanced opportunities for visitor understanding of the monument as a sacred site and its traditional uses by reaching out to local communities.	<ul style="list-style-type: none"> <li>- Park staff support or facilitate discussions between tribal members and local climbing communities on the importance of the tower as a sacred site to improve the mutual understanding of these user groups.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	<b>MANAGEMENT.</b> The monument continues to implement strategies to help minimize the number of climbers during the voluntary climbing closure in June.	<ul style="list-style-type: none"> <li>- Continue to reduce the number of climbers in June.</li> </ul>

**Table 2m. Long-Term and Short-Term Stewardship Goals for Priority Resource—History**

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
HISTORY	<b>KNOWLEDGE.</b> The monument has sufficient knowledge and understanding of the monument's human history, including climbing history, to help inform park interpretation and management.	<ul style="list-style-type: none"> <li>- Resource management is guided by an up-to-date historic resource studies and an up-to-date NRHP nomination.</li> <li>- Park has access to oral history transcripts from non-tribal individuals (ranchers, other locals) to inform historic contexts and resource management.</li> </ul>

Table 2n. Long-Term and Short-Term Stewardship Goals for Priority Resource—Museum Collections and Park Archives

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
MUSEUM COLLECTIONS AND PARK ARCHIVES	ACCESS AND USE. Organization, access, and usability to archives and records for park staff and public is maintained or improved.	<ul style="list-style-type: none"> <li>- The monument's staff has an understanding of how the collections are used and public access to the collections is increased.</li> </ul>
MUSEUM COLLECTIONS AND PARK ARCHIVES	KNOWLEDGE AND INVENTORY. All museum collection items are accessioned and cataloged per NPS standards for museum collections. Baseline documents for the collection specified in DO-28 and DO-24 are complete and up to date.	<ul style="list-style-type: none"> <li>- The scope of the monument's collections is known and a statement for management is maintained. A committee is established to review accessions and deaccessions. Collections processing and cataloging is up to date.</li> <li>- All museum collection items are surveyed for condition and preserved and maintained per NPS standards for museum collections. Baseline documents for collection management specified in DO-28 and DO-24 are complete and up to date. All resource management projects include curation work required.</li> </ul>
MUSEUM COLLECTIONS AND PARK ARCHIVES	PLANNING AND INTERPRETATION. Park planning and interpretation incorporates the monument's museum collection to enhance integrated approaches to resource management and interpretation.	<ul style="list-style-type: none"> <li>- Park planning efforts address the value of museum collections, as applicable, and interpretive programming is supported by the display of museum objects to enhance public understanding of the monument.</li> </ul>

Table 2o. Long-Term and Short-Term Stewardship Goals for Priority Resource—Parkwide Resource Information and Climate Change Information

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Track, maintain, and share climate change information to expand staff and public understanding of climate change at the monument.	<ul style="list-style-type: none"> <li>- Better understand and track long-term climate trends and possible resource effects.</li> <li>- Improve public and NPS staff understanding of climate change and its effects.</li> <li>- Identify historical impacts and future vulnerabilities of climate change on priority resources.</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Effectively organize, maintain, use, and share resource data and documentation.	<ul style="list-style-type: none"> <li>- Improve opportunities to access, use, and interact with natural and cultural resource data for park staff and public.</li> <li>- Improve data quality and management to support project management and inform resource management (digital records, etc.).</li> <li>- Collect and document resource data via defensible scientific methods.</li> <li>- Maintain an up-to-date, accessible research library system for park staff, and possibly visitors.</li> </ul>





# HIGH-PRIORITY STEWARDSHIP ACTIVITIES

Stewardship activities represent the primary product of the RSS development process, providing the monument with a roadmap for investing both human and financial resources in the stewardship of natural and cultural resources. They are logically organized, based on science and/or scholarship, well documented and reviewed by subject-matter experts. Activities are aimed at achieving short-term goals and may also strive to reduce stressors on priority resources.

The RSS project team identified a wide array of management activities to consider over the next 3- to 5-years. At DETO, the most prominent illustration of integrated resource stewardship involves the management of the monument's cultural landscape, which encompasses most of the area within the monument boundary and numerous priority resources. These priority resources include, but are not limited to, cultural landscapes, sacred sites, traditional uses, ethnographic resources, historic structures, vegetation communities, geologic resources, and night skies. As a more specific example, the stewardship of the vegetation communities (a natural resource) is integral to the stewardship of the cultural values of the monument's cultural landscape (a cultural resource). Activities and goals that are directly intended to affect one will undoubtedly affect the other, and vice versa. Therefore, in managing both resources, it is important and more efficient to consider how stewardship activities can be integrated to improve the condition and knowledge base of both the vegetation and cultural landscape in tandem. In turn, it is also very important that the management of these two resources involve multiple disciplines of subject-matter expertise across the cultural and natural resource management spectrum. The same logic applies to all of the other mentioned elements of the cultural landscape noted above. Of course, other examples of this type of integrated resource stewardship can be found throughout the RSS goals and activities. In addition, many of the activities developed include components that involve partnerships or coordination with regional NPS staff. The monument made an effort to consider and document integrated resource management efforts within these activities and will seek to carry them out as described.

While the RSS desktop application includes all of the activities identified for each priority resource, the following tables present (tables 3a-3o) only those activities that monument staff determined to be high priority in the next 3 to 5 years, along with associated short-term goals. The team considered a variety of factors when determining priorities, including feasibility and impact of the management activity, urgency, potential funding opportunities, and sequencing in relation to other activities. Medium and low priority activities are still valuable approaches for achieving resource objectives, but they are generally less urgent or represent secondary approaches. Many of the medium and low priority activities may rise to the level of high priority in the coming years, as stewardship activities are implemented, stewardship goals are achieved, and resource conditions change over time.

Table 3a. High-Priority Stewardship Activities for Priority Resource—Vegetation Communities

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
VEGETATION COMMUNITIES	Expand park knowledge base about upland vegetation community condition and trends via vegetation inventory, monitoring, and assessments.	<ul style="list-style-type: none"> <li>- Continue long-term vegetation monitoring of plant community composition and structure.</li> </ul>
VEGETATION COMMUNITIES	Regularly monitor and mitigate potential for crown fire and pine beetle outbreaks in upland forests and woodlands.	<ul style="list-style-type: none"> <li>- Apply mechanical thinning and/or prescribed fire to reduce risks of crown fires and pine beetle outbreaks and to improve the health of meadow communities.</li> <li>- Conduct tribal consultation on any proposed upland vegetation management actions.</li> </ul>
VEGETATION COMMUNITIES	Work with local and regional land managers, neighboring property owners, and the public to help mitigate the spread of nonnative forest pests via information sharing, public education efforts, and direct management.	<ul style="list-style-type: none"> <li>- Collaborate with State of Wyoming emerald ash borer exclusion activities.</li> </ul>
VEGETATION COMMUNITIES	Develop and enforce park regulations that relate to inspecting or banning wood imported to the monument.	<ul style="list-style-type: none"> <li>- Update Superintendent's Compendium to address imported firewood.</li> <li>- Actively enforce outside firewood ban in campground.</li> <li>- Include language in special use permits to prevent import of firewood from outside the monument unless it has been certified pest-free.</li> <li>- Pursue ways to provide certified pest-free firewood to DETO campers (through a CUA or other mechanism).</li> </ul>
VEGETATION COMMUNITIES	Conduct interim direct management of riparian vegetation to help sustain corridor and resist stressors until riparian management plan is in place.	<ul style="list-style-type: none"> <li>- Conduct tribal consultation on any proposed riparian vegetation management actions.</li> </ul>
VEGETATION COMMUNITIES	Develop a park riparian corridor management plan.	<ul style="list-style-type: none"> <li>- Develop a long-term riparian area management plan that accounts for climate change, forest pests, and altered river flow regime, and includes desired conditions for both canopy and understory composition and structure. Via TAR, CCRP can assist on climate implications.</li> </ul>
VEGETATION COMMUNITIES	Regularly monitor invasive plant species and extent in park, and prioritize species and areas for treatment.	<ul style="list-style-type: none"> <li>- Regularly identify and update priority invasive plant species list, to include new species threats that will receive priority treatment attention.</li> </ul>
VEGETATION COMMUNITIES	Work regularly with NPS programs to treat and eradicate invasive plants prioritized for treatment.	<ul style="list-style-type: none"> <li>- Continue to work with Northern Great Plains Invasive Plant Management Team (NGP IPMT) to apply integrated pest management approach to regularly treat identified priority invasive species and areas.</li> <li>- Conduct annual winter planning meeting that includes park, NGP IPMT, NGP fire, and NGP Network to coordinate annual vegetation management efforts (i.e., prescribed fire, thinning, invasive plant control, restoration, etc.)</li> <li>- Ensure tribes are informed of herbicide use in/near traditional plant gathering areas through the plant gathering agreements.</li> </ul>

**Table 3b. High-Priority Stewardship Activities for Priority Resource—Wildlife Communities**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
<b>WILDLIFE COMMUNITIES</b>	Improve understanding of human-wildlife interactions in the monument.	<ul style="list-style-type: none"> <li>- Assess the risk of visitor use activities in park on white-nose syndrome transmission.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Improve enforcement, education, and response regarding human-wildlife interactions in the monument to actively and passively help reduce visitor disturbances of wildlife behavior.	<ul style="list-style-type: none"> <li>- Continue falcon climbing closure.</li> <li>- Continue law enforcement capacity to ensure enforcement of park regulations that help protect wildlife and habitat (speeding, closures, etc.).</li> <li>- Develop a protocol for responding to human-wildlife interactions in park.</li> <li>- Incorporate wildlife education/awareness in the comprehensive sign management plan.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Improve climate change-informed understanding of long-term viability of federally listed Devils Tower wildlife species with aim to assist in population recovery within potential ranges under climate change.	<ul style="list-style-type: none"> <li>- Incorporate revised information from Biological Opinion of NLEB into update of fire management plan and snag protocol.</li> <li>- Collaborate with Wyoming Natural Diversity Database to identify NLEB hibernacula.</li> <li>- Conduct assessment of current status and expected climate change impacts on proposed or candidate T&amp;E species that occur or are likely to occur at DETO.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Collaborate with external agencies and institutions to gather and share information on aquatic and terrestrial wildlife species, and their abundance, behavior, distribution, and migration.	<ul style="list-style-type: none"> <li>- Collaborate with Wyoming Natural Diversity Database on tracking bat occurrence and habitat use at DETO.</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Conduct wildlife monitoring, inventories, and assessments to better understand condition and trends of aquatic and terrestrial wildlife abundance, behavior, distribution, and migration.	<ul style="list-style-type: none"> <li>- Cyclically monitor the prairie dog colony.</li> <li>- Cyclically monitor peregrine falcons.</li> <li>- Cyclically monitor bats.</li> <li>- Cyclically monitor breeding birds (I&amp;M).</li> </ul>
<b>WILDLIFE COMMUNITIES</b>	Respond to the threats posed by wildlife disease via climate change-informed research and active response.	<ul style="list-style-type: none"> <li>- Collaborate with Wyoming Natural Diversity Database on bat white-nose syndrome surveillance.</li> <li>- Monitor prairie dog population for diseases.</li> </ul>

