United States
Department of
Agriculture

Forest Service
Rocky Mountain
Region

April 2013

ENVIRONMENTAL ASSESSMENT

FOR

CAVE AND ABANDONED

MINE MANAGEMENT FOR

WHITE-NOSE SYNDROME

Little brown bats in a hibernation cave.
Most of the bats exhibit fungal growth on their muzzles.
Photo by Nancy Heaslip, NY Dept of Environ. Conservation

Table of Contents

List of Figures and Tables

Definitions

Abandoned mines – inactive mine openings and adits that are on NFS lands but not on patented claims under the 1872 Mining Law.

Adit – a nearly horizontal passage leading into a mine.

Endemic – relating to a disease or pathogen that occurs regularly in the area or is maintained in the population without the need for external input.

Hibernacula –the shelter used by a hibernating bat.

Show caves – caves that are managed by a government or commercial organization and made accessible to the general public. Also called tourist caves, public caves, or commercial caves. They typically possess such features as constructed trails, guided tours, lighting, and regular operating hours.

Targeted opening – a cave or mine that would normally be closed but may be open under certain circumstances.

White-nose syndrome – an emerging disease affecting hibernating bats. It is named for the white fungus that infects the skin of the muzzle, ears, and wings of hibernating bats.

List of Acronyms

AMLs – abandoned mine lands

EA – environmental assessment

WNS – white-nose syndrome

Gd – *Geomyces destructans*

NFS – national forest system

SD – South Dakota

WY - Wyoming

CO - Colorado

KS - Kansas

DN – decision notice

FONSI – finding of no significant impact

CFR – code of federal regulations

IDT – interdisciplinary team

NSS – National Speleological Society

CRF – Cave Research Foundation

MSHA – Mine Safety and Health Administration

USFWS – U.S. Fish and Wildlife Service

FCRPA – Federal Cave Resource Protection Act

MOU – memoranda of understanding

CSS – Colorado Cave Survey

Chapter 1: Purpose and Need for Action

Introduction

National forests and grasslands in the Rocky Mountain region states of Colorado, Wyoming, South Dakota, and Kansas prepared this environmental assessment (EA) to analyze management options for caves and abandoned mine lands (AMLs) in response to the bat disease known as white-nose syndrome (WNS). WNS and the fungus that causes it – *Geomyces destructans* (Gd) – have not been confirmed in any of the four states as of March 2013.

The project record for this analysis is incorporated by reference. It contains specialist reports, meeting notes, maps, public comments, and technical information used in the analysis. The project record is available for review at the Rocky Mountain regional office in Golden, CO.

Purpose and Need for Action

The purpose and need for the proposed action is to reduce the potential for human introduction, spread, and impacts of Gd and WNS by providing management options for caves and AMLs on national forests and grasslands in Colorado, South Dakota, Wyoming, and Kansas.

Caves and AMLs in the Rocky Mountain region are currently closed to human entry to protect bat species from WNS by reducing the chance that humans would accidentally introduce Gd into areas used by bats. The closure order has been in place for approximately three years. It does not generally allow access for recreational activities.

Our understanding of WNS and its transmission has improved in the past three years, and this assessment gives us the opportunity to explore management approaches other than completely closing caves to human entry.

Scope

Environmental effects were analyzed on the forests and grasslands listed below. The analysis area is limited to the caves and AMLs on national forest system (NFS) lands on these administrative units.

- Black Hills National Forest (SD and WY)
- Shoshone National Forest (WY)
- Bighorn National Forest (WY)
- Grand Mesa, Uncompahgre, and Gunnison National Forests (CO)
- Medicine Bow and Routt National Forests and Thunder Basin National Grassland (CO and WY)
- White River National Forest (CO)
- Rio Grande National Forest (CO)
- San Juan National Forest (CO)
- Arapaho and Roosevelt National Forests and Pawnee National Grassland (CO)
- Pike and San Isabel National Forests and Cimarron and Comanche National Grasslands (CO and KS)

