

Ely District Cave Management Plan and Environmental Assessment



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PART 1: CAVE MANAGEMENT PLAN

CHAPTER 1: INTRODUCTION & BACKGROUND

1.1 PURPOSE AND NEED

Caves are an invaluable and irreplaceable part of the Nation's natural heritage. Biological, cultural, scientific, educational, and recreational resources are all affected by management of caves. Cave resource management is necessary to ensure long-term protection and conservation of these fragile resources while accommodating uses such as scientific research and discovery as well as quality recreational caving experiences.

The purpose of the Bureau of Land Management (BLM), Ely District Office (EYDO) Cave Management Plan (Plan) is to provide guidance for cave management and provide for recreation within caves across the Ely District (District) (refer to Map 1), while ensuring protection of cave resources. This Plan will establish direction for long-term management, planning, and oversight of the cave resources and identify specific management actions for recreational use, scientific research, and management of cave resources. A cave management plan is needed to establish district policy for multiple-use management practices regarding caves and cave-related resources.

This Plan will provide a framework for cave resource management to preserve the delicate balance between natural, undisturbed ecosystems within caves, recreational caving, scientific research, and surface uses above caves. This Plan will also establish guidance for consistency in cave protection, recreational use, internal cave file development and management, while identifying priorities and emergency action protocols inherent in managing cave resources.

1.2 CONFORMANCE

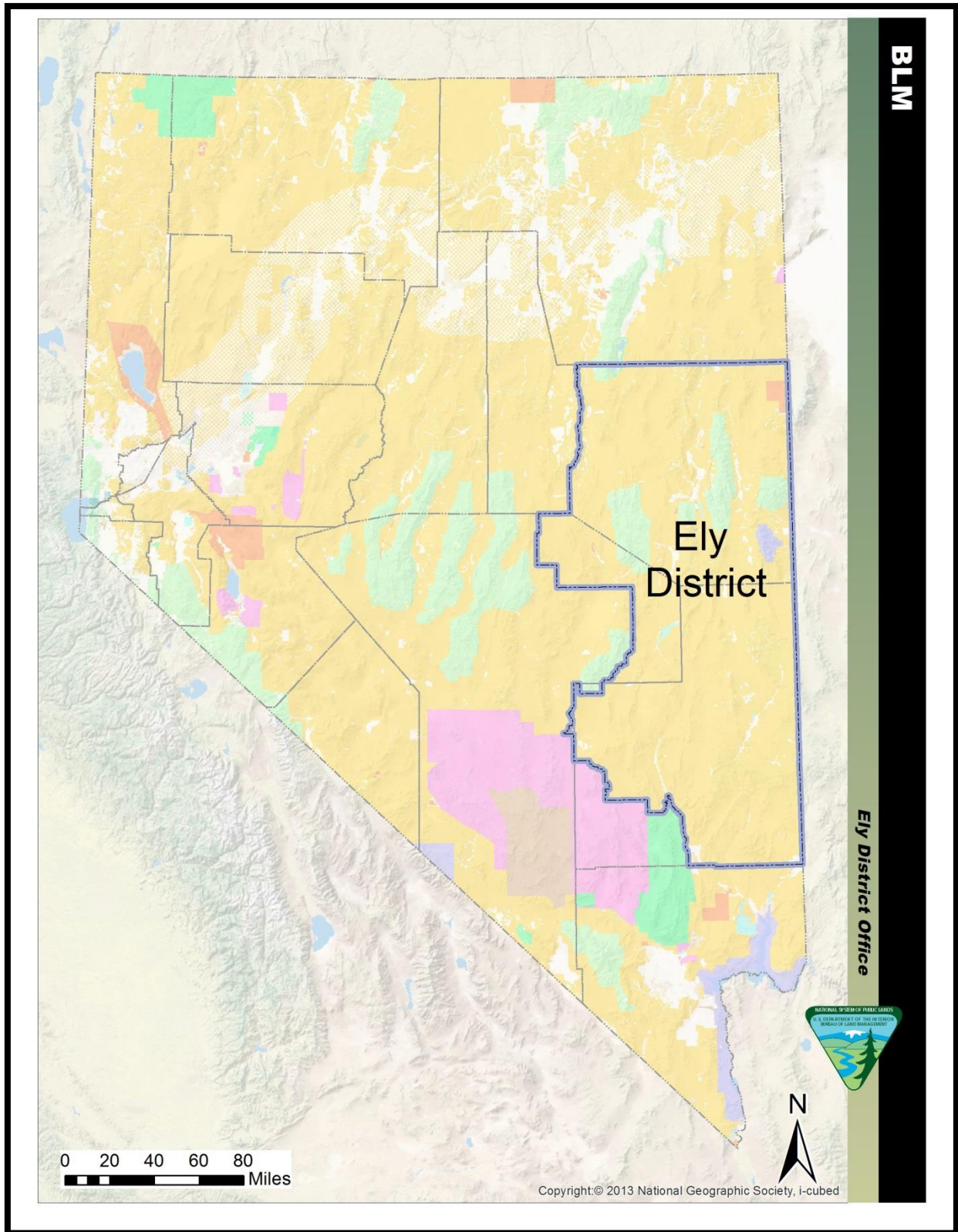
1.2.1 Federal Cave Resources Protection Act of 1988