**Table 3c. High-Priority Stewardship Activities for Priority Resource—Water Resources**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
WATER RESOURCES	Conduct inventory, monitoring, studies, and assessments to improve understanding of park seeps, springs, and wetlands.	<ul style="list-style-type: none"> <li>- Identify locations of seeps, wetlands, and springs and publish and disseminate.</li> </ul>
WATER RESOURCES	Improve understanding of status and trends of Belle Fourche River hydrology, water quality, and bank erosion.	<ul style="list-style-type: none"> <li>- Cyclically monitor Belle Fourche pH, temp, DO, conductivity, discharge, and turbidity (3 year interval).</li> <li>- Cyclically monitor river bank and channel morphology.</li> <li>- Assess historic river channel dynamics using existing historic data (e.g., aerial imagery) to inform future potential change in alignment as it relates to boundary issues.</li> </ul>
WATER RESOURCES	Regularly engage with any applicable external agency or entity that plays a role in streamflows or water rights in the Belle Fourche River basin to improve awareness of flow and water rights status and to pursue opportunities to minimize adverse effects to the Belle Fourche River ecology and hydrology.	<ul style="list-style-type: none"> <li>- Engage in compliance processes of external development projects (e.g., as cooperating agency) to increase NPS voice and awareness in local/regional projects that affect park surface and groundwater hydrology.</li> </ul>
WATER RESOURCES	Assess stormwater flows in developed areas of park for flooding, erosion, and other indicators of insufficient stormwater management design or capacity.	<ul style="list-style-type: none"> <li>- Identify and prioritize locations of stormwater problems.</li> </ul>
WATER RESOURCES	Directly manage stormwater in areas identified to have insufficient stormwater management design or capacity.	<ul style="list-style-type: none"> <li>- Incorporate treatment recommendations for culverts in Historic Structures Report update.</li> </ul>



**Table 3d. High-Priority Stewardship Activities for Priority Resource—Geologic Resources and Paleontological Resources**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
<b>GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES</b>	Encourage paleontological research by universities and other geologic science institutions.	<ul style="list-style-type: none"> <li>- Pursue technical assistance request with GRD to increase staff/info capacity at the monument to help facilitate paleontological research (fieldwork and reporting out).</li> </ul>
<b>GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES</b>	Gather information on presence and condition of paleontological resources from existing NPS sources, partners, and tribes.	<ul style="list-style-type: none"> <li>- Update paleontological resource inventory.</li> <li>- Reach out to tribes to seek tribal information sources and tribal interpretation of paleontological resources.</li> </ul>
<b>GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES</b>	Minimize rockfall potential along the tower trail.	<ul style="list-style-type: none"> <li>- Assess rockfall potential around tower to identify priority/trouble areas on tower and priority/trouble areas on tower trail.</li> <li>- Develop rockfall hazard management protocol.</li> </ul>
<b>GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES</b>	Ensure appropriate protocols in place and implemented to protect geologic resources and paleontological discoveries, particularly in relation to exposure to climate change-enhanced fire, flood erosion, etc.	<ul style="list-style-type: none"> <li>- When paleontological resources are located, evaluate vulnerability in field and take appropriate actions on collection and recording.</li> <li>- Conduct detailed, structured, scenario-based vulnerability assessments of the major known paleontological sites that assesses exposure and sensitivity of a site to potential increases in visitation, erosion, wildfire, and climate change (and include a climate scenario-based approach).</li> </ul>

**Table 3e. High-Priority Stewardship Activities for Priority Resource—Night Skies**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
<b>NIGHT SKIES</b>	Update the understanding and track the evolution of the condition of the night sky resource.	<ul style="list-style-type: none"> <li>- Work with Natural Sounds and Night Skies Division (NSNSD) to obtain geospatial maps of predicted sky conditions for the monument and adjacent lands.</li> </ul>
<b>NIGHT SKIES</b>	Increase outreach and foster investment from the community and nearby partners in the shared night skies and nocturnal environment.	<ul style="list-style-type: none"> <li>- Continue adding information to the monument website and social media outlets that promote and educate about night skies and fully sustainable lighting practices.</li> </ul>

Table 3f. High-Priority Stewardship Activities for Priority Resource—Natural Sounds

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
NATURAL SOUNDS	Identify and monitor the condition of the acoustic resource.	<ul style="list-style-type: none"> <li>- Develop park soundscape management plan that incorporates indicators, thresholds, park operation BMPs, outreach/interpretation elements, etc.</li> </ul>
NATURAL SOUNDS	Reduce noise from NPS activities / park operations.	<ul style="list-style-type: none"> <li>- Incorporate quiet pavements for PMIS statements regarding park road and road maintenance projects.</li> <li>- Explore quieter alternatives to rumble strips near visitor center parking entrance to reduce noise.</li> </ul>
NATURAL SOUNDS	Partner with neighboring communities, landowners, and other entities to reduce noise impacts	<ul style="list-style-type: none"> <li>- Update superintendent's compendium for consistency on allowable overflights, if any.</li> <li>- Pursue discussions with local airports, private runways, military base, and FAA to reduce overflight noise and enforce no-fly zone.</li> </ul>
NATURAL SOUNDS	Develop soundscape interpretive and education activities that celebrate the monument's acoustic environment and educate about noise impacts.	<ul style="list-style-type: none"> <li>- Develop consistent park standard/policy on messaging that does not promote external noise-generating activities, particularly promoted helicopter and military bomber overflights. Incorporate policy into superintendent's compendium and applicable soundscape management plan and protocols.</li> </ul>

Table 3g. High-Priority Stewardship Activities for Priority Resource—Scenic Views

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
SCENIC VIEWS - INTERNAL - EXTERNAL	<b>KNOWLEDGE.</b> Inventory and monitor park views to assess changing scenic view conditions.	<ul style="list-style-type: none"> <li>- Complete a technical assistance request to the Air Resources Division Visual Resource Program for a visual resource inventory to establish baseline condition of selected views.</li> <li>- Identify views important to the monument purpose, visitor, cultural landscapes inventories, and tribal values. Include tribal consultation.</li> <li>- Conduct a visual resource inventory using the NPS ARD inventory process to establish baseline condition of selected views by documenting scenic quality and view importance.</li> <li>- Assess vulnerability of park views using NPS ARD guidance to understand protections and threats. Apply geospatial data tool.</li> </ul>
SCENIC VIEWS - INTERNAL - EXTERNAL	Protect and improve internally. To the extent possible within the monument, minimize changes, visual contrast, and intrusions to views. (Natural and Cultural)	<ul style="list-style-type: none"> <li>- Incorporate written BMPs in applicable contracts to reduce impacts to scenic views impacts.</li> </ul>
SCENIC VIEWS - INTERNAL - EXTERNAL	<b>SHARE.</b> Provide enhanced opportunities for visitor access and understanding importance of park views.	<ul style="list-style-type: none"> <li>- Establish park webcam(s) to provide a virtual experience of park scenery.</li> <li>- Make select park views accessible to visitors of all ability levels.</li> </ul>

**Table 3h. High-Priority Stewardship Activities for Priority Resource—Air Quality**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
AIR QUALITY	<b>IMPROVE.</b> Be an environmental leader by reducing park air pollutant emissions, improving park sustainability and environmental management.	<ul style="list-style-type: none"> <li>- Establish and achieve GHG emissions reduction goals in Modified Environmental Management System Plan (MEMS).</li> <li>- Continue implementing the monument's NPS Climate Friendly Park Action Plan and Environmental Management System.</li> <li>- Develop park Energy, Waste, Water, and Lighting Guidelines for park staff and volunteers.</li> </ul>
AIR QUALITY	<b>UNDERSTAND.</b> Improve understanding of air quality through compiling existing information, identifying sensitive resources, assessing future research needs, and educating staff & public about impacts to park resources.	<ul style="list-style-type: none"> <li>- Continue participation in the national dragonfly mercury project coordinated by ARD.</li> <li>- Develop oil, gas, coal, and other threat summary.</li> <li>- Ensure that key resource staff are familiar with and bookmark online park air quality information provided by ARD.</li> </ul>

**Table 3i. High-Priority Stewardship Activities for Priority Resource—Historic Structures**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
HISTORIC STRUCTURES	Documentation is completed and up-to-date for all historic structures, and includes required components sufficient to meet policy requirements and management needs.	<ul style="list-style-type: none"> <li>- Conduct an architectural inventory and evaluation of Mission 66 resources, and enter them into LCS. Consult with SHPO over proposed DOEs.</li> </ul>
HISTORIC STRUCTURES	All historic structures are entered into appropriate management databases (FMSS and LCS) and information is current.	<ul style="list-style-type: none"> <li>- Update Mission 66 structures in FMSS database if they are found NR-eligible.</li> </ul>
HISTORIC STRUCTURES	Preservation treatment strategies for historic structures are updated, considering climate change.	<ul style="list-style-type: none"> <li>- Implement treatment recommendations of the Vanishing Treasures documentation.</li> </ul>

**Table 3j. High-Priority Stewardship Activities for Priority Resource—Cultural Landscapes**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
CULTURAL LANDSCAPES	Park has current inventory and documentation sufficient to thoroughly understand and identify each of the monument's cultural landscapes and their contributing features. Inventory information is recorded in management databases.	<ul style="list-style-type: none"> <li>- Complete a CLI of the Tower Trail and Red Beds Trail landscape. (underway, and linked to the AIP project).</li> <li>- Complete a CLI for the Ethnographic landscape (parkwide).</li> </ul>
CULTURAL LANDSCAPES	Cultural landscapes are managed by following up-to-date treatment recommendations and strategies that meet NPS policy and guidelines.	<ul style="list-style-type: none"> <li>- Ensure maintenance staff (and staff in general) are made aware of associated elements, sites, structures, etc. for cultural landscapes as they are documented.</li> </ul>

**Table 3k. High-Priority Stewardship Activities for Priority Resource—Archeological Resources**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
ARCHEOLOGICAL RESOURCES	Archeological survey and site information is updated to address current research questions, record newly exposed sites, and update Determinations of Eligibility (DOE) forms for archeological sites.	<ul style="list-style-type: none"> <li>- Submit Technical Assistance Requests to the regional archeology office as needed to continue work toward conducting an updated survey and completing DOEs forms.</li> <li>- Conduct archeological survey to cover about 336 acres per year, resulting in completed parkwide survey in about five years, including summary. Obtain DOEs for newly discovered sites, and update DOEs for known sites that lack signed DOE documentation on file.</li> <li>- Update spatial data for archeological sites during survey.</li> <li>- Data recovery: Known prehistoric pictographs are recorded with updated technology, such as LiDAR or other available photographic technologies.</li> </ul>
ARCHEOLOGICAL RESOURCES	A formalized prescribed fire program with regard to archeological survey and protection is in place.	<ul style="list-style-type: none"> <li>- Update the Fire Management Plan to address archeological survey needs and protection. Include GIS data and an overlay analysis, consulting with Regional GIS. Design/ implement prescribed fire treatments based on site wildfire vulnerabilities characterized in an archeology site vulnerability analysis. Include tribal and SHPO consultation.</li> </ul>



**Table 3l. High-Priority Stewardship Activities for Priority Resource—Sacred Sites, Traditional Uses, and Ethnographic Resources**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	Maintain areas for ceremonial use in the monument while consulting with tribes on how best to prepare for possible climate-driven changes in ceremonial areas.	<ul style="list-style-type: none"> <li>- Use prescribed fire and/or mechanical thinning to maintain open areas for ceremonial uses, consulting with tribes for appropriate timing and methods. Explore other strategies for keeping an open meadow if fire is not an option, including working with the TEK program.</li> <li>- Ensure that special-use permits and compliance requirements for all special uses for traditional activities are completed well in advance. Discuss communal maintenance of structures (sweat lodge).</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	The monument has established a more proactive consultation approach that is more comprehensive in terms of all projects in the monument.	<ul style="list-style-type: none"> <li>- Establish a new consultation process of sending out a comprehensive list of all projects for the year and asking tribes which projects they want to be engaged in. Periodically update the list with new information during the year, particularly when consultation is needed.</li> <li>- Make sure that tribal consultation is included in the scope of all projects, as applicable. This may involve inviting tribes as a cooperating agency.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	The extent of the monument as a traditional cultural property is determined.	<ul style="list-style-type: none"> <li>- Develop an SOP for cultural offerings; their protection, documentation, and criteria for removal.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	Park staff support or facilitate discussions between tribal members and local climbing communities on the importance of the tower as a sacred site to improve the mutual understanding of these user groups.	<ul style="list-style-type: none"> <li>- Engage tribes in park messaging during the June voluntary climbing closure.</li> </ul>
SACRED SITES, TRADITIONAL USES, AND ETHNOGRAPHIC RESOURCES	Continue to reduce the number of climbers in June.	<ul style="list-style-type: none"> <li>- Update the climbing management plan to consider approaches to the voluntary climbing closure in June and incorporating outreach efforts and outcomes.</li> </ul>