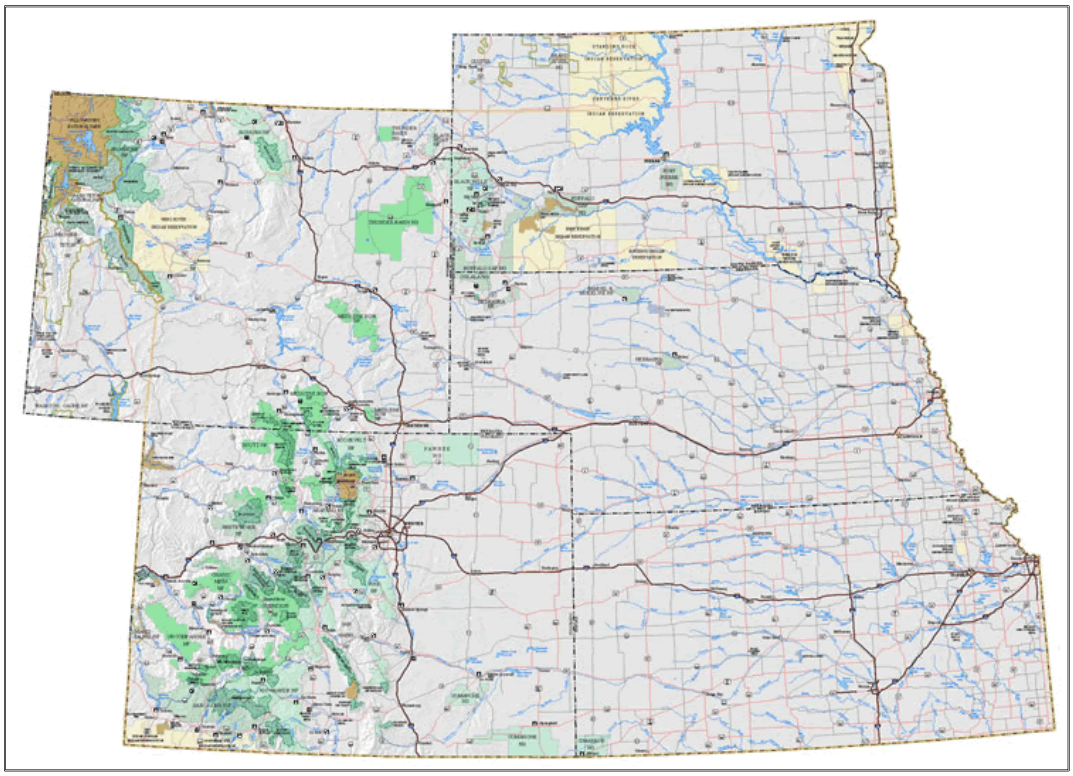

Figure 1. Map of the national forests and grasslands that make up the analysis area. The national forests and grasslands in Nebraska are not part of the analysis area.

Proposed Action

The proposed action uses an adaptive approach to manage caves and AMLs to respond to the dynamic nature of WNS introduction and spread. It has three tiers, each with required and optional management responses. Determining which tier and management apply depends on triggers related to the presence or absence of WNS and the magnitude of its impacts. The three tiers and their management responses are described in more detail in chapter 2.

- **Tier 1:** Neither WNS nor Gd has been confirmed within 250 miles of a ranger district, and caves would generally be open. However, caves serving as known hibernacula would have winter restrictions to protect bats during hibernation.
- **Tier 2:** Either WNS or Gd has been confirmed within 250 miles of a ranger district, and all caves would be closed unless identified as a targeted opening.
- **Tier 3:** WNS or Gd has been confirmed, but impacts to bat populations are either minimal or not detectable, or the disease is considered endemic. Caves would be open because access restrictions would presumably have no effect on the spread or containment of the disease in the analysis area.

Decision Framework

The responsible officials for this project are the forest supervisors for the forests and grasslands listed previously in the *Scope* section. Based on this analysis and information contained in the project record, the forest supervisors will decide whether to implement the proposed action, one of the other alternatives, or some combination of the alternatives. They will also decide if a forest plan amendment is necessary. An amendment may be necessary if the selected alternative conflicts with management direction in a unit's forest or grassland plan. The forest supervisor's decision will be documented and explained in a decision notice (DN) and finding of no significant impact (FONSI).

Public Involvement

The public involvement process determined the scope of the analysis and issues to be addressed (40 CFR 1501.7). A scoping letter was sent to more than 400 individuals, organizations, and state, federal, and local agencies. It described the purpose, need, and draft proposed action.

Tribal consultation took place throughout the process. Approximately 150 tribes and tribal affiliates were consulted and mailed or emailed as part of the tribal consultation process. Prior to the decision, we sent letters, further explaining the proposed action. We did not receive any comments from tribes, and no additional consultation was requested.

The combined 30-day notice and comment period generated approximately 5,960 comments, including about 5,740 form emails asking for access restrictions to protect bats. Approximately 160 additional email responses contained some unique input and were classified as "form plus" comments. We also received approximately 60 unique letters and emails representing bat conservation interests, individual cavers, and caving organizations. Bat conservation groups and some individuals were generally supportive of access restrictions. Recreational caving interests generally supported discontinuing the current blanket closure order in the Rocky Mountain region. Some comments expressed the need for compromise, with limited or seasonal access restrictions, decontamination protocols, and access for research.

Comments were also received from other federal, state, and local agencies. A few comments were received after the close of the 30-day comment period, and those were also considered.

Issues

Public comments and internal Forest Service input helped define the key issues used to develop alternatives and focus the analysis. Each comment letter was reviewed, and concerns were identified. The interdisciplinary team (IDT) reviewed the concerns and used them to define the key issues. Key issues helped the IDT refine the proposed action, develop alternatives, and identify resource conflicts. The IDT identified three key issues comprised of multiple sub-issues. These key issues were reviewed and approved by the responsible official from each national forest and the line officer representative. Additional information about comment analysis and a list of concerns and issues can be found in the project record.

Key Issue 1: Resource protection

Bat protection was a concern for many commenters. Commenters suggested that bats are important to biodiversity and insect management and deserve priority over human recreational activity. Commenters wanted WNS to be contained and they supported efforts to increase the scientific understanding of WNS and Gd and the relationship to human spread and bat populations. Commenters were also concerned that closing caves would eliminate access to important archeological and historical sites.