The BLM is directed by the Congress to manage Federal lands "in a manner which protects and maintains, to the extent practical, significant caves." (Federal Caves Resource Protection Act (FCRPA), 1988, Section 2 (c)). The FCRPA was the first federal legislation to recognize caves and their contents as whole integrated ecosystems. The FCRPA and the Department of Interior implementing regulations, 43 Code of Federal Regulations (CFR) Part 37, are included as appendices.

The FCRPA declares that:

- 1) significant caves on Federal lands are an invaluable and irreplaceable part of the Nation's natural heritage; and
- 2) in some instances, these significant caves are threatened due to improper use, increased recreational demand, urban spread, and a lack of specific statutory protection (Section 2 (a)).

MAP 1- ELY DISTRICT



The purposes of the Act are:

- 1) to secure, protect and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people; and
- 2) to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, education, or recreational purposes (Section 2 (b)).

The Department of Interior implementation regulations, 43 CFR Part 37.2, for the FCRPA states:

“It is the policy of the Secretary that Federal lands be managed in a manner which, to the extent practical, protects and maintains significant caves and cave resources.”

1.2.2 Conformance with Existing Laws and Regulations:

The following laws, manuals, and handbooks direct Federal agencies to secure, protect, and preserve significant caves and the resources contained therein, while managing them for the perpetual use, enjoyment, and benefit of all for generations to come.

- Antiquities Act of 1906, Public Law (P.L.) 59-209 34 Stat. 225 (16 United States Code (U.S.C.) §§ 431- 433).
- Wilderness Act of 1964, P.L. 88-577 (16 U.S. C. §§ 1131-1136, September 3, 1964, as amended 1978).
- Title 54 U.S.C. §300101, et. seq., commonly known as the National Historic Preservation Act of 1966, as amended (NHPA).
- National Environmental Policy Act of 1969, P.L. 91-190 (42 U.S.C. §§ 4321-4347, January 1, 1970, as amended 1975 and 1994).
- Endangered Species Act of 1973, PL 59-209 (16 U.S.C. §§ 1531-1544, December 28, 1973, as amended 1976-1982, 1984, and 1988).
- Federal Land Policy and Management Act of 1976, as amended, P.L.94-579 (43 U.S.C. §§ 1701-1782, October 21, 1976, as amended 1978, 1984, 1986, 1990-1992, 1994, and 1996).
- Clean Water Act of 1977 (33 U.S.C §§ 1251-1376).
- Archaeological Resources Protection Act of 1979, P.L. 96-95 (16 U.S.C. 470aa-mm).
- Federal Cave Resources Protection Act of 1988, P.L. 100-691 (16 U.S.C. § 4301, as amended through P.L. 106-170, 1999).
- Native American Graves Protection and Repatriation Act of 1990, P.L. 101-601 (25 U.S.C. §§ 3001-3013).
- Cave and Karst Research Institute Act of 1998, P. L. 105-325 (16 U.S.C. § 4310).
- The Lincoln County Conservation, Recreation and Development Act of 2004, P.L. 108-424.