**Table 3m. High-Priority Stewardship Activities for Priority Resource—History**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
HISTORY	Resource management is guided by an up-to-date historic resource studies and an up-to-date NRHP nomination.	<ul style="list-style-type: none"> <li>- Complete a Historic Resource Study in 2019.</li> <li>- Complete new NRHP documentation for newly evaluated structures, cultural landscapes, and TCPs, as CLIs and historic structures documentation.</li> </ul>

**Table 3n. High-Priority Stewardship Activities for Priority Resource—Museum Collections and Park Archives**

PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
MUSEUM COLLECTIONS AND PARK ARCHIVES	The scope of the monument's collections is known and a statement for management is maintained. A committee is established to review accessions and deaccessions. Collections processing and cataloging is up to date.	<ul style="list-style-type: none"> <li>- Determine if recently identified archives on the monument can be moved off the monument and curated elsewhere, or must remain.</li> <li>- Ensure that Boards of Survey and deaccessioning documentation is completed for all missing collection items. Note: this is nearly complete.</li> <li>- Process and catalog analog and electronic records identified during the recent archives survey.</li> <li>- Begin developing the file plan required under Director's Order 11D (Records Management) using the existing archives as a framework.</li> </ul>
MUSEUM COLLECTIONS AND PARK ARCHIVES	All museum collection items are surveyed for condition and preserved and maintained per NPS standards for museum collections. Baseline documents for collection management specified in DO-28 and DO-24 are complete and up to date. All resource management projects include curation work required.	<ul style="list-style-type: none"> <li>- Complete Collection Condition Survey so the conservation needs are known and can be prioritized.</li> </ul>

**Table 3o. High-Priority Stewardship Activities for Priority Resource—Parkwide Resource Information and Climate Change Information**

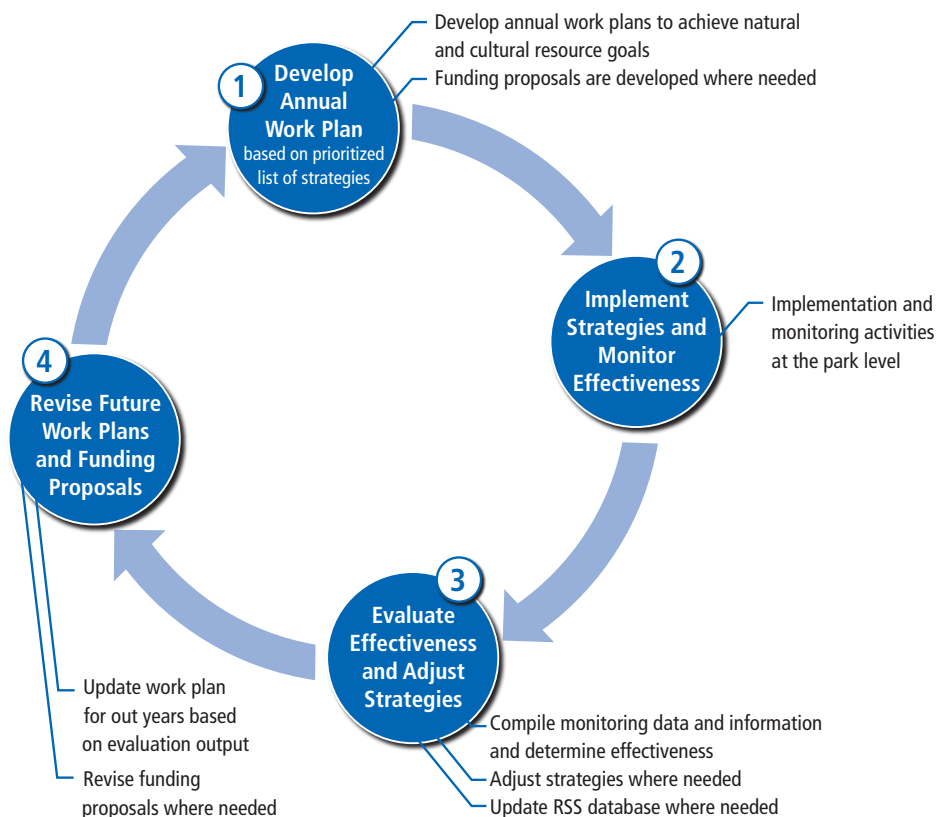
PRIORITY RESOURCE	SHORT-TERM GOAL	HIGH-PRIORITY STEWARDSHIP ACTIVITIES
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Better understand and track long-term climate trends and possible resource effects.	<ul style="list-style-type: none"> <li>- Maintain temperature, precipitation, storm frequency/intensity, and other applicable weather metrics from weather stations in the monument.</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Improve opportunities to access, use, and interact with natural and cultural resource data for park staff and public.	<ul style="list-style-type: none"> <li>- Create resource briefs and reports to inform staff and public.</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Improve data quality and management to support project management and inform resource management (digital records, etc.).	<ul style="list-style-type: none"> <li>- Develop and implement a data management protocol for proper resource data and report filing and sharing.</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Maintain an up-to-date, accessible research library system for park staff, and possibly visitors.	<ul style="list-style-type: none"> <li>- Update digital, online, and physical library system to include significant/prominent information relative to the monument.</li> </ul>

# ONGOING IMPLEMENTATION OF THE RESOURCE STEWARDSHIP STRATEGY

The stewardship goals, activities, and other pertinent information of the resource stewardship strategy is managed and updated regularly using the RSS desktop application. This information will assist resource managers in determining what, how, when, and where resource management occurs in the monument and will assist the monuments' resource management staff in developing annual work plans. These work plans will be an important planning tool for park staff to determine what they will be able to realistically tackle over the coming years.

Long-term implementation of the resource stewardship strategy includes monument managers monitoring resource information and conditions in order to evaluate the effectiveness of resource stewardship strategies over time. Regular monitoring of RSS progress will provide monument managers an opportunity to evaluate whether the stewardship activities are making progress towards identified goals and consider whether adjustments are needed. See Figure 3 for more information on the cyclical nature of this process. In addition, routine communication with the public is another important aspect of the implementation process. These outreach efforts are intended to improve public awareness about the science and strategies used to protect the monument's diverse resources and values over time.

Figure 3. RSS Implementation Process



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## APPENDIX A: DEVILS TOWER NATIONAL MONUMENT COMPREHENSIVE LIST OF STEWARDSHIP STRATEGIES AND RESPECTIVE PRIORITIES

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
VEGETATION COMMUNITIES	<b>UPLAND FOREST, WOODLAND, AND MEADOW STEWARDSHIP.</b> Adaptively manage to maintain upland forest, woodland, and prairie in proportions within the historical range of variability through 2030, while preparing for potential longer-term, climate change-driven changes that may be difficult or impossible to resist.	Expand park knowledge base about upland vegetation community condition and trends via vegetation inventory, monitoring, and assessments.	<ul style="list-style-type: none"> <li>- Continue long-term vegetation monitoring of plant community composition and structure. (High)</li> <li>- Stay current on emerging information on climate change implications to regional plant species abundance and distribution. (Medium)</li> <li>- Identify and test the hardiness of suitable tree species for replacing bur oak in upland woodlands to inform long-term forest management planning. (Medium)</li> <li>- Develop and implement a protocol for monitoring and assessing seedling recruitment in meadows and the areal extent of woodland encroachment into meadows. (Low)</li> </ul>
VEGETATION COMMUNITIES	<b>UPLAND FOREST, WOODLAND, AND MEADOW STEWARDSHIP.</b> Adaptively manage to maintain upland forest, woodland, and prairie in proportions within the historical range of variability through 2030, while preparing for potential longer-term, climate change-driven changes that may be difficult or impossible to resist.	Regularly monitor and mitigate potential for crown fire and pine beetle outbreaks in upland forests and woodlands.	<ul style="list-style-type: none"> <li>- Apply mechanical thinning and/or prescribed fire to reduce risks of crown fires and pine beetle outbreaks and to improve the health of meadow communities. (High)</li> <li>- Conduct tribal consultation on any proposed upland vegetation management actions. (High)</li> <li>- Continue to cut and chunk pine beetle-infested trees, as needed. (Medium)</li> <li>- Conduct thorough forest assessment that quantifies risk of crown fire and pine beetle outbreaks and measures seedling recruitment in forests/woodlands. (Medium)</li> <li>- Regularly track the pine beetle overflight information (and other possible sources). (Low)</li> <li>- Identify priority trees and areas to chemically treat for pine beetle outbreaks. (Low)</li> </ul>
VEGETATION COMMUNITIES	<b>NONNATIVE FOREST PESTS.</b> Reduce the likelihood of the introduction of nonnative forest pests.	Work with local and regional land managers, neighboring property owners, and the public to help mitigate the spread of nonnative forest pests via information sharing, public education efforts, and direct management.	<ul style="list-style-type: none"> <li>- Collaborate with State of Wyoming emerald ash borer exclusion activities. (High)</li> <li>- Participate in regional and national forest pest tracking efforts. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
VEGETATION COMMUNITIES	<b>NONNATIVE FOREST PESTS.</b> Reduce the likelihood of the introduction of nonnative forest pests.	Develop and enforce park regulations that relate to inspecting or banning wood imported to the monument.	<ul style="list-style-type: none"> <li>- Update Superintendent's Compendium to address imported firewood. (High)</li> <li>- Actively enforce outside firewood ban in campground. (High)</li> <li>- Include language in special use permits to prevent import of firewood from outside the monument unless it has been certified pest-free. (High)</li> <li>- Pursue ways to provide certified pest-free firewood to DETO campers (through a CUA or other mechanism). (High)</li> </ul>
VEGETATION COMMUNITIES	<b>RIPARIAN STEWARDSHIP.</b> Steward riparian woodlands through adaptive management planning that acknowledges changing conditions from climate change, altered river flow regime from upstream dam/reservoir management, and other stressors.	Expand park knowledge base about riparian vegetation community condition and trends via vegetation inventory, monitoring, and assessments.	<ul style="list-style-type: none"> <li>- Assess relative abundance, density, and condition of riparian deciduous trees. (Medium)</li> <li>- Identify and test the hardiness of suitable regionally native tree species for replacing green ash to inform long-term riparian management planning. (Low)</li> </ul>
VEGETATION COMMUNITIES	<b>RIPARIAN STEWARDSHIP.</b> Steward riparian woodlands through adaptive management planning that acknowledges changing conditions from climate change, altered river flow regime from upstream dam/reservoir management, and other stressors.	Conduct interim direct management of riparian vegetation to help sustain corridor and resist stressors until riparian management plan is in place.	<ul style="list-style-type: none"> <li>- Conduct tribal consultation on any proposed riparian vegetation management actions. (High)</li> <li>- Until riparian management plan is in place, plant and irrigate native riparian trees and fence out deer, as needed. (Medium)</li> </ul>
VEGETATION COMMUNITIES	<b>RIPARIAN STEWARDSHIP.</b> Steward riparian woodlands through adaptive management planning that acknowledges changing conditions from climate change, altered river flow regime from upstream dam/reservoir management, and other stressors.	Develop a park riparian corridor management plan.	<ul style="list-style-type: none"> <li>- Develop a long-term riparian area management plan that accounts for climate change, forest pests, and altered river flow regime, and includes desired conditions for both canopy and understory composition and structure. Via TAR, CCRP can assist on climate implications. (High)</li> </ul> <p><i>Activity Note: This activity is also listed under the priority resource "Cultural Landscapes"</i></p>



PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
VEGETATION COMMUNITIES	<b>INVASIVE PLANTS.</b> Maintain abundance proportion of exotic/ invasive plants at low level (<10%) in identified priority areas and keep noxious weeds in other areas at socially acceptable levels.	Regularly monitor invasive plant species and extent in park, and prioritize species and areas for treatment.	<ul style="list-style-type: none"> <li>- Regularly identify and update priority invasive plant species list, to include new species threats that will receive priority treatment attention. (High)</li> <li>- Conduct parkwide invasive plant inventory (extent, species) to inform management decisions. (Medium)</li> <li>- Identify and update priority areas of invasive plant infestation to guide annual treatment workplans. (Medium)</li> </ul>
VEGETATION COMMUNITIES	<b>INVASIVE PLANTS.</b> Maintain abundance proportion of exotic/ invasive plants at low level (<10%) in identified priority areas and keep noxious weeds in other areas at socially acceptable levels.	Work regularly with NPS programs to treat and eradicate invasive plants prioritized for treatment.	<ul style="list-style-type: none"> <li>- Continue to work with Northern Great Plains Invasive Plant Management Team (NGP IPMT) to apply integrated pest management approach to regularly treat identified priority invasive species and areas. (High)</li> <li>- Conduct annual winter planning meeting that includes park, NGP IPMT, NGP fire, and NGP Network to coordinate annual vegetation management efforts (i.e., prescribed fire, thinning, invasive plant control, restoration, etc.) (High)</li> <li>- Ensure tribes are informed of herbicide use in/near traditional plant gathering areas through the plant gathering agreements. (High)</li> <li>- Conduct regular native seed collection and pursue in-park native plant propagation program. (Medium)</li> </ul>
VEGETATION COMMUNITIES	<b>INVASIVE PLANTS.</b> Maintain abundance proportion of exotic/ invasive plants at low level (<10%) in identified priority areas and keep noxious weeds in other areas at socially acceptable levels.	Pursue collaboration and partnerships with surrounding land managers, agencies, and property owners on invasive plant control.	<ul style="list-style-type: none"> <li>- Continue to work with county on development of county noxious weed list and invasive plant treatment. (Low)</li> <li>- Communicate and collaborate with surrounding private property owners regarding invasive plant management actions. (Low)</li> <li>- Continue to collaborate with conservation corps, boy scouts, and volunteer groups to conduct invasive plant control. (Low)</li> </ul>
VEGETATION COMMUNITIES	<b>INVASIVE PLANTS.</b> Maintain abundance proportion of exotic/ invasive plants at low level (<10%) in identified priority areas and keep noxious weeds in other areas at socially acceptable levels.	Expand public education/awareness efforts on invasive plants via park education and interpretation programming.	<ul style="list-style-type: none"> <li>- Incorporate information on invasive plants and the importance of native vegetation communities in park interpretation and education programming. (Low)</li> <li>- Share invasive plant inventory information publicly via website and social media. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
WILDLIFE COMMUNITIES	Improve wildlife habitat and connectivity, and adapt to changes in biodiversity and species viability that cannot be resisted.	Improve wildlife habitat and connectivity, and adapt to changes in biodiversity and species viability that cannot be resisted.	<ul style="list-style-type: none"> <li>- Continue to work with neighboring landowners to expand the use of wildlife-safe fence along park boundaries. (Medium)</li> <li>- Consult with tribes on Traditional Ecological Knowledge (TEK) on wildlife and habitat. (Medium)</li> <li>- Develop and implement a park strategy/protocol on dead and downed wood (snags, etc.). (Medium)</li> </ul>
WILDLIFE COMMUNITIES	Minimize adverse human-wildlife interactions and their effects, while considering climate change influences on visitor and wildlife behavior.	Improve understanding of human-wildlife interactions in the monument.	<ul style="list-style-type: none"> <li>- Assess the risk of visitor use activities in park on white-nose syndrome transmission. (High)</li> <li>- Seek assistance from NRSS Office of Education and Outreach to develop a strategy to reduce/prevent human-wildlife interactions. (Low)</li> <li>- Identify/track climate change-driven changes in visitor behavior (e.g., expanding shoulder seasons and expansion into new areas of the monument at times of peak visitation) that influence risk of adverse interactions. (Low)</li> </ul>
WILDLIFE COMMUNITIES	Minimize adverse human-wildlife interactions and their effects, while considering climate change influences on visitor and wildlife behavior.	Improve enforcement, education, and response regarding human-wildlife interactions in the monument to actively and passively help reduce visitor disturbances of wildlife behavior.	<ul style="list-style-type: none"> <li>- Continue falcon climbing closure. (High)</li> <li>- Continue law enforcement capacity to ensure enforcement of park regulations that help protect wildlife and habitat (speeding, closures, etc.). (High)</li> <li>- Develop a protocol for responding to human-wildlife interactions in park. (High)</li> <li>- Incorporate wildlife education/awareness in the comprehensive sign management plan. (High)</li> <li>- Expand interpretation and outreach program efforts to help reduce adverse effects of human-wildlife interactions. (Low)</li> </ul>
WILDLIFE COMMUNITIES	Improve climate change-informed understanding of long-term viability of federally listed Devils Tower wildlife species with aim to assist in population recovery within potential ranges under climate change.	Improve climate change-informed understanding of long-term viability of federally listed Devils Tower wildlife species with aim to assist in population recovery within potential ranges under climate change.	<ul style="list-style-type: none"> <li>- Incorporate revised information from Biological Opinion of NLEB into update of fire management plan and snag protocol. (High)</li> <li>- Collaborate with Wyoming Natural Diversity Database to identify NLEB hibernacula. (High)</li> <li>- Conduct assessment of current status and expected climate change impacts on proposed or candidate T&amp;E species that occur or are likely to occur at DETO. (High)</li> </ul>
WILDLIFE COMMUNITIES	Improve understanding of local and regional trends and projections in aquatic and terrestrial wildlife abundance, behavior, distribution, and migration.	Collaborate with external agencies and institutions to gather and share information on aquatic and terrestrial wildlife species, and their abundance, behavior, distribution, and migration.	<ul style="list-style-type: none"> <li>- Collaborate with Wyoming Natural Diversity Database on tracking bat occurrence and habitat use at DETO. (High)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
WILDLIFE COMMUNITIES	Improve understanding of local and regional trends and projections in aquatic and terrestrial wildlife abundance, behavior, distribution, and migration.	Conduct wildlife monitoring, inventories, and assessments to better understand condition and trends of aquatic and terrestrial wildlife abundance, behavior, distribution, and migration.	<ul style="list-style-type: none"> <li>- Cyclically monitor the prairie dog colony. (High)</li> <li>- Cyclically monitor peregrine falcons. (High)</li> <li>- Cyclically monitor bats. (High)</li> <li>- Cyclically monitor breeding birds (I&amp;M). (High)</li> <li>- Cyclically monitor amphibians. (Medium)</li> <li>- Stay current on emerging information on climate change implications for wildlife abundance and distribution. (Medium)</li> <li>- Conduct detailed, scenario-based, climate change vulnerability assessments on identified wildlife species of management concern (bats, peregrines, etc.). (Medium)</li> </ul> <p><i>Activity Note: Such assessments would build on the qualitative work done to date (summarized in the 2019 DETO scenario planning report), and entail quantitative assessment of 1) the implications common to all or most climate-resource scenarios, and 2) the highly consequential implications of specific scenarios.</i></p> <ul style="list-style-type: none"> <li>- Cyclically monitor deer. (Low)</li> <li>- Cyclically monitor porcupines. (Low)</li> </ul>
WILDLIFE COMMUNITIES	Respond to the threats posed by nonnative, undesirable wildlife species via climate change-informed research and active response.	Respond to the threats posed by nonnative, undesirable wildlife species via climate change-informed research and active response.	<ul style="list-style-type: none"> <li>- Develop and implement plan for undesirable wildlife species, such as feral cats, pigeons, invasive mussels, and others that may become a threat under a changing climate. (Medium)</li> <li>- Monitor for invasive aquatic wildlife species, such as Quagga mussels. (Low)</li> </ul>
WILDLIFE COMMUNITIES	Respond to the threats posed by wildlife disease via climate change-informed research and active response.	Respond to the threats posed by wildlife disease via climate change-informed research and active response.	<ul style="list-style-type: none"> <li>- Collaborate with Wyoming Natural Diversity Database on bat white-nose syndrome surveillance. (High)</li> <li>- Monitor prairie dog population for diseases. (High)</li> <li>- Develop and implement wildlife diseases monitoring / response protocol. (Medium)</li> <li>- Monitor deer population for diseases. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
WATER RESOURCES	Improve understanding of status and trends of park seeps, springs, and wetlands to inform stewardship needs (quantity, locations, and condition/quality).	Conduct inventory, monitoring, studies, and assessments to improve understanding of park seeps, springs, and wetlands.	<ul style="list-style-type: none"> <li>- Identify locations of seeps, wetlands, and springs and publish and disseminate. (High)</li> <li>- Gather flow data from springs. (Medium)</li> <li>- Complete monitoring protocol for spring flows, water quality parameters, wetland plants, wetland extent, and frequency of monitoring needs. (Medium)</li> <li>- Compile information on external development that may affect surface and groundwater hydrology. (Medium)</li> <li>- Cyclically monitor wetlands, seeps, and springs on schedule identified in the water resource monitoring protocol. (Low)</li> <li>- Conduct isotope study for springs to determine spring origin and risk of outside activities. (Low)</li> <li>- Assess all collected spring, wetland, and seep monitoring data to determine hydro connectivity, condition, etc. (Low)</li> </ul>
WATER RESOURCES	Improve understanding of status and trends of Belle Fourche River hydrology, water quality, and bank erosion.	Improve understanding of status and trends of Belle Fourche River hydrology, water quality, and bank erosion.	<ul style="list-style-type: none"> <li>- Cyclically monitor Belle Fourche pH, temp, DO, conductivity, discharge, and turbidity (3 year interval). (High)</li> <li>- Cyclically monitor river bank and channel morphology. (High)</li> <li>- Assess historic river channel dynamics using existing historic data (e.g., aerial imagery) to inform future potential change in alignment as it relates to boundary issues. (High)</li> <li>- Compile BOR dam release data, plans, and protocol to better anticipate flow variations. (Medium)</li> </ul>
WATER RESOURCES	Improve park ability to respond to stressors that would alter flows and degrade water quality in the Belle Fourche River and springs and seeps.	Regularly engage with any applicable external agency or entity that plays a role in streamflows or water rights in the Belle Fourche River basin to improve awareness of flow and water rights status and to pursue opportunities to minimize adverse effects to the Belle Fourche River ecology and hydrology.	<ul style="list-style-type: none"> <li>- Engage in compliance processes of external development projects (e.g., as cooperating agency) to increase NPS voice and awareness in local/regional projects that affect park surface and groundwater hydrology. (High)</li> <li>- Participate in the local watershed council to consider ways to reduce water quality degradation in the Belle Fourche River. (Medium)</li> <li>- Collaborate with BOR to discuss dam release options that factor in climate change and ecological needs. (Medium)</li> <li>- Collaborate with state and other agencies to develop a comprehensive groundwater monitoring strategy. (Low)</li> <li>- Regularly monitor all new or amended water rights applications at state engineer's office. (Low)</li> <li>- Regularly participate with BOR stakeholder meetings. (Low)</li> <li>- Communicate with state engineer on compact delivery requirements and impact water rights. (Low)</li> </ul>



PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
WATER RESOURCES	Adaptively manage wetlands through 2030 to improve condition and explore the feasibility of restoring wetlands over the long-term under climate change.	Improve understanding of wetland extent, functionality, and condition to guide short-term adaptive management and help inform changes in long-term management needs.	<ul style="list-style-type: none"> <li>- Work with Colorado State University and/or other institutions to assess wetland conditions in the monument. (Medium)</li> <li>- Conduct a detailed, scenario-based climate change vulnerability assessment of wetlands and associated springs to inform long-term management. (Medium)</li> </ul> <p><i>Activity Note: This assessment would build on the qualitative work done to date (summarized in the 2019 DETO scenario planning report), and entail quantitative assessment of 1) the implications common to all or most climate-resource scenarios, and 2) the highly consequential implications of specific scenarios.</i></p> <ul style="list-style-type: none"> <li>- Conduct invasive plant control measures in wetlands to help sustain wetland conditions in the short-term and adjust the invasive plant control accordingly when a climate-informed, long-term wetland management strategy is in place. (Low)</li> </ul>
WATER RESOURCES	Adaptively manage wetlands through 2030 to improve condition and explore the feasibility of restoring wetlands over the long-term under climate change.	Plan for long-term wetland management under climate change and other stressors.	<ul style="list-style-type: none"> <li>- Work with Colorado State University to develop wetland restoration plan for Tarpot, and other possible wetlands that would be viable under various climate futures. (Medium)</li> <li>- Consult with tribes on wetland management actions (TEK, traditional uses). (Medium)</li> </ul>
WATER RESOURCES	Explore feasibility of restoring developed springs to natural conditions over the long-term under climate change.	Explore feasibility of restoring developed springs to natural conditions over the long-term under climate change.	<ul style="list-style-type: none"> <li>- Complete the Determination of Eligibility of spring infrastructure to inform management. (Medium)</li> <li>- Assess potential natural resource implications of altering or not altering developed spring infrastructure under multiple climate futures. (Medium)</li> <li>- Consult with tribes on springs/seeps management actions (TEK, traditional uses). (Medium)</li> <li>- Conduct geophysical study of Tarpot and Hidden Springs to locate shallow aquifers and subsurface infrastructure. (Low)</li> </ul>
WATER RESOURCES	Improve management of stormwater throughout the monument.	Assess stormwater flows in developed areas of park for flooding, erosion, and other indicators of insufficient stormwater management design or capacity.	<ul style="list-style-type: none"> <li>- Identify and prioritize locations of stormwater problems. (High)</li> <li>- Evaluate stormwater culvert capacity throughout park relative to extreme rainfall events and/or large fires (and resulting run-off) that may occur under future climate conditions. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
WATER RESOURCES	Improve management of stormwater throughout the monument.	Directly manage stormwater in areas identified to have insufficient stormwater management design or capacity.	<ul style="list-style-type: none"> <li>- Incorporate treatment recommendations for culverts in Historic Structures Report update. (High)</li> <li>- Develop stormwater run-off management plan that considers the potential impacts of climate change and other stressors on run-off. (Medium)</li> <li>- Treat priority stormwater run-off trouble sites with necessary earthwork and infrastructure to address localized flooding. (Medium)</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Increase and improve understanding of geologic resources at the monument.	Encourage geologic research by universities and other geologic science institutions.	<ul style="list-style-type: none"> <li>- Pursue technical assistance request with Geologic Resources Division (GRD) to increase staff/info capacity at park to help facilitate geologic research on tower formation, columnar jointing, erosion dynamics, etc. (fieldwork and reporting out). (Medium)</li> <li>- Work with GRD and other NPS geologists to develop priorities of geologic research needs at the monument. (Medium)</li> <li>- Do active outreach to research institutions in park's contact list (and beyond) to promote interest in geologic research in the monument. (Medium)</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Increase and improve understanding of geologic resources at the monument.	Expand geologic science expertise, knowledge, and/or representation in park staffing.	<ul style="list-style-type: none"> <li>- Hire local geology expert to instruct interpretive seasonal staff on geologic science in the monument. (Medium)</li> <li>- Work with Geoscientists in the monument Program (GRD) to bring in a geology intern. (Low)</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Improve understanding of paleontological resources at the monument.	Encourage paleontological research by universities and other geologic science institutions.	<ul style="list-style-type: none"> <li>- Pursue technical assistance request with GRD to increase staff/info capacity at the monument to help facilitate paleontological research (fieldwork and reporting out). (High)</li> <li>- Do active outreach to research institutions in park's contact list (and beyond) to drum up interest in paleontological research for known paleontological sites in the monument. (Low)</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Improve understanding of paleontological resources at the monument.	Gather information on presence and condition of paleontological resources from existing NPS sources, partners, and tribes.	<ul style="list-style-type: none"> <li>- Update paleontological resource inventory. (High)</li> <li>- Reach out to tribes to seek tribal information sources and tribal interpretation of paleontological resources. (High)</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Minimize risk for geohazard potential to address visitor safety.	Minimize rockfall potential along the tower trail.	<ul style="list-style-type: none"> <li>- Assess rockfall potential around tower to identify priority/trouble areas on tower and priority/trouble areas on tower trail. (High)</li> <li>- Develop rockfall hazard management protocol. (High)</li> <li>- Pursue technical mechanisms or data collection applications for climbers to more easily share geohazard information to inform geohazard management. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Improve education/ interpretation of geologic resources/ hazards at the monument.	Improve education and interpretation of geologic resources, processes, and hazards at the monument.	<ul style="list-style-type: none"> <li>- Incorporate geologic science into park interpretation programs to emphasize understanding of geologic features, processes, hazards, and effects of visitor use on geology. (Medium)</li> <li>- Incorporate geologic resource information into park's story maps and/or other interactive applications. (Low)</li> </ul>
GEOLOGIC RESOURCES AND PALEONTOLOGICAL RESOURCES	Preserve geologic and paleontological features and processes (including soils) while minimizing human-caused degradation from visitor use, park facilities/operations, and climate change.	Ensure appropriate protocols in place and implemented to protect geologic resources and paleontological discoveries, particularly in relation to exposure to climate change-enhanced fire, flood erosion, etc.	<ul style="list-style-type: none"> <li>- When paleontological resources are located, evaluate vulnerability in field and take appropriate actions on collection and recording. (High)</li> <li>- Conduct detailed, structured, scenario-based vulnerability assessments of the major known paleontological sites that assesses exposure and sensitivity of a site to potential increases in visitation, erosion, wildfire, and climate change (and include a climate scenario-based approach). (High) <i>Activity Note: This assessment would build on the scenario work done to date (summarized in the 2019 DETO scenario planning report), and entail site-specific assessment of 1) the implications common to all or most climate-resource scenarios, and 2) the highly consequential implications of specific scenarios.</i></li> <li>- Explore possible strategies at other NPS units and NRSS OEO that are effective in minimizing visitor poaching, displacing, or altering of geologic or paleontological resources. (Low)</li> <li>- Develop and implement a protocol that addresses visitor poaching, displacing, or altering of geologic and paleontological resources. (Low)</li> <li>- Conduct paleontological surveys and BAER actions after prescribed fires or wildfires. (Low)</li> </ul>
NIGHT SKIES	Improve understanding of the condition of the night sky and nocturnal environment.	Update the understanding and track the evolution of the condition of the night sky resource.	<ul style="list-style-type: none"> <li>- Work with Natural Sounds and Night Skies Division (NSNSD) to obtain geospatial maps of predicted sky conditions for the monument and adjacent lands. (High)</li> <li>- Work with NSNSD to obtain sky quality meter measurements of the prominent light domes visible from a high point in the monument, along with the bearings to the centers of the light domes. (Medium)</li> <li>- Work with NSNSD to document the best current conditions for seeing stars: obtain a measurement of sky glow every 10 years (unless conditions changed in interim per hand-held sky meters detecting 0.5 magnitudes per square arc-second). These measurements are made with the NSNSD all sky calibrated camera system. (Low)</li> <li>- Work with NSNSD to develop a long-term monitoring plan for changes in natural sky conditions as well as sky glow. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
NIGHT SKIES	Improve the condition of the night sky and nocturnal environment.	Reduce threats to the nocturnal environment and nighttime scenery from outside park boundaries.	<ul style="list-style-type: none"> <li>- Promote night sky friendly lighting ordinances in nearby communities. (Low)</li> </ul>
NIGHT SKIES	Improve the condition of the night sky and nocturnal environment.	Increase outreach and foster investment from the community and nearby partners in the shared night skies and nocturnal environment.	<ul style="list-style-type: none"> <li>- Continue adding information to the monument website and social media outlets that promote and educate about night skies and fully sustainable lighting practices. (High)</li> <li>- Continue to work with local astronomical organizations to offer night sky programs, educate about and promote the night sky and celestial objects. (Medium)</li> <li>- Continue to work with affiliated tribes to offer night sky programs, educate about and promote the night sky and celestial objects. (Medium)</li> <li>- Further develop night sky interpretive programming (e.g., star parties, annual astronomy festival) and consider leveraging off of other existing star party events in region. (Low)</li> <li>- Continue use of the Junior Ranger "Night Explorers" program. (Low)</li> <li>- Continue to work with nearby schools on curriculum-based school programs focused on night skies. (Low)</li> </ul>
NATURAL SOUNDS	Better characterize and understand baseline acoustic environment and its relationship and value to other resources.	Identify and monitor the condition of the acoustic resource.	<ul style="list-style-type: none"> <li>- Develop park soundscape management plan that incorporates indicators, thresholds, park operation BMPs, outreach/interpretation elements, etc. (High)</li> <li>- Work with NSNSD to develop soundscape monitoring strategy (sensitive areas, key issues, what are we monitoring for). (Medium)</li> <li>- Work with NSNSD to identify soundscape indicators and thresholds for management. (Medium)</li> <li>- Work with NSNSD to establish a monitoring protocol schedule. (Medium)</li> <li>- Work with NSNSD to regularly report data results, which would inform monitoring frequency and mitigation actions. (Medium)</li> <li>- Assess soundscape monitoring data and analyze soundscape effects on other park resources to inform management of those resources. (Medium)</li> </ul>
NATURAL SOUNDS	Reduce non-natural, unacceptable, and inappropriate noise in the monument environment to enhance condition of natural sounds.	Reduce noise from NPS activities / park operations.	<ul style="list-style-type: none"> <li>- Incorporate quiet pavements for PMIS statements regarding park road and road maintenance projects. (High)</li> <li>- Explore quieter alternatives to rumble strips near visitor center parking entrance to reduce noise. (High)</li> </ul>



PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
NATURAL SOUNDS	Reduce non-natural, unacceptable, and inappropriate noise in the monument environment to enhance condition of natural sounds.	Reduce noise from NPS activities / park operations.	<ul style="list-style-type: none"> <li>- Seek to phase out older noise-generating equipment via formalized green purchasing protocol updates. (Medium)</li> <li>- Host the NOSH study on engineering noise controls to help mitigate noise generation in NPS equipment and operations. (Low)</li> </ul>
NATURAL SOUNDS	Reduce non-natural, unacceptable, and inappropriate noise in the monument environment to enhance condition of natural sounds.	Reduce noise from visitor-based activities in the monument.	<ul style="list-style-type: none"> <li>- Develop and implement “quiet zone” strategy for both noise-sensitive areas and noisy areas of park. (Medium)</li> <li>- Actively educate climbers on noise generated from climbing and its effects on other park resources and experiences. (Medium)</li> </ul>
NATURAL SOUNDS	Reduce non-natural, unacceptable, and inappropriate noise in the monument environment to enhance condition of natural sounds.	Partner with neighboring communities, landowners, and other entities to reduce noise impacts	<ul style="list-style-type: none"> <li>- Update superintendent’s compendium for consistency on allowable overflights, if any. (High)</li> <li>- Pursue discussions with local airports, private runways, military base, and FAA to reduce overflight noise and enforce no-fly zone. (High)</li> <li>- Actively educate and encourage businesses outside the monument entrance to implement noise reduction mitigation strategies, including bus idling limits, Close Encounters “song” playing, concerts, etc. (Medium)</li> <li>- Pursue discussions with WYDOT to consider restrictions on jake-brake use on trucks on neighboring roads. (Low)</li> <li>- Actively encourage WYDOT to use quiet pavement on surrounding state highways. (Low)</li> </ul>
NATURAL SOUNDS	Improve public (other federal and state agency / NPS staff) understanding of the effects of non-natural sounds on park resources and experiences.	Develop soundscape interpretive and education activities that celebrate the monument’s acoustic environment and educate about noise impacts.	<ul style="list-style-type: none"> <li>- Develop consistent park standard/policy on messaging that does not promote external noise-generating activities, particularly promoted helicopter and military bomber overflights. Incorporate policy into superintendent’s compendium and applicable soundscape management plan and protocols. (High)</li> <li>- Include natural sound recordings and interpretive media into park interpretive programs. (Medium)</li> <li>- Include natural sound recordings and interpretive media into local school programs, library programs, etc. (Low)</li> <li>- Actively share information on the monument’s soundscape monitoring data/trends and affected resources with all external agencies that have jurisdiction over noise-generating sources. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
SCENIC VIEWS - INTERNAL - EXTERNAL	The monument has knowledge and information of monument scenic views, and protects, improves, and monitors the condition of views important for natural scenery and cultural resources both within and across park boundaries to maintain or improve visual character.	KNOWLEDGE. Inventory and monitor park views to assess changing scenic view conditions.	<ul style="list-style-type: none"> <li>- Complete a technical assistance request to the Air Resources Division Visual Resource Program for a visual resource inventory to establish baseline condition of selected views. (High)</li> <li>- Identify views important to the monument purpose, visitor, cultural landscapes inventories, and tribal values. Include tribal consultation. (High)</li> <li>- Conduct a visual resource inventory using the NPS ARD inventory process to establish baseline condition of selected views by documenting scenic quality and view importance. (High) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Assess vulnerability of park views using NPS ARD guidance to understand protections and threats. Apply geospatial data tool. (High)</li> <li>- Repeat visual resource inventory every 5-10 years or as landscape changes are observed, to monitor changes in condition. (Medium) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Monitor the lawsuit concerning cell towers and sacred sites for policy changes. (Low)</li> </ul>
SCENIC VIEWS - INTERNAL - EXTERNAL	The monument has knowledge and information of scenic views in the monument, and protects, improves, and monitors the condition of views important for natural scenery and cultural resources both within and across park boundaries to maintain or improve visual character.	Protect and improve internally. To the extent possible within the monument, minimize changes, visual contrast, and intrusions to views. (Natural and Cultural)	<ul style="list-style-type: none"> <li>- Incorporate written BMPs in applicable contracts to reduce impacts to scenic views impacts. (High)</li> <li>- Develop visual resource management strategy which incorporates data from view inventory and CLI, and considers climate change, visitor experience, and visual intrusions within the monument boundary. (Medium)</li> <li>- Inquire about including views in FMSS to conduct cyclic maintenance of views. (Medium) <i>Activity Note: Associated activities could include clearing vegetation and infrastructure maintenance at viewpoints. (e.g., include views of Tower trail trees).</i></li> <li>- Develop park visual resource best practices and facility design guidelines. (Low) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Screen facilities, structures, signs, or other visual intrusions in the monument. Consider removal of man-made visual intrusions. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
SCENIC VIEWS - INTERNAL - EXTERNAL	The monument has knowledge and information of scenic views in the monument, and protects, improves, and monitors the condition of views important for natural scenery and cultural resources both within and across park boundaries to maintain or improve visual character.	<b>COLLABORATE.</b> Collaborate with adjacent landowners, planners, developers, and other stakeholders to promote cooperative conservation of important views across park boundaries.	<ul style="list-style-type: none"> <li>- Maintain and grow partnerships with private and public landowners and other stakeholders for sake of scenic view preservation, anticipate external projects that impact views, and identify mitigation strategies. (Medium)</li> <li>- Develop a park partner and stakeholder strategy including scenic views, night sky, natural sounds, air quality, and climate change as cross boundary issues for collaboration. (Medium)</li> <li>- In partnership with stakeholders, establish best practices and/or design guidelines for adjacent landowners and inholders. (Low)</li> <li>- Pursue land acquisition or easement strategies from willing sellers. (Low)</li> </ul>
SCENIC VIEWS - INTERNAL - EXTERNAL	The monument has knowledge and information of scenic views in the monument, and protects, improves, and monitors the condition of views important for natural scenery and cultural resources both within and across park boundaries to maintain or improve visual character.	<b>SHARE.</b> Provide enhanced opportunities for visitor access and understanding importance of park views.	<ul style="list-style-type: none"> <li>- Establish park webcam(s) to provide a virtual experience of park scenery. (High)</li> <li>- Make select park views accessible to visitors of all ability levels. (High)</li> <li>- Ensure the interpretive theme for expansive views, dark night skies, and natural sounds (cross boundary resources) is included into park messaging, interpretive programs, panels, and kiosks. (e.g., "now and then" photos). (Medium)</li> <li>- Complete scenic photo gallery on the monument's website with the important views chosen for the visual resource inventory. (Low)</li> </ul>
AIR QUALITY	Improve the monument's overall air quality condition and increase understanding of air pollution impacts. Collaboration with others to perpetuate the best possible air quality for the protection of resources affected by air pollution.	<b>IMPROVE.</b> Be an environmental leader by reducing park air pollutant emissions, improving park sustainability and environmental management.	<ul style="list-style-type: none"> <li>- Establish and achieve GHG emissions reduction goals in Modified Environmental Management System Plan (MEMS). (High)</li> <li>- Continue implementing the monument's NPS Climate Friendly Park Action Plan and Environmental Management System. (High)</li> <li>- Develop park Energy, Waste, Water, and Lighting Guidelines for park staff and volunteers. (High)</li> <li>- Update the monument's greenhouse gas inventory to assess progress (2011–2021) and set new goals for the monument's Climate Friendly Parks Action Plan starting with 2022. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
AIR QUALITY	Improve the monument's overall air quality condition and increase understanding of air pollution impacts. Collaboration with others to perpetuate the best possible air quality for the protection of resources affected by air pollution.	<b>UNDERSTAND.</b> Improve understanding of air quality through compiling existing information, identifying sensitive resources, assessing future research needs, and educating staff and public about impacts to park resources.	<ul style="list-style-type: none"> <li>- Continue participation in the national dragonfly mercury project coordinated by ARD. (High) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Develop oil, gas, coal, and other threat summary. (High) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Disseminate air quality information to all park staff via seasonal orientation, staff handbook, etc. (Medium)</li> <li>- Develop a park air quality summary, including compilation of existing data, condition, threats, sensitive resources, and research. (Medium) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Ensure that key resource staff are familiar with and bookmark online park air quality information provided by ARD. (High) <i>Activity Notes: Air Quality info provided by ARD includes: park conditions and trends, regional conditions and trends, WICA Class I air profile, park sensitive plants, and nearby sources of air pollution.</i></li> <li>- <a href="https://www.nps.gov/subjects/air/park-conditions-trends.htm">https://www.nps.gov/subjects/air/park-conditions-trends.htm</a></li> <li>- <a href="https://www.nps.gov/subjects/air/national-summary.htm">https://www.nps.gov/subjects/air/national-summary.htm</a></li> <li>- <a href="https://www.nps.gov/subjects/air/airprofiles.htm">https://www.nps.gov/subjects/air/airprofiles.htm</a></li> <li>- <a href="https://irma.nps.gov/NPSpecies/Report">https://irma.nps.gov/NPSpecies/Report</a></li> <li>- <a href="https://edap.epa.gov/public/extensions/nei_report_2014dashboard.html#sector-db">https://edap.epa.gov/public/extensions/nei_report_2014dashboard.html#sector-db</a></li> <li>- Monitor/investigate for airborne toxic contaminants opportunistically in park biota such as insect, bird, bat, and fish species. (Medium) <i>Activity Note: ARD is contact for assistance.</i></li> <li>- Connect with NPS regional and nearby WICA Class I area air quality specialist towards understanding regional air quality issues. (Low)</li> <li>- Subscribe to and track the Wyoming's air quality division mailing list to stay current on new and existing sources of air pollution by receiving public notices, division updates, and regulatory information. (Low) <i>Activity Note: Go to following site for WY air quality information: <a href="http://deq.wyoming.gov/aqd/">http://deq.wyoming.gov/aqd/</a></i></li> </ul>



PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
AIR QUALITY	Improve the monument's overall air quality condition and increase understanding of air pollution impacts. Collaboration with others to perpetuate the best possible air quality for the protection of resources affected by air pollution.	<b>WORK COOPERATIVELY.</b> Collaborate with other federal, state, and regional planning organizations, and stakeholders to reduce air quality impacts in the monument from sources of air pollution.	<ul style="list-style-type: none"> <li>- With NPS ARD &amp; IMR assistance, work cooperatively with federal and state air quality agencies, regional air quality groups, and local stakeholders to reduce air quality impacts from sources of air pollution. (Low)</li> <li>- Partner with nearby developers, planners, county commissioners, industry, sister agencies, and other parks to increase awareness about the importance of park air quality, scenic views, natural sounds, and night sky protection. (Low)</li> </ul>
HISTORIC STRUCTURES	<b>INVENTORY AND DOCUMENTATION.</b> Inventory and documentation of the historic structures are up to date, meet the standards of Section 110 of the NHPA, and are recorded in relevant resource management databases. NRHP documentation is updated every 20 years.	Documentation is completed and up-to-date for all historic structures, and includes required components sufficient to meet policy requirements and management needs.	<ul style="list-style-type: none"> <li>- Conduct an architectural inventory and evaluation of Mission 66 resources, and enter them into LCS. Consult with SHPO over proposed DOEs. (High)</li> <li>- Record and evaluate, and complete DOE forms, for the springs, spring boxes, and wells. Note: also to be included in the CCC Era CLI. (Low)</li> </ul>
HISTORIC STRUCTURES	<b>INVENTORY AND DOCUMENTATION.</b> Inventory and documentation of the historic structures are up to date, meet the standards of Section 110 of the NHPA, and are recorded in relevant resource management databases. NRHP documentation is updated every 20 years.	All historic structures are entered into appropriate management databases (FMSS and LCS) and information is current.	<ul style="list-style-type: none"> <li>- Update Mission 66 structures in FMSS database if they are found NR-eligible. (High)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
HISTORIC STRUCTURES	<p><b>PLANNING.</b> Climate change implications are integrated into stewardship activities, planning and treatment of historic structures.</p>	<p>Planning and treatment documents incorporate interdisciplinary approaches related to climate adaptation.</p>	<ul style="list-style-type: none"> <li>- Incorporate a detailed, scenario-based climate change vulnerability assessment into historic structures report updates (Tower ladder, Mission 66 structures, historic roads and culverts, etc.). (Medium)</li> </ul> <p><i>Activity Note: This assessment would build on the qualitative work done to date (summarized in the 2019 DETO scenario planning report) and entail quantitative assessment of 1) the implications common to all or most climate-resource scenarios, and 2) the highly consequential implications of specific scenarios.</i></p> <ul style="list-style-type: none"> <li>- Prepare flood prediction modeling to establish an integrated landscape management approach to river flooding. (Low)</li> </ul> <p><i>Activity Note: This modeling would ideally be based on the divergent climate futures that underlie the climate-resource scenarios developed as part of 2018 DETO scenario planning and described in the 2019 DETO scenario planning report. Use GIS spatial data to support this analysis.</i></p>
HISTORIC STRUCTURES	<p><b>PRESERVATION.</b> Historic structures are preserved and maintained in good condition, with consideration for unavoidable disturbance or natural deterioration. Preservation treatments follow a long-term strategy for management based on significance, existing conditions, use, and other factors, including adaptation to climate change.</p>	<p>Preservation treatment strategies for historic structures are updated, considering climate change.</p>	<ul style="list-style-type: none"> <li>- Implement treatment recommendations of the Vanishing Treasures documentation. (High)</li> <li>- An updated Historic Structure Report is prepared for the CCC-era structures, including the Entrance Road. (Medium)</li> </ul> <p><i>Activity Note: This report would consider the divergent climate futures that underlie the climate-resource scenarios developed as part of 2018 DETO scenario planning and described in the 2019 DETO scenario planning report. The report will address the code capacity need issue, per fire/life safety standards for entrance/exits. Consider alternatives and potentially negotiate a building code based on voluntary upgrades (e.g., petition county fire marshal). (Relates to high-fire climate scenarios 3 and 4).</i></p> <ul style="list-style-type: none"> <li>- Prepare a Historic Structure Report for Mission 66 structures once they are inventoried and found National Register eligible. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
CULTURAL LANDSCAPES	<p><b>INVENTORY AND DOCUMENTATION.</b> The monument's cultural landscapes are inventoried and documented with up-to-date information that meets the standards of Section 110 of the NHPA, and are recorded in relevant resource management databases.</p>	<p>Park has current inventory and documentation sufficient to thoroughly understand and identify each of the monument's cultural landscapes and their contributing features. Inventory information is recorded in management databases.</p>	<ul style="list-style-type: none"> <li>- Complete a CLI of the Tower Trail and Red Beds Trail landscape. (underway, and linked to the AIP project). (High)</li> <li>- Complete a CLI for the Ethnographic landscape (park-wide). (High)</li> <li>- Complete a CLI for the Mission 66 Administrative Area and Campground Landscape. (Medium)</li> <li>- Complete a CLI for the CCC-era landscape. Include the springs, spring boxes, and wells, and incorporate the Tower Trail and Red Beds trails CLI. (Medium)</li> <li>- Explore potential for agreements with nearby agencies or universities or other parks for historic landscape architect support as needed. This applies to all priority resources. Use Service First agreement and other interagency agreements. (Medium)</li> <li>- As CLIs are completed, code appropriate facilities in FMSS as part of cultural landscapes. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
CULTURAL LANDSCAPES	<p><b>PRESERVATION.</b> Cultural landscapes are preserved and maintained in good condition, with consideration for unavoidable disturbance or natural deterioration. Preservation treatments follow a long-term strategy for management based on significance, existing conditions, use, and other factors, including adaptation to climate change.</p>	<p>Cultural landscapes are managed by following up-to-date treatment recommendations and strategies that meet NPS policy and guidelines.</p>	<ul style="list-style-type: none"> <li>- Ensure maintenance staff (and staff in general) are made aware of associated elements, sites, structures, etc. for cultural landscapes as they are documented. (High) <i>Activity Note: Work with region to develop interim treatment guidance (pending CLRs) and incorporate this into SOWs as required.</i></li> <li>- Develop a long-term riparian area management plan that accounts for climate change, forest pests, and altered river flow regime, and includes desired conditions for both canopy and understory composition and structure. Via TAR, CCRP can assist on climate implications. (Medium) <i>Activity Note: This activity is also listed under the priority resource "Vegetation Communities"</i></li> <li>- As CLRs are completed, enter into FMSS cyclic and other treatment information as it is completed, as appropriate. (Medium)</li> <li>- Complete a CLR for the Ethnographic landscape (park-wide). (Low) <i>Activity Note: This report would consider the divergent climate futures that underlie the climate-resource scenarios developed as part of 2018 DETO scenario planning and described in the 2019 DETO scenario planning report.</i></li> <li>- Work with natural resources and I&amp;M to identify potential overlap in vegetation treatment approaches, identify other regional examples. (Low)</li> <li>- Complete a CLR for the CCC-era landscape. Note: Explore the potential for including the Tower Trail and Red Beds Trail landscape in a CCC or Mission 66 CLR. (Low)</li> <li>- Complete a CLR for the Mission 66 Administrative Area and Campground Landscape. Note: Explore the potential for including the Tower Trail and Red Beds</li> <li>- Trail landscape in a CCC or Mission 66 CLR. (Low)</li> </ul>



PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
ARCHEOLOGICAL RESOURCES	<b>DOCUMENTATION.</b> Archeological sites are identified and inventoried to inform management decisions at the monument. A parkwide survey with archeological site forms are up-to-date.	Archeological survey and site information is updated to address current research questions, record newly exposed sites, and update Determinations of Eligibility (DOE) forms for archeological sites.	<ul style="list-style-type: none"> <li>- Submit Technical Assistance Requests to the regional archeology office as needed to continue work toward conducting an updated survey and completing DOEs forms. (High)</li> <li>- Conduct archeological survey to cover about 336 acres per year, resulting in completed parkwide survey in about five years, including summary. Obtain DOEs for newly discovered sites, and update DOEs for known sites that lack signed DOE documentation on file. (High)</li> <li>- Update spatial data for archeological sites during survey. (High)</li> <li>- Data recovery: Known prehistoric pictographs are recorded with updated technology, such as LiDAR or other available photographic technologies. (High)</li> <li>- Share all DETO GIS data with IMR, labeled as sensitive for cultural resources. (Medium)</li> <li>- Review and validate/update ASMIS records. ASMIS entries should include revisitation schedules for each site. (Medium)</li> <li>- Consult with Regional Archeologist regarding "Certificate of Availability" for archeological reports that describes its ARPA confidentiality level. (Medium)</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>DOCUMENTATION.</b> Archeological sites are identified and inventoried to inform management decisions at the monument. A parkwide survey with archeological site forms are up-to-date.	Archeological resource databases (ASMIS, FMSS) are up to date and include all archeological resources, as required.	<ul style="list-style-type: none"> <li>- Determine which archeological sites need to be entered in FMSS. (Low)</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>DOCUMENTATION.</b> Archeological sites are identified and inventoried to inform management decisions at the monument. A parkwide survey with archeological site forms are up-to-date.	A formal archeological site monitoring program is established. This program, which recognizes and monitors for climate change-related changes in impacts from enhanced visitation and potential increases in erosion and wildfire, includes updated condition assessments, determinations of eligibility (DOEs), confirm/update geospatial data for boundaries, and updated site forms as appropriate.	<ul style="list-style-type: none"> <li>- Establish a formal, regular condition assessment program. Regional staff currently assists ad hoc. Monitor vulnerable sites - such as sensitive sites exposed to increasing visitation, erosion, or wildfire risk - more frequently, or collect those sites to fully protect them and prevent them from being lifted. Develop management recommendations for at-risk sites or site assessed as other than good condition. The intent is to improve site condition if possible, maintain, or monitor and determine a course of action as appropriate. (Medium)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
ARCHEOLOGICAL RESOURCES	<b>RESEARCH.</b> Research on archeological resources is conducted to inform resource management (e.g., obsidian research).	Climate change vulnerabilities for archeological resources are identified.	<ul style="list-style-type: none"> <li>- During archeological site assessments, include observations of site-specific climate sensitivities (e.g., site slope, soil, and other factors related to the impact of extreme rainfall events). Use this site-specific information to gain a broad understanding of climate change vulnerabilities across sites. (Low)</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>PRESERVATION.</b> Archeological sites are protected in an undisturbed condition with appropriate protocols in place to address inadvertent finds or exposure due to fire or erosion.	The monument follows management recommendations for archeological sites assessed in fair or poor condition. Site condition is improved where possible, maintained, and monitored to protect data potential, or determine an alternative course of action. Sites vulnerable to off-trail trampling are protected using best practices, such as barriers (benches, branches, etc.) and signage to discourage visitor access.	<ul style="list-style-type: none"> <li>- Ensure that updated archeological survey and condition assessment program needs are included in planning and management documents. (Medium)</li> <li>- Explore ways to increase the monitoring and protection of archeological sites near trails using trained volunteers, students, or others who can do this on a regular basis. (e.g., positioned at access points or roving on trails.) Reconsider visitor signage concerning areas to avoid and places where they can go off-trail. A potential "Site Stewards" program includes agreements about confidentiality. (Low)</li> <li>- Begin training (e.g., integrated resources compendium for annual seasonal training) on archeological resources protection, ARPA, and interpretation and outreach for park staff. Provide on a regular basis; e.g., resource briefs at quarterly all-staff meetings. (Low)</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>PRESERVATION.</b> Archeological sites are protected in an undisturbed condition with appropriate protocols in place to address inadvertent finds or exposure due to fire or erosion.	A formalized prescribed fire program with regard to archeological survey and protection is in place.	<ul style="list-style-type: none"> <li>- Update the Fire Management Plan to address archeological survey needs and protection. Include GIS data and an overlay analysis, consulting with Regional GIS. Design/ implement prescribed fire treatments based on site wildfire vulnerabilities characterized in an archeology site vulnerability analysis. Include tribal and SHPO consultation. (High)</li> </ul>
ARCHEOLOGICAL RESOURCES	<b>OUTREACH.</b> Outreach, education, and interpretation of archeological resources occurs to raise awareness of their importance and need for protection in the context of the climate change-related challenges of 1) expanding visitation shoulder seasons and 2) potential increases in site exposure (from heavy precipitation and wildfire).	Develop interpretive waysides that improve public understanding of archeological resources.	<ul style="list-style-type: none"> <li>- Per the Accessibility Improvement Plan recommendations, explore interpretive methods (e.g., waysides, cast of objects) on the Tower Trail to improve public understanding of archeological resources and human history. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	<p><b>MANAGEMENT.</b> Park includes areas appropriate for ceremonial uses.</p> <p>Note: this deals with the encroachment of forest into the meadow at Joyner Ridge.</p>	Maintain areas for ceremonial use in the monument while consulting with tribes on how best to prepare for possible climate-driven changes in ceremonial areas.	<ul style="list-style-type: none"> <li>- Use prescribed fire and/or mechanical thinning to maintain open areas for ceremonial uses, consulting with tribes for appropriate timing and methods. Explore other strategies for keeping an open meadow if fire is not an option, including working with the TEK program. (High)</li> <li>- Ensure that special-use permits and compliance requirements for all special uses for traditional activities are completed well in advance. Discuss communal maintenance of structures (sweat lodge). (High)</li> <li>- Work with tribes to identify alternative areas suitable for ceremonies in the monument to prepare for potential climate-driven changes to existing ceremonial areas. (Low)</li> </ul> <p><i>Activity Note: This is most pertinent to the Spearfish climate-resource scenario of woody species expansion in the monument.</i></p>
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	<p><b>TRIBAL CONSULTATION.</b> The monument follows a thorough tribal consultation process that meets NPS policy and follows best practices.</p>	The monument has established a more proactive consultation approach that is more comprehensive in terms of all projects in the monument.	<ul style="list-style-type: none"> <li>- Establish a new consultation process of sending out a comprehensive list of all projects for the year and asking tribes which projects they want to be engaged in. Periodically update the list with new information during the year, particularly when consultation is needed. (High)</li> <li>- Make sure that tribal consultation is included in the scope of all projects, as applicable. This may involve inviting tribes as a cooperating agency. (High)</li> <li>- Work with other parks to share information about tribal consultation practices. (Medium)</li> <li>- Develop a written programmatic agreement with each tribe (or one comprehensive agreement with all tribes) that outlines streamlined consultation for certain types of undertakings. (IMR to share an example.) (Low)</li> </ul>
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	<p><b>TEK MANAGEMENT.</b> Park management decisions consider traditional ecological knowledge and practices to inform resource planning.</p>	The monument engages with tribes on planning, including incorporation of traditional ecological knowledge and understanding of climate change vulnerabilities.	<ul style="list-style-type: none"> <li>- Seek tribal input on activities and priorities identified in the RSS. (Medium)</li> <li>- Seek collaborative project planning with TEK through tribal consultation, collaborative implementation, and monitoring and maintenance. (Include this information in PMIS statements... see above activities concerning PMIS development.) (Medium)</li> <li>- Learn about tribal plans concerning climate change. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	TEK MANAGEMENT. Park management decisions consider traditional ecological knowledge and practices to inform resource planning.	Knowledge of consultation history and past and present practices guides ongoing consultation and park resource management.	<ul style="list-style-type: none"> <li>- Prepare a tribal consultation documentation database (incl. topics, meeting dates, agendas, decisions). (Medium)</li> <li>- Generate an internal history and continuity document for the monument that describes consultation history and practices, updated as required. This would be valuable for future Superintendents and Chiefs of Resource Management, and would assist in annual consultation reporting. (Low)</li> </ul>
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	KNOWLEDGE/ DOCUMENTATION. DETO has adequate and up-to-date knowledge and documentation of ethnographic resources and traditional uses to support planning, resource management, and tribal relationships. Traditional Cultural Property and National Register documentation is complete.	The extent of the monument as a traditional cultural property is determined.	<ul style="list-style-type: none"> <li>- Develop an SOP for cultural offerings; their protection, documentation, and criteria for removal. (High)</li> <li>- Prepare a Rapid Evaluation Assessment Procedure (REAP) to identify any additional traditional cultural groups, such as ranchers and other community members. (Low)</li> <li>- Determine if it would be appropriate to complete an NRHP Nomination Form for listing the tower as a traditional cultural property. Clarify with tribes on this and the status of other ethnographic resources (sweat lodge, Sun Dance grounds, etc.) and determine if formal documentation and nomination is appropriate and desirable. These other ethnographic resources may be contributing features to the Tower TCP or they may be separate. (Low)</li> <li>- Determine if the oral histories that were taken for an interpretive project are useful and appropriate as an ethnographic record, and if so then transcribe the full recordings. (Low)</li> <li>- Prepare a PMIS statement to request multiple Traditional Use Studies with tribes, as interested. (This includes wildlife, minerals, etc.) (Low)</li> </ul>
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	OUTREACH. Provide enhanced opportunities for visitor understanding of the monument as a sacred site and its traditional uses by reaching out to local communities.	Park staff support or facilitate discussions between tribal members and local climbing communities on the importance of the tower as a sacred site to improve the mutual understanding of these user groups.	<ul style="list-style-type: none"> <li>- Engage tribes in park messaging during the June voluntary climbing closure. (High)</li> <li>- Work with IMR GIS to develop a story map as an interpretive tool that can help increase awareness of the sacred importance of the monument. (Low)</li> <li>- Host a meeting to invite the climbing community and tribal members to attend to express why the voluntary June closure is important to them. (Low)</li> </ul>
SACRED SITES, TRADITIONAL USES, ETHNOGRAPHIC RESOURCES	MANAGEMENT. The monument continues to implement strategies to help minimize the number of climbers during the voluntary climbing closure in June.	Continue to reduce the number of climbers in June.	<ul style="list-style-type: none"> <li>- Update the climbing management plan to consider approaches to the voluntary climbing closure in June and incorporating outreach efforts and outcomes. (High)</li> </ul>



PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
HISTORY	<b>KNOWLEDGE.</b> The monument has sufficient knowledge and understanding of the monument's human history, including climbing history, to help inform park interpretation and management.	Resource management is guided by an up-to-date historic resource studies and an up-to-date NRHP nomination.	<ul style="list-style-type: none"> <li>- Complete a Historic Resource Study in 2019. (High)</li> <li>- Complete new NRHP documentation for newly evaluated structures, cultural landscapes, and TCPs, as CLIs and historic structures documentation. (High)</li> <li>- Update the DETO administrative history, and include climbing history and other recent knowledge since 2008 and gaps of information. (Medium)</li> <li>- Update existing documentation NRHP forms for historic structures. (Low)</li> </ul>
HISTORY	<b>KNOWLEDGE.</b> The monument has sufficient knowledge and understanding of the monument's human history, including climbing history, to help inform park interpretation and management.	Park has access to oral history transcripts from non-tribal individuals (ranchers, other locals) to inform historic contexts and resource management.	<ul style="list-style-type: none"> <li>- Collect additional oral history from non-tribal oral history. (Note: See Ethnographic Resources for additional info collection.) (Medium)</li> </ul>
MUSEUM COLLECTIONS AND PARK ARCHIVES	<b>ACCESS AND USE.</b> Organization, access, and usability to archives and records for park staff and public is maintained or improved.	The monument's staff has an understanding of how the collections are used and public access to the collections is increased.	<ul style="list-style-type: none"> <li>- Develop and implement a procedure to collect statistical data on the use of monument collections across multiple platforms. (This is done/used locally; improve this for reporting to IMR with data on use.) (Low)</li> <li>- Make the climbing database searchable for staff. Determine how to make this accessible to the public in the future. Note: determine who does this (museum collections staff or DETO). (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
MUSEUM COLLECTIONS AND PARK ARCHIVES	<p><b>KNOWLEDGE AND INVENTORY.</b> All museum collection items are accessioned and cataloged per NPS standards for museum collections. Baseline documents for the collection specified in DO-28 and DO-24 are complete and up to date.</p>	<p>The scope of the monument's collections is known and a statement for management is maintained. A committee is established to review accessions and deaccessions. Collections processing and cataloging is up to date.</p>	<ul style="list-style-type: none"> <li>- Determine if recently identified archives on the monument can be moved off the monument and curated elsewhere, or must remain. (High)</li> <li>- Ensure that Boards of Survey and deaccessioning documentation is completed for all missing collection items. Note: this is nearly complete. (High)</li> <li>- Process and catalog analog and electronic records identified during the recent archives survey. (High)</li> <li>- Begin developing the file plan required under Director's Order 11D (Records Management) using the existing archives as a framework. (High) <i>Activity Note: Ensure that new resource management projects, including permitted activities, include sufficient funding to catalog the resulting objects, specimens, and archives.</i></li> <li>- Develop a PMIS project for a Collection Condition Survey. (Medium) <i>Activity Note: Develop CCS approach with regional museum program staff. May require submission of a technical assistance request.</i></li> <li>- Complete an evaluation of the unique required fields in all catalog records to identify the extent of corrections needed (32%). Develop a strategy for completing the records updates incrementally. (e.g., adding detail to the ICMS record. This is ongoing...) (Medium)</li> <li>- Complete a more robust update of the Scope of Collection Statement (2015). (Low)</li> <li>- Review past research permits to determine if there are collections that have not been accessioned. If so, develop a plan to accession. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
MUSEUM COLLECTIONS AND PARK ARCHIVES	<b>PRESERVATION.</b> All museum collection items are preserved and maintained per NPS standards for museum collections. Baseline documents for collection management specified in DO-28 and DO-24 are complete and up to date.	All museum collection items are surveyed for condition and preserved and maintained per NPS standards for museum collections. Baseline documents for collection management specified in DO-28 and DO-24 are complete and up to date. All resource management projects include curation work required.	<ul style="list-style-type: none"> <li>- Complete Collection Condition Survey so the conservation needs are known and can be prioritized. (High) <i>Activity Note: Utilize professional conservators for treatment through the assistance of the Museum Services Program conservation staff.</i></li> <li>- Develop a PMIS project(s) for Collection Condition Survey for the items at the federal repositories (MORU, MWAC, and WACC) and improvements recommended in the CMP. (Medium) <i>Activity Note: DETO must prepare PMIS. Work with IMR staff to develop the scope of this survey, possibly doing one survey for multiple parks.</i></li> <li>- Begin working with non-federal repositories to secure information for Checklists. (possibly combine with above activity) (Medium)</li> <li>- Work with MWAC and MORU to better define the preventive conservation program currently in place. Ensure that Checklists reflect all collections, including archives, in each facility. Collaborate with regional staff and MORU staff and continue pursuing funding for a CCS and other core documents to establish the procedures critical for preventive conservation. (Low)</li> <li>- Develop an approach for a CCS at one of the five existing non-federal repository. (Low)</li> </ul>
MUSEUM COLLECTIONS AND PARK ARCHIVES	<b>PLANNING AND INTERPRETATION.</b> Park planning and interpretation incorporates the monument's museum collection to enhance integrated approaches to resource management and interpretation.	Park planning efforts address the value of museum collections, as applicable, and interpretive programming is supported by the display of museum objects to enhance public understanding of the monument.	<ul style="list-style-type: none"> <li>- Engage visitors with the collection, identify new ways to use the museum collection in interpretation (e.g., use replica props, encourage visiting off-site museum, mobile museum/VC as outreach, etc.). (Medium)</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Track, maintain, and share climate change information to expand staff and public understanding of climate change at the monument.	Better understand and track long-term climate trends and possible resource effects.	<ul style="list-style-type: none"> <li>- Periodically engage with CCRP, I&amp;M, and other climate change expertise to get updates on climate trends and projections for the monument. (Medium)</li> <li>- Maintain temperature, precipitation, storm frequency/intensity, and other applicable weather metrics from weather stations in the monument. (High)</li> <li>- Create opportunities for Citizen Science volunteers to monitor conditions of specific, climate-sensitive natural and cultural resources in the monument. (Low)</li> </ul>

PRIORITY RESOURCE	LONG-TERM GOAL	SHORT-TERM GOAL	STEWARDSHIP ACTIVITY AND PRIORITY
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Track, maintain, and share climate change information to expand staff and public understanding of climate change at the monument.	Improve public and NPS staff understanding of climate change and its effects.	<ul style="list-style-type: none"> <li>- Work with CCRP communications staff to develop and install interpretive panels explicitly on climate change, and better incorporate climate change into interpretation and education programs. (Medium)</li> <li>- Periodically engage with CCRP and other institutions (Climate Adaptation Science Centers, NCTC) to conduct presentations and training for park staff on climate change and climate change implications to park resources. (Medium)</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Track, maintain, and share climate change information to expand staff and public understanding of climate change at the monument.	Identify historical impacts and future vulnerabilities of climate change on priority resources.	<ul style="list-style-type: none"> <li>- Conduct spatial vulnerability analyses on key resources that identify areas vulnerable to climate change and potential refugia (both inside and outside park). (Low)</li> <li>- Work with partners to analyze historical climate impacts on key resources. (Medium)</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Effectively organize, maintain, use, and share resource data and documentation.	Improve opportunities to access, use, and interact with natural and cultural resource data for park staff and public.	<ul style="list-style-type: none"> <li>- Create resource briefs and reports to inform staff and public. (High)</li> <li>- Resource management staff present work in public forums, such as workshops, conferences, schools, etc. (Medium)</li> <li>- Develop opportunities for Citizen Science to occur in the monument, and incorporate into park resource management. (Low)</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Effectively organize, maintain, use, and share resource data and documentation.	Improve data quality and management to support project management and inform resource management (digital records, etc.).	<ul style="list-style-type: none"> <li>- Develop and implement a data management protocol for proper resource data and report filing and sharing. (High)</li> </ul>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Effectively organize, maintain, use, and share resource data and documentation.	Collect and document resource data via defensible scientific methods.	<ul style="list-style-type: none"> <li>- Establish and implement a peer review process for data collection protocols. (Medium)</li> </ul> <p><i>Activity Note: Another mechanism to achieve the overarching short-term goal for this activity would be to publish all data collection protocols as NPS Natural Resource Reports, which have a peer review process. At the other end, another possible activity would be to publish collected data in a form that requires peer review of the data themselves.</i></p>
PARKWIDE RESOURCE INFORMATION AND CLIMATE CHANGE INFORMATION	Effectively organize, maintain, use, and share resource data and documentation.	Maintain an up-to-date, accessible research library system for park staff, and possibly visitors.	<ul style="list-style-type: none"> <li>- Update digital, online, and physical library system to include significant/prominent information relative to the monument. (High)</li> <li>- Maintain park library by implementing a clear catalog system or record management system. (Medium)</li> </ul>



## CONTACT INFORMATION

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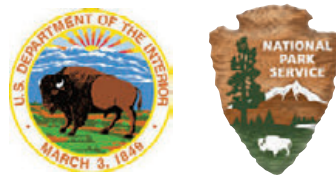
For more information about the Resource Stewardship Strategy for Devils Tower National Monument, contact

Superintendent  
Devils Tower National Monument  
P.O. Box 10  
Devils Tower, WY 82714

[DETO\\_superintendent@nps.gov](mailto:DETO_superintendent@nps.gov)







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 US administration.



# RSS

RESOURCE STEWARDSHIP STRATEGIES



BRIDGING SCIENCE AND MANAGEMENT FOR TODAY AND TOMORROW