Indicator: Spread of WNS into the analysis area and impacts to bat populations and protection of other cave values.

Key Issue 2: Access to caves and abandoned mines

Access to caves and AMLs was a concern for commenters. Some commenters supported closures or restricted access; other indicated closures and restrictions are unnecessary. Commenters who supported restricting access asked the Forest Service to consider blanket closures, seasonal restrictions, targeted restrictions, decontamination requirements, prohibiting gear from states with WNS, and various triggers or thresholds for these activities. Other commenters raised concerns about the effectiveness of these restrictions, indicating that only law-abiding citizens and responsible cavers are being kept out of caves. Some commenters stated that restrictions are not necessary because WNS and Gd have not been detected in the analysis area.

Some commenters supported limited access for activities such as science/research and search and rescue. Some commenters supported access for individuals belonging to the National Speleological Society (NSS) and the Cave Research Foundation (CRF); others were concerned about allowing specific groups to have special access.

Commenters were concerned about the economic effect of closing caves, including impacts to the local economy and private enterprises, such as campgrounds that cater to cavers. Commenters were also concerned that limiting access would reduce educational opportunities.

Indicator: Impacts of access restrictions and requirements for entry.

Key Issue 3: Communication and coordination

Commenters were concerned about effective ways to engage the public, specific user groups, and research organizations such as Bat Conservation International. They were also concerned about coordinated engagement among state and federal land management agencies. Other commenters were concerned about consistent approaches to cave management within the U.S. Forest Service and the agency's ability to enforce closures and access restrictions.

Commenters identified public education as a tool to improve understanding of the importance of bats and cave resources and the impacts human disturbance can have on these resources.

Indicator: Utilize information from agencies and engage partners for educational materials, scientific information, and monitoring.

Dismissed Concerns

Many concerns were dismissed because they were not key issues. Dismissed concerns were typically outside the scope of the analysis; addressed by existing law, regulation, or agency decision; would likely have no, or negligible effect; or in some cases, lacked a cause-and-effect relationship to the activities proposed in the scoping letter. Dismissed concerns were often too general to help with alternative development or they were personal opinions or position statements that lacked context for this process. The rationale for dismissing concerns is in the project record and is available for public review.

Chapter 2: Alternatives Including the Proposed Action

Three alternatives were analyzed in detail: Alternative 1, the no action alternative; Alternative 2, the proposed action; and Alternative 3, the full closure alternative. The proposed action was developed in response to the purpose and need and key issues described in chapter 1. This chapter describes the proposed action and alternatives and compares them. This gives the responsible officials a range of management options to consider.

Table 1. Summary of key components of proposed action and alternatives**.**

Alternative	**Summary Description and Key Components**
Alternative 1 No action	Caves and abandoned mines are generally open for access as guided by forest plan direction.
Alternative 2 Proposed action	A three-tiered adaptive approach modifies management direction based on distance from confirmed presence of GD or confirmed cases of WNS and the magnitude of the impacts.
	Has optional management strategies to fit local conditions.
	Establishes a registration system for cave visitors.
Tier 1	Gd or WNS absent. Caves and mines are generally open with winter closures for known hibernacula. Prohibits use of clothing gear from states and Canadian provinces with WNS. Some exceptions to closures.
Tier 2	Gd or WNS present within 250 miles. Caves and mines are closed with options for some to be open. Some exceptions to the closures.
Tier 3	Gd or WNS present but impacts are minimal or disease is endemic. Management in tiers 1 and 2 does not apply; caves and abandoned mines are generally open per forest plan direction. Requires a re-examination of WNS science and discussion with federal and state wildlife agencies and the regional office.
Alternative 3 Full closure	Access to caves and abandoned mines is prohibited with limited exceptions.

Activities Common to all Alternatives

The following emphasis and management direction would apply under all the alternatives in addition to the alternative-specific direction described in the *Alternatives Considered in Detail* section.

Management of Abandoned Mine Lands (AMLs)

The Forest Service would continue to discourage the public from entering abandoned mines.

The Forest Service is an active proponent of the Stay Out–Stay Alive campaign which was launched in 1999 by the Mine Safety and Health Administration (MSHA). This is a collaborative effort among more than 70 agencies and organizations. The campaign warns outdoor enthusiasts of the dangers of exploring active and abandoned mine sites.

If the Forest Service hires contractors to decommission, close, and/or reclaim AMLs, the contractors would follow USFWS decontamination protocols where appropriate.

Existing Gates, Physical Closures, Closure Orders, Restrictions, and Management

Existing gates or other restrictions on caves and abandoned mines would remain in place.

The existing closure order would be replaced with the management direction described for the proposed action and the alternatives. The closure order expires on August 1, 2013.

The proposed action and alternatives would not preclude future restrictions for WNS, safety, or other considerations.

Coordination

The national forests in the analysis area will continue to coordinate with federal and state agencies and other partners as appropriate, regardless of the alternative selected. Examples include the development or modification of state response plans or providing input to other land managers.