- The White Pine County Conservation, Recreation and Development Act of 2006, P.L. 109-432.
- Omnibus Public Land Management Act of 2009, Subtitle D, Paleontological Resources Preservation Act.
- 43 CFR Part 37—Cave Resources Management
- 43 CFR Part 6300—Management of Designated Wilderness
- 43 CFR 1610.7-2—Designation of Areas of Critical Environmental Concern
- BLM-MOU-WO-250-2007-01—Memorandum of Understanding between the Bureau of Land Management, the National Speleological Society, and the Cave Research Foundation
- BLM-WO-IM-2010-181 which includes BLM-White-Nose Syndrome Interim Response Strategy and BLM Containment and Decontamination Procedures

1.2.3 Conformance with Existing BLM Land Use Plans:

This Plan has been analyzed within the scope of the Ely District Approved Resource Management Plan (RMP) (2008) and has been found to be in conformance with the goals, objectives, and decisions of the Record of Decision. Specific management actions from the RMP provide direction to meet the goals and objectives of cave resource management:

1. *Recreation: REC-1:* Manage for the protection of cave resources in the planning area according to the Ely District Office Cave Management Plan (1986).
2. *Livestock Grazing: LG-2:* The following public lands are unavailable for livestock grazing (see Map 19): Snake Creek Indian Burial Cave Area of Critical Environmental Concern (ACEC) (40 acres); SS-7
3. *Special Designations: SD-8:* Designate the following 7 areas as ACECs (see Management Actions SD-3) – two of which are Archaeological Sites- Rose Guano Bat Cave and Snake Creek Indian Burial Cave.

1.2.4 Consistency with BLM Policy Manuals and Handbooks:

- BLM Manual 8380—Cave and Karst Resources Management
- BLM Manual 1613—Areas of Critical Environmental Concern
- BLM Manual 6330—Management of Wilderness Study Areas
- BLM Manual 6340— Management of Designated Wilderness Areas
- BLM Manual 6840—Special Status Species Management
- BLM H-1601-1—Land Use Planning Handbook
- BLM Manual Handbook 1112-1—Safety and Health Management

1.3 DEFINITIONS

The following definitions are provided by the FCRPA, 1988 (see Appendix 1), and from 43 CFR, Part 37 (see Appendix 2), and will be used by the EYDO in this Plan.

From FCRPA, Section 3:

CAVE - Any naturally occurring void, cavity, recess, or system of interconnected passages beneath the surface of the earth or within a cliff or ledge, including any cave resource therein, and which is large enough to permit a person to enter, whether the entrance is excavated or naturally formed. Such term shall include any natural pit, sinkhole, or other feature that is an extension of a cave entrance or which is an integral part of the cave.

CAVE RESOURCE - Any materials or substances occurring in caves on Federal lands, including, but not limited to, biotic, cultural, mineralogic, paleontologic, geologic, and hydrologic resources.

SPELEOTHEM - Any natural mineral formation or deposit occurring in a cave, including, but not limited to any stalactite, stalagmite, helictite, cave flower, flowstone, concretion, drapery, rimstone, or formation of clay or mud.

From 43 CFR, Part 37.11(c):

SIGNIFICANT CAVE - A cave located on Federal lands that has been determined to possess one or more of the following features, characteristics, or values:

(1) Biota. The cave provides seasonal or year-long habitat for organisms or animals, or contains species or subspecies of flora or fauna that are native to caves, or are sensitive to disturbance, or are found on State or Federal sensitive, threatened, or endangered species lists.

(2) Cultural. The cave contains historic properties or archaeological resources (as described in Title 54 U.S.C. §300101, et. seq., commonly known as the National Historic Preservation Act of 1966, as amended (NHPA), and Title 54 U.S.C. §306108, commonly known as Section 106 of the NHPA (Section 106)) or other features that are included in or eligible for inclusion in the National Register of Historic Places because of their research importance for history or prehistory, historical associations, or other historical or traditional significance.

(3) Geologic/Mineralogic/Paleontologic. The cave possesses one or more of the following features:

- (i) Geologic or mineralogic features that are fragile, or that exhibit interesting formation processes, or that are otherwise useful for study.
- (ii) Deposits of sediments or features useful for evaluating past events.
- (iii) Paleontologic resources with potential to contribute useful educational and scientific information.

(4) Hydrologic. The cave is a part of a hydrologic system or contains water that is important to humans, biota, or development of cave resources.

(5) Recreational. The cave provides or could provide recreational opportunities or scenic values.

(6) Educational or Scientific. The cave offers opportunities for educational or scientific use; or, the cave is virtually in a pristine state, lacking evidence of contemporary human disturbance or impact; or, the length, volume, total depth, pit depth, height, or similar measurements are notable.

1.4 LOCATION AND SETTING

The District is located in east-central Nevada in the Basin and Range Province, better known as the Great Basin (refer to Map 1). The 11.4 million acres of public land in the District are arranged in a series of north-south trending mountain ranges separated by broad, high valleys. The ecosystems vary with elevation. In the valleys, rainfall averages 8 inches annually, vegetation consists almost entirely of low-lying shrubs, forbs and grasses. In the mountains, precipitation can be two or three times that of the valley floor and vegetation often includes heavy forest cover. Pinyon and juniper forests gradually give way to aspen and fir stands at the higher elevations.

The land within the District is sparsely populated and minimally developed. Development generally consists of ranching and mining activities. Ranching generally affects valleys and lower elevation portions of mountains. Mineral and energy exploration is increasing or may increase in the District and both valleys and mountains are affected by this activity.

1.5 FORMATION OF CAVES

There are a number of natural processes that form caves. Wind or water erodes rocks such as sandstone and produce shallow caves. Caves can also be sculpted out of ice. Furthermore, volcanic action produces caves, known as lava tubes. These tubes are formed when flowing molten lava begins to cool and forms a crust on the surface, while the lava inside continues to flow leaving a hollow tube. The process which forms the decorated limestone caves is more complex and will be described in greater detail, since most of the caves on the District are limestone.

1.5.1 Origin and Development of Limestone Caves

Cave bearing strata was originally deposited as limey ooze composed of microscopic shells from organisms which lived in the seas and extracted calcium carbonate from the water to build their shells. Most of the limestone and dolomite of interest were deposited in the great trough that extended from the Arctic Ocean south to the Gulf of California and covered most of Nevada, western Utah, and surrounding states. This deposition took place over a period of nearly 400 million years and resulted in thousands of feet of sediment layers.

Over millennia, limestone was formed by older layers of sediment being compressed by the weight of the younger layers. In many places, pressures were prolonged and in others, igneous intrusions caused a build-up of both heat and pressure; in some areas limestone metamorphosed into marble. These earth moving processes also resulted in numerous fractures in the bedding, which later played an important role in the development of caves.

The older sedimentary layers, those of Cambrian period, remained buried deep beneath the surface for millions of years. It was not until the end of the Cretaceous period (about 70 million years ago) that the geologic forces began to change. These changes caused the trough to be uplifted, folded, and buckled. Where layers fractured, geologic forces shoved adjacent segments on top of one another, exposing the jagged edges. The broken ends of tilted layers began sticking out of the sea. As the process continued, the sea began to drain back to the ocean leaving the muddy sea bottom exposed to the surface erosional forces. The broken layers continued to be uplifted and the emerging mountains gradually rose until their summits reached thousands of feet above sea level. Many of these forces are still acting on the landscape today.

Another major change began around 17 million years ago. In this case, the earth's crust in this area became wrinkled and hundreds of north-south ridges were formed across the Great Basin. Large sections were uplifted and others depressed to form the horst and graben landscape, characteristic of Nevada.

While the geologic forces were acting on the newly formed mountain ranges, climatic forces also had their effects. Cold weather (alternate freezing and thawing) caused the splitting and eventual erosion of the exposed surfaces. Water played an important role as well and seeped into the cracks and collected in the limestone layers along the cracks and fractures.