Alternatives Considered in Detail

Alternative 1 (No Action)

Under the no action alternative, cave and AML management would revert back to forest plan direction when the current emergency closure order expires on August 1, 2013. In most cases, caves would be open for entry, and there would be no decontamination requirements or gear/clothing restrictions.

Alternative 2 (Proposed Action)

The proposed action uses an adaptive management strategy for caves and abandoned mines to limit potential introduction, spread, and impacts of WNS and Gd. This strategy recognizes the need for a consistent approach, while providing flexibility to accommodate unique circumstances and local conditions.

The proposed action includes three tiers of management response that are triggered by the presence or absence of WNS and the magnitude of its impacts. If there are no confirmed cases of WNS or Gd within 250 miles of a ranger district boundary, tier 1 management applies. The U.S. Fish and Wildlife Service (USFWS) typically declares official occurrences of WNS or Gd. They establish the 250-mile distance using the boundaries of the county in which WNS or Gd was found.

Tier 1: Caves Open with Targeted Closures

Neither WNS nor Gd occurs within 250 miles of a ranger district boundary.

Required Activities	Optional Activities
1. Prohibit caving gear and clothing used in states or Canadian provinces where WNS is confirmed or suspected.	1. Year-round closures for caves that are known hibernacula.
2. Visitor registration system for cave access.	2. Seasonal or year-round closures for swarming sites and maternity sites.
3. Seasonal closures for caves that are known hibernacula.	3. Decontamination procedures for all caves.
4. Year-round decontamination procedures for caves that are known hibernacula. This applies to the exceptions listed on page 9.	4. Decontamination procedures for abandoned mines, where appropriate.

Tier 2: Caves Closed with Targeted Openings

WNS or Gd has been confirmed within 250 miles of a ranger district boundary. Following the confirmation of Gd or WNS, the ranger district falls into tier 2, and implementation will occur as quickly as practicable. The responsible official may add other ranger districts or the entire national forest for management consistency.

Required Activities	Optional Activities
1. Year-round closures on all caves.	1. Targeted cave openings.
2. Decontamination before and after entry for exceptions to closures (listed on page 9).	2. Decontamination procedures for targeted openings.
	3. Decontamination procedures for AMLs, where appropriate.

Tier 3: Release from Management Activities under Tiers 1 and 2

In tier 3, the management activities in tiers 1 and 2 would no longer apply. Tier 3 would allow management for unexpected behavior of the disease or unanticipated impacts to bats. It addresses the scenario in which WNS or Gd has been confirmed, but impacts to bat populations are either minimal or undetectable or the disease is considered endemic in the analysis area. Moving to tier 3 requires a re-examination of WNS science and discussion with federal and state wildlife agencies and the regional office.

Description of Management Options Available in Tiers 1 and 2

Visitor registration is required in tier 1. The visitor registration system would be a free, web-accessible format that would ask for basic information and allow users to print registration confirmation to have with them when caving. The system would be used to share educational material and would have a place to provide feedback on the caving trip.

Seasonal closures are both required and optional in tier 1. The closures would generally be from October 15th through April 15th. These dates could vary depending on local information about when bats occupy and leave the site. Seasonal closures would be mandatory for known hibernacula and optional for swarming or maternity sites. The national forest would maintain a confidential, internal list of these sites and the list could be updated when new information became available.

Targeted openings are an optional activity in tier 2**.** Caves targeted for opening would typically not be used by bats or would not have the right conditions for Gd to thrive.

Decontamination protocols are optional in tier 1 and both required and optional in tier 2. The most current USFWS decontamination protocols would be used and they would be automatically updated when new or revised protocols are available. Decontamination protocols developed by the Forest Service could also be used, if appropriate. Current USFWS protocols are included in the project record and can also be found at the following link: http://www.whitenosesyndrome.org/sites/default/files/resource/national_wns_revise_final_6.25.12.pdf

Signs for cave closures would be placed at cave entrances. Cave closures are required or optional activities under tiers 1 and 2. Signs would be free-standing to avoid ground disturbance and would be inconspicuous to avoid drawing attention to the cave entrances. In some cases, signs at trailheads or secondary roads may be appropriate.

Public education materials about WNS would be available on the web and at national forest offices, campgrounds, kiosks, and other sites. Material would be kept current and would include access information depending on the tier.

Show caves should be addressed individually through permit conditions or other mechanisms, as appropriate. Some management activities described above may be appropriate for show caves, but they would be evaluated individually at the discretion of the forest supervisor.

Cave locations – All reasonable efforts would be made to avoid drawing attention to cave locations. For example, caves may be targeted as open in tier 2. Information about these open caves – cave names and locations – may be available if requested. Where appropriate, cave identification numbers would be used to identify caves in publically available information.

Exceptions to closures: The following exceptions would apply in tiers 1 and 2:

1. Any federal, state, or local law enforcement officer or member of an organized rescue or firefighting force working in the performance of an official duty.
2. Persons operating under the 1872 Mining Law.
3. Tribal members wishing to conduct ceremonies, rituals, or other culturally important events.
4. Forest Service employees, contractors, and volunteers; personnel from state or federal wildlife agencies; or other permitted persons conducting official business, as authorized by the forest supervisor.
5. Persons conducting research, inventory, or monitoring as needed to understand or manage WNS and contribute to the nomination of cave resources as significant under the FCRPA (16 U.S.C. 4301 – 4309 and 36 C.F.R.290), as authorized by the forest supervisor.
6. Members of the NSS or CRF conducting activities consistent with the national memoranda of understanding (MOU) between the Forest Service and these caving organizations, as authorized by the forest supervisor.

Alternative 3 (Full Closure)

Access to caves and abandoned mines would be prohibited with limited exceptions (see below). Access restrictions under the current emergency closure order would be selected.

Prohibitions (2 and 3 apply to the exceptions listed below)

1. Entering any cave or abandoned mine, regardless of distance or depth.
2. Entering any cave or abandoned mine on NFS lands without decontaminating equipment prior to entry to, and departure from, said cave or abandoned mine.
3. Use of any clothing or equipment that has been used in caves or mines in WNS affected states and Canadian provinces in any cave or abandoned mine on NFS lands.

Exceptions

1. Any federal, state, or local law enforcement officer or member of an organized rescue or firefighting force working in the performance of an official duty.
2. Persons operating under the 1872 Mining Law.
3. When conducting WNS-related activities, Forest Service employees, contractors to the Forest Service, and personnel from state wildlife agencies.

Exceptions under alternative 3, cont.

4. Persons with a written authorization from a forest supervisor specifically authorizing cave entry to conduct research, inventory, or monitoring as needed to understand and manage WNS and contribute to the nomination of cave resources as significant under the FCRPA (16 U.S.C. 4301 – 4309 and 36 C.F.R.290) with such written authorization in the physical possession of the person or persons when undertaking the exempted activity.
5. Members of the NSS or CRF conducting activities consistent with the national MOU between the Forest Service and these caving organizations. Entry is prohibited from October 15th – April 15th to avoid disturbance to bats during winter hibernation season, unless otherwise authorized by the forest supervisor.

Comparison of Alternatives

The following table summarizes the effects of each alternative on key issues identified in chapter 1 and resources discussed in chapter 3 and in specialist reports (available in the project record).

Table 2. Summary of effects to key issues and resources from the alternatives.

	Alternative 1 – No Action	**Alternative 2 – Proposed Action**	**Alternative 3 – Full Closure**
Issue 1. Resource Protection: Spread of WNS, impacts to bats, other cave values			
Likely to result in a loss of viability in the planning area, or in a trend toward federal listing.	Townsends' big-eared bat, fringed myotis		
May adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.	Spotted bat	Townsends' big-eared bat, fringed myotis, spotted bat	
No impact.	Hoary bat	Hoary bat	Townsends' big-eared bat, fringed myotis, spotted bat, hoary bat
There are four sensitive bat species in the analysis area. There are no endangered, threatened, proposed, or candidate bat species.			

	Alternative 1 – No Action	**Alternative 2 – Proposed Action**	**Alternative 3 – Full Closure**
Little brown myotis, big brown bat, northern long-eared bat, tri-colored bat	Unrestricted access to caves would increase the risk of humans introducing Gd and potentially WNS into caves used by these bats.	Tier 1 required activities would reduce the risk of human-introduced Gd and reduce disturbance to hibernating bats compared to alternative 1. Optional activities would further reduce the potential threat of human introduction of Gd or WNS. Tier 2 would close caves and provide additional protection for bats when compared to tier 1. Tier 3 has the same effects as alternative 1.	This alternative would be the most favorable for reducing the risk of humans introducing Gd and potentially WNS into the Rocky Mountain region.
Archeological, cultural concerns	Not likely to impact.	Not likely to impact.	Not likely to impact.
	Caves open for research, preservation, and tribal activities.	Exceptions for tribal activities, volunteers, and permitted persons.	
		Closure signs would be free-standing and would not disturb culturally sensitive sites.	
Issue 2. Access: Impacts of access restrictions and requirements for entry, associated economic impacts			
Access for cavers	Caves would generally be open, based on existing forest plan direction.	Tier 1 – seasonal access restrictions for some caves. Optional management could further restrict access. Limited exceptions to closures	Access to caves is prohibited with limited exceptions.
		Tier 2 – access prohibited year-round. Optional management could open some caves. Limited exceptions to closures	

	Alternative 1 – No Action	**Alternative 2 – Proposed Action**	**Alternative 3 – Full Closure**
Access for cavers, cont.		Tier 3 – caves generally open, depending on forest plan direction.	
Requirements for entry	None	Tier 1 requires registration and has clothing and gear prohibitions. Optional management may require decontamination.	NA – Entry prohibited.
Associated economic activity	Highest potential economic activity from increased access to caving opportunities. This depends on forest plan direction for cave management.	Tier 1 – less potential economic activity than alternative 1 due to required seasonal closures. Tier 2 – economic activity similar to alternative 3. Tier 3 – economic activity similar to alternative 1.	Least potential economic activity due to full closures.
Issue 3. Coordination and Communication: Within agency, other agencies and departments, partners, science, and monitoring			
Coordinated engagement with the public and other agencies	May vary from state to state	High level of regional coordination. Tier 3 requires coordination with partners and the regional office.	Does not promote coordination with other agencies. Full closure limits opportunities to engage caving and research organizations to help monitor and protect caves.
Consistent Forest Service response to Gd and WNS	Responses may vary based on forest plan direction for cave management	Base level of consistency among national forests in Colorado, Wyoming, South Dakota and Kansas.	Consistent response (full closure) among national forests in Colorado, Wyoming, South Dakota, and Kansas.
	Responses may vary from state to state, depending on coordination with state agencies.	Consistent use of USFWS information and protocols.	