The water picked up carbon dioxide from the air and vegetative matter on the surface and this weak carbonic acid began to dissolve the limestone. It enlarged the cracks and where it pooled at the water table, it dissolved more rock. This downward flow and pooling of water resulted in the formation of water filled passages beneath the surface. As the process continued, the water dissolved deeper into the bedrock.

Climatic changes on the surface also changed the parameters underground. Alternate periods of wet and dry caused underground water levels to fluctuate. Erosional forces on the surface also acted on the exposed layers and caused enlarging of the water passageways.

Each sedimentary layer was affected locally. Some were exposed to glacial action while others collapsed. Regardless of the result, cave formation was taking place. Anywhere that limestone occurs has been dissolved to some extent. Much of this subterranean world is inaccessible to us since we can only enter where passageways extend to the surface through open fractures, collapses, sinkholes, or occasionally by man-made entrances that result from blasting and mining operations.

Speleothem development generally takes place during the periods when the passages are not completely filled with water. Due to the varied origin of formations, the EYDO will not cover them in this Plan.

1.6 CAVE RESOURCES ON THE DISTRICT

People are attracted to caves for many reasons, including recreational exploration or scientific study. Many of the caves on the District contain significant caves resources, as described in 43 CFR, Part 37. Significant cave resources include geological, biological, cultural, hydrological, education, scientific, and recreational values. Caves also provide a protected environment (consistent temperature and relative humidity) that preserves evidence of prehistoric humans, animals, and climate change.

Cave resources can be easily and irreversibly impacted by human visitation and surface impacts. Activities such as dumping garbage or hazardous waste in sink holes or cave entrances, drilling, mining, groundwater withdrawal, and road building may alter subterranean habitat. Cave ecosystems are poorly understood and little is known about their ecological functions and values.

Geology, biology, archaeology, hydrology, scientific exploration, and recreation are integral parts of cave ecosystem management. Each resource plays an important role in the ecology of caves, and these resources must be considered when describing the effects of human-induced changes to the ecosystem. It is necessary to preserve the integrity of cave resources while providing for multiple-use.

1.6.1 Geological/ Mineralogical/ Paleontological

Some caves on the District contain unique speleothems, including: helictites, folia, dog tooth spar, cave shields, anthodites, rimstone, mammillaries, cave pearls, and moonmilk. More common speleothems found in caves on the District include: stalagmites, stalactites, flowstone, soda straws, and columns. While only one cave on the District is known to have significant paleontological resources, other paleontological resources may be discovered in the future.

1.6.2 Biological

Biological resources, including a variety of sensitive and possibly endemic species, are another significant resource associated with caves on the District. These caves provide solitude, stable temperature and relative humidity levels, protection from predators, and hydrological conditions that provide habitat for many vertebrate and invertebrate species. Some wildlife and vegetation may be found only near cave entrances (e.g., mountain lions, bobcats, ringtail cats), whereas the interior of caves supports a wide variety of biota such as bats, packrats (or woodrats), snakes, insects (e.g., springtail and cave crickets) and microorganisms. It is probable that some of the caves on the District contain populations of invertebrates and microorganisms that have been undisturbed for thousands of years. Pristine cave ecosystems provide unique opportunities for scientific research and it is desirable to minimize disturbance of the delicate ecosystem from contaminants brought in by explorers or surface disturbances.

Many caves contain thick packrat middens which can accumulate over generations and provide information on previous climatic conditions. These well preserved specimens, sealed in clay, offer a unique opportunity to study the paleoecology of the Great Basin, enabling the reconstruction of the plant and animal communities that existed long ago.

Little is presently known about cave invertebrates and microbes in caves on the District. Anthropological impacts to cave invertebrates and microbes are not well understood. Studies have shown that physical trampling, compaction of soils, and introduction of organic materials (campfire wood, food particles, human hair, and waste products) can be deadly and/or highly disruptive to native cave microorganisms and the greater cave ecosystem (Northrup and Welbourn, 1997).

1.6.3 Cultural /Native American Use

Humans have interacted with some cave and rock shelter ecosystems for thousands of years. Caves within the Great Basin were frequently used by Native Americans for shelter, storage, and other uses. Signs of such activity can be found inside or around the openings of caves on the District. The time period of prehistoric uses could range from 12,000 years ago to the historic period. Native Americans also utilized caves for spiritual and religious purposes. Most caves are part of a larger cultural landscape that is traditionally significant to Native American culture and that association is not always evident to people outside of that specific culture.