Chapter 3: Environmental Effects of the Alternatives

The environmental effects of the proposed action and alternatives 1 and 3 are described below. The analysis focuses on those resources most likely to be affected by these alternatives. The effects analysis uses the following assumptions:

- Administrative closures are effective, and Stay Out–Stay Alive practices are followed for AMLs.
- Decontamination procedures and gear restrictions are implemented and are effective.
- Where there is no scientific consensus on effects, the analysis assumes negative impacts to bats.
- Bats are the only wildlife species affected by WNS.
- Bat species that hibernate are more susceptible to WNS than other bat species.
- Impacts to bats in the analysis area will be similar to impacts observed in eastern North America.
- Humans can spread Gd.
- Cave and abandoned mine conditions are suitable for growth and persistence of Gd.

The spatial boundary for the effects analysis is the national forest system (NFS) lands on the ten administrative units listed on page 1 and shown in figure 1. Management activities on adjacent private and public lands were considered in the cumulative effects analysis.

Recreational and Research Caving

Recreational caving on NFS lands in the analysis area is a relatively popular activity. Caving is often undertaken for the enjoyment of the outdoor activity or for physical exercise, as well as original discovery and exploration, similar to mountaineering or diving. Physical or biological science is also an important goal for some cavers. The analysis area contains hundreds of caves that provide various caving opportunities ranging from commercially guided trips into caves with easy access to remote wild caving opportunities with difficult access.

The caving community consists of independent cavers and cavers who are affiliated with, or belong to, a larger organization. Some cavers are members of the NSS and/or the CRF; both provide valuable educational, research, monitoring, and other benefits to cave resource management. The U.S. Forest Service maintains national MOUs with these organizations. The Forest Service also recognizes the role of the Colorado Cave Survey (CSS), which often serves as a liaison to the caving community in Colorado. Access restrictions affect these organized groups, as well as independent cavers.

Effects to Recreational and Research Caving from Alternative 1

Under this alternative, the current cave closure order would expire and caves would generally be open, based on forest plan direction. Commercial and noncommercial recreational access to caves could increase along with any revenue to local economies associated with more cave visits.

National forests or ranger districts may wish to close caves for safety or resource concerns separate from this analysis. Existing and future forest plan direction or site-specific decisions about cave or AML access would not be precluded under this alternative.

Effects to Recreational and Research Caving from Alternative 2:

This alternative emphasizes a three-tiered adaptive approach that includes required and optional management strategies for cave and AML management.

Tier 1: Some cavers would be moderately impacted because caving gear used in an area with WNS or Gd would be prohibited in the analysis area. However, some cavers already practice this. Caves serving as known hibernacula would be closed seasonally, from October 15 – April 15 to protect hibernating bats. Impacts from the closures are somewhat mitigated because caves would be closed during a slower season for recreational caving.

Tier 1 also has optional strategies, such as mandatory decontamination for all caves or additional access restrictions. Mandatory decontamination would moderately impact some cavers; however some cavers already use decontamination protocols.

Tier 2 results in considerably fewer caving opportunities compared to tier 1 or alternative 1. Economic interests tied to caving, such as local campgrounds and other businesses, would likely see reduced revenues associated with these restrictions.

Tier 3: Impacts to cavers under tier 3 are the same as those described for alternative 1.

Effects to Recreational and Research Caving from Alternative 3:

Under this alternative, all caves would be closed with limited exceptions. Effects of this alternative to recreational caving and related business would be similar to effects experienced under the current closure order.

This alternative would result in more negative impacts to recreational caving than the proposed action or alternative 1. Caving-related businesses would have reduced revenue. During the public comment period, cavers and affiliated caving groups described being excluded from caves on Forest Service lands within the Rocky Mountain region. Campground owners and other parties that derive some of their income from recreational cavers described negative impacts to their businesses.

Cumulative Effects of the Alternatives on Recreational and Research Caving

Caving access on adjacent lands outside the analysis area boundaries was the past, present, and reasonably foreseeable future action considered in this cumulative effects analysis for recreational and research caving.

Under alternative 1, commercial and noncommercial recreational caving opportunities would likely increase with possible increases in revenue to local economies associated with more cave visits. When combined with access to caves on non-FS land, the result is a possible shift in use from caves

on adjacent lands to caves on NFS land in the analysis area. Overall, revenue is not expected to change because this is a shift in use not an increase or decrease in cumulative cave visits.

Alternative 2, tier 1 could have moderate impacts on cavers due to clothing/gear restrictions and registration requirements. There could be additional effects if optional decontamination is implemented. The effects of tier 1, when combined with access to caves on non-FS, could be a shift in use, with decreased use in the analysis area as cavers choose less restrictive caves on adjacent lands. Because this is a shift in use, revenue is not expected to change.

Alternative 2, tier 2 would result in fewer caving opportunities and a potential decrease in revenue to cave-related businesses. Recreational caving use could shift to caves on adjacent land as available opportunities in the analysis area are reduced.

The cumulative effects of alternative 2, tier 3 would be the same as those for alternative 1.

Under Alternative 3, there would be no recreational caving opportunities and cave-related businesses would lose revenue. When combined with access to caves on adjacent land, there could be a shift in caving off NFS lands for the duration of the closure. Cave-related businesses could still derive revenue from caving activities on non-NFS land as long as those caves remain open.

Future cave closures on federal lands would result in a cumulative reduction of recreational caving opportunities. If cave closures increase, the analysis area may not be able to provide the caving community and other stakeholders with the access and opportunities they desire.

Bats and WNS

WNS is a disease that has resulted in large-scale population declines of several North American bats. It is caused by *Geomyces destructans* (Gd), a fungus that grows in cool, moist environments which are common in caves and abandoned mines. The pathogen affects bats when they are hibernating and have a lower body temperature. The mechanism of mortality is uncertain, though it may be related to the bats coming out of hibernation more often than usual (brief periods of activity to drink, urinate, groom, etc.) and the energy they expend during those times. It is estimated that WNS has killed nearly 6 million bats in the eastern U.S. and eastern Canada; mortality rates at affected sites can exceed 90%.

Of the twenty-two species of bats in the Rocky Mountain region, over a dozen use caves and abandoned mines as hibernation roost sites. The following Region 2 sensitive species were considered in the analysis: Townsend's big-eared bat, fringed myotis, spotted bat, and hoary bat. In addition, Region 2 has four bat species known to be affected by WNS: little brown myotis; big brown bat; northern long-eared bat; and tri-colored bat. Other bat species in the region (primarily those of the genus *Myotis*) also hibernate in caves and abandoned mines. These unaffected bats could also be susceptible to WNS or could transport Gd. Table3 lists the number of caves in the analysis area known to be used as hibernacula, maternity roosts, or swarming sites as of March 2013.

While the risk and probability of human-caused spread of Gd is debated by some, the fungus can be transmitted on clothing and equipment and can be cultured from very little soil. This means humans can move Gd from cave to cave on their gear, boots, and clothing, and once established, Gd spores can persist in caves and abandoned mines.

Table 3. Caves used as hibernacula, maternity roosts, or swarming sites in the analysis area.

Unit	Hibernacula	Maternity	Swarming	Total Known
Black Hills	18	2	0	19
White River	6	7	7	12
Bighorn	4	0	0	4
Shoshone	2	0	0	2
Arapaho Roosevelt Pawnee	0	0	0	0
Grand Mesa Uncompahgre Gunnison	0	0	0	0
Medicine Bow Routt Thunder Basin	0	0	0	0
Pike San Isabel Cimarron Comanche	0	0	0	0
Rio Grande	0	0	0	0
San Juan	0	0	0	0

Effects to Bats from Alternative 1

Alternative 1 would allow the public to enter almost all caves in the analysis area. While some forests may have cave closure orders at known important bat sites, these situations are currently the exception.

Allowing the public unrestricted access to caves, especially caves which are known bat hibernacula, would increase the risk of humans introducing Gd and potentially WNS into Region 2. The risk increases as the list of confirmed WNS sites continues to expand.

Under alternative 1, the determination for Townsend's big-eared bat and fringed myotis is *likely to result in a loss of viability in the planning area, or in a trend toward federal listing.*

The determination for the spotted bat is *may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.*

The determination for the hoary bat is *no impact*.

Effects to Bats from Alternative 2

The proposed action provides an adaptive management strategy for caves and abandoned mines to limit potential introduction and spread of Gd and WNS while also providing recreational caving opportunities.

Tier 1: The required activities in tier 1 reduce the threat of human-introduced Gd and reduce disturbance to hibernating bats when compared to alternative 1. Prohibiting caving gear and clothing used in states and Canadian provinces with WNS is expected to reduce the risk of Gd being introduced in to caves and mines in the analysis area. Seasonal closures would reduce disturbance to hibernating bats. Requiring decontamination procedures only in known hibernacula does not prevent Gd and WNS from being transported from caves that do not require decontamination.

Optional activities allow more extensive measures to protect bats and reduce the potential threat of human introduction of Gd or WNS. Year-round closures for known hibernacula, maternity sites, and swarming sites are expected to further reduce disturbance to bats and reduce the risk of WNS slightly by reducing the areas accessible by humans. The option of decontamination for all caves and mines offers the least risk that Gd would be introduced by humans, especially when combined with the required prohibition against caving gear and clothing used in WNS states and Canadian provinces.

Tier 1 establishes a visitor registration system. The system is designed to educate the public about WNS and the ecological and economic loss of millions of bats. These efforts may help get the caving public to voluntarily follow seasonal use restrictions and decontamination protocols and to help educate their peers.