Euro-Americans also used caves for shelter, storage, and other activities such as moon shining. During the 1920's and 1930's, more advanced technology, including flashlights, enabled adventurers to explore some of the deeper caves on the District. Better equipment, such as nylon ropes and related climbing gear, allowed deeper exploration of caves on the in the 1950's. As a direct result of the increasing numbers of cave visitors, many non-renewable formations found in the caves began to show signs of damage.

Additionally, decorative rock art is present along some of the rock faces and cliffs, both prehistoric and historic. By studying these resources, we can learn how humans have utilized the caves over the years, and observe how their use has affected the environment.

1.6.4 Hydrological

Water is an integral component of cave environments, whether currently present or not. Since photosynthesis cannot occur in caves, most nutrient materials must be brought in from the surface. Water serves a critical function by transporting inorganic and organic materials from the surface to the cave. Surface activities have the potential to impact subsurface habitats such as caves and groundwater. Cave hydrological systems have been impacted from historic human practices, such as dumping household and toxic wastes into sinkholes and cave entrances.

1.6.5 Educational/Scientific Research

Caves on the District provide excellent opportunities for educational and scientific research. Archaeological and historic resources can shed light on prehistoric and historic human use practices. Faunal remains and charcoal deposits can provide information on past climates and historic flora and fauna. Troglonemes (animals that habitually use caves but must return to the surface for living requirements) such as bats, can provide indications to the health of both surface and sub-surface environments. Troglonites (animals completing their entire life cycle in caves) and trogloniles (animals that complete their life cycle in caves or in suitable habitats outside caves) can provide valuable insights on evolutionary processes.

Researchers have recently made remarkable scientific discoveries in caves. For example, researchers have recently discovered antibiotic-resistant bacteria strains in Lechuguilla Cave (New Mexico), which could be used to treat currently untreatable infections (Mosher, 2012). Caves on the District have the potential to also contain bacterium resistant to antibiotics.

Furthermore, cave formations record climatic data. Examining this data may provide further understanding of past events and insight on what could happen if nature or humans alter the ecosystem.

1.6.7 Recreational

Recreation constitutes the majority of cave use on the District. Caves on the District provide a range of caving opportunities for different skill levels ranging from simple horizontal passages to difficult vertical or maze-type passages.

Recreational use of caves on the District is a historical use that dates back to the 19th century. Data collected from cave registers shows that recreational use is relatively low to moderate, but varies considerably between caves depending upon conditions such as accessibility, weather, popularity, and size. There are many local users, but non-local users are also attracted to caves on the District. Increasing national exposure for the resource and the recreational pressures of populations from out-of-state will likely cause a gradual overall increase in use.

1.7 CAVES ON THE DISTRICT

There are about 40 known undeveloped caves on the District. In addition to the known caves on the District, it is believed that there are countless other caves left to be discovered. Low population densities in Nevada combined with difficult access has led to many high probability karst areas (type of land form with high likelihood of caves) and visible caves left unexplored.

Caves on the District range in length from less than 100 feet to over 3,000 feet. Some of the entrances are large and visible for miles while others are small and well hidden. Cave registers show that caves on the District receive visits from multiple groups on some days, to only one or

two groups per year. While visitation to most caves on the District is generally low, three of the caves receive the majority of the use (Cave Valley Cave, Goshute Cave, and Whipple Cave). Most caves contain interesting features, including: rare speleothems, sensitive species, cultural resources, paleontological resources, and the possibility of endemic species. The following caves are indicated for management actions later in this Plan.

1.7.1 Cave Valley Cave

Accessibility: Easy – cave entrance is 50 feet from the parking lot.

Length: 3,000 feet

Vertical Component: None, except the pit at end and the viscous mud.

Significant: Yes.