Tier 2 would close caves and provide additional protection for bats when compared to tier 1. Year-round closures on all caves are expected to further reduce disturbance to bats and reduce the risk of WNS slightly by reducing the areas accessible by humans. The option of allowing targeted openings is not expected to increase the risk of WNS. For caves where access is allowed, decontamination procedures would decrease the risk of spreading Gd. The option of using decontamination procedures for abandoned mines is also expected to reduce the risk of WNS slightly.

Tier 3: The effects are the same as those described for alternative 1.

Under alternative 2, the determination for Townsend's big-eared bat, fringed myotis and spotted bat is *may adversely impact individuals, but not likely to result in a loss of viability in the planning area, nor cause a trend toward federal listing.* The determination for the hoary bat is *no impact*.

Effects to Bats from Alternative 3

Alternative 3 would close all caves with limited exceptions. The effects of this alternative would be similar to the effects under the current closure order.

This alternative would be the most favorable for reducing the risk of humans introducing Gd and potentially WNS into the Rocky Mountain region. This alternative would limit entry of ethical cavers who could help protect the caves and bats by imparting their values to other cavers and reporting abuse of caves to officials.

Under alternative 3, the determination for Townsend's big-eared bat, fringed myotis, spotted bat and hoary bat is *no impact*.

Cumulative Effects of the Alternatives on Bats

Hoary bats are not affected by the proposed action or alternatives so there are no cumulative effects to this species.

Many actions by agencies and people could impact individual Townsend's big-eared bats, spotted bats, fringed myotis, other bat species, and the environment they depend on. For example, vegetation management projects and demolition/renovation of old building can remove summer roost sites, wind energy turbines can cause direct mortality, water impoundments can increase water availability for bats. For this programmatic analysis, it is not practical to detail all potential effects that could result from actions taking place in and around the analysis area over time.

However, the most important potential cumulative effect is the introduction of Gd into cave or AML habitats on non-NFS lands. If Gd is introduced to cave or AML habitats anywhere in the five states in Region 2, it will likely spread rapidly via bat-to-bat transmission and could quickly contaminate cave and AML habitat on NFS lands. Should this occur, our ability to minimize WNS impacts would be greatly reduced.

In alternative 1, allowing the public unrestricted access to caves, especially caves which are known bat hibernacula, would increase the risk of humans introducing Gd and potentially WNS into Region 2. When combined with effects of Gd introduction on non-NFS lands, this alternative would have the greatest potential for adverse cumulative effects to bats in the analysis area.

In alternative 2, tier 1, prohibiting potentially contaminated caving gear and clothing and requiring decontamination protocols for some caves are expected to reduce the risk of Gd being introduced in to caves and mines in the analysis area. Seasonal closures would reduce disturbance to hibernating bats. The positive impacts of these protection measures would be reduced if Gd was introduced into cave or AML habitats on non-NFS lands.

In alternative 2, tier 2, year-round cave closures are expected to reduce disturbance to bats and reduce the risk of WNS slightly. As with tier 1, the positive impacts of these protection measures would be reduced if Gd was introduced into cave or AML habitats on non-NFS lands.

The cumulative effects of alternative 2, tier 3, are the same as those described for alternative 1.

Alternative 3 would be the most favorable for reducing the risk of human transmission of Gd and reducing the spread of WNS. However, if Gd was introduced into cave or AML habitats on non-NFS lands and WNS was transmitted from bat to bat into NFS caves and mines, closures under this alternative would not prevent bat mortality.

Compliance with Other Laws and Regulations

National Forest Management Act – If the proposed action or chosen alternative is inconsistent with a forest or grassland plan, the plan will be amended appropriately.

Endangered Species Act – The U.S. Fish and Wildlife Service identifies federally listed proposed, threatened, and endangered species. These species were reviewed and it was determined that habitat for these species does not exist at any of the cave or AML locations. Therefore, a determination of no effect on any federally listed species was made and no further consultation with U.S. Fish and Wildlife Service is required. The analysis and determination are documented in the biological evaluation and assessment which is located in the project record and available upon request.

Executive Order 12898, Environmental Justice -Concern for environmental justice stems from Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," signed February 11, 1994 by President Clinton.

> *"each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States."*

The population in the analysis area was reviewed and while there are some minority and low-income populations present, it is unlikely that any alternative would have disproportionately high adverse impacts. If future actions to specific sites are needed in areas with minority or low-income populations, additional outreach should be conducted to unsure no disproportionate impact might occur to those populations.

Federal Cave Resource Protection Act of 1988 – The proposed action and alternatives are consistent with the act. Specific locations of significant caves are not being made available to the public. The EA lists the number of caves which are bat hibernacula or maternity and swarming sites but does not divulge cave locations.

National Historic Preservation Act of 1966 – Section 106 of the National Historic Preservation Act requires all federal undertakings to follow regulations (36 CFR 800) to identify and protect cultural resources in the project areas and which may be affected by projects. The proposed action does not include ground-disturbing activities and does not restrict access for research, preservation, or tribal activities. A finding of *no potential to cause effect* has been reached by the Forest Service and is documented in the project record.

Chapter 4: Consultation and Coordination

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