The discovery of the Cave Valley Cave was in 1858 by a group of the White Mountain Expedition of the Latter Day Saints Church. The cave was explored and survey by the Wheeler Survey (1869) who found the length to be 3,000 feet, which makes it one of the longest single tunnels in Nevada. Due to its notable length and overall size, this cave offers excellent opportunities for educational and scientific use. Cave Valley Cave isn't famed for its beauty, but for the deep, viscous orange mud found in the latter half of the cave. This clay has been associated with unsuccessful mining ventures in the past. An estimated 500 feet of this cave crosses privately owned land.

Cavers will find exploration quite easy given its horizontal nature and lack of technical sections. This is a good cave for a beginning caver. Ease of accessibility, however, has led to an extensive amount of vandalism. Some of this vandalism includes historic signatures from the mid 1800's. However, there are also recent signatures and drawings found throughout the cave that have impacted the integrity of some of the earlier names and dates. There are close to 1,000 individual inscriptions in the cave, almost entirely within the first 700 feet of the cave, which is the dry section of the cave. Many of them can be tied to a specific date (year); ranging from 1859 to 2015. These inscriptions, whether historic markings or recent graffiti, illustrate the high visitation this cave receives. The inscriptions are of various types: red, blue, and black paint (1960's), orange spray paint (pre-1985), etching (as old as 1859 and recent evidence from 2015), carbide (early to mid-1900s), and pen ink (2011). Also, in the drier portion of the cave, there have been incidences of campfires being built, broken glass, and trash left behind. While much of this debris is modern, there is evidence to support historic and prehistoric use related to thermal features identified within the dry portion of the cave. In the muddy portion of the cave, different trash may be found: hundreds of yards of string, additional broken glass and trash, human waste, and discarded clothing and shoes. On a recent (2014) monitoring visit, a section of flagging tape was found calcifying into a stalagmite.

In addition to the caves cultural significance, Cave Valley Cave provides maternity and roosting habitat for several bat species and habitat for an invertebrate species that may be endemic to this cave. This cave also possesses quite a few fragile, but common, speleothems typically found in other caves on the District.

TABLE 1. CAVE VALLEY CAVE VISITATION

Year	# of People	# of Groups	Average Group Size
2000	143	29	5.0
2001	158	33	4.8
2002	89	21	4.2
*2003	66	13	5.1
*2004	59	24	2.5
*2005	13	5	2.6
*2006	85	16	5.3
*2007-2013	No register data		
*2014	29	9	3.2
Average	80.25	18.75	4.08

*- Indicates data gaps (missing register books or pages)

1.7.2 Goshute Cave

Accessibility: Moderate – the steep hike takes about half an hour from the trailhead to the cave entrance. There’s a short scramble to access the entrance.

Length: 1,000 feet

Vertical Component: None.

Significant: Yes.

While originally discovered in 1895 (or based on the dated inscription – 1865), the earliest survey of Goshute Cave wasn’t until 1967 by the Salt Lake Grotto. Early cavers labeled many of the formations and rooms with large block letters painted on the walls (eight locations). There is also recent vandalism found throughout the cave. An estimated 60 individual inscriptions, excluding the block letters, can be found throughout the cave and includes: red paint (1967), carbide, pencil, ink pen (2008), pink paint, sharpie (2002), soot (1996), and yellow crayon. There are also numerous handprints on formations and small sculptures made from the moon milk in the rear of the cave.

Goshute Cave appears to be receiving extensive visitation due to the amount of dust found on the cave formations near the cave’s entrance and the amount of visitors signing the register book.

Goshute Cave provides maternity, roosting, and winter habitat for several bat species as well as year-round habitat for additional fauna (e.g., packrats). This cave also contains hydrological features important to the biota and the development of the cave resources.

Both common and rare speleothems are present inside the cave. In one particular section of the cave, vandalism has occurred to some of the unique speleothems and there are muddy handprints covering the white cave walls.

TABLE 2. GOSHUTE CAVE VISITATION

Year	# of People	# of Groups	Average Group Size
2009	195	45	4.3
2010	205	39	5.3
2011	145	34	4.1
2012	171	43	4.0
2013	152	38	4.0
2014	154	37	4.2
Average	170.3	39.3	4.32

1.7.3 Leviathan Cave

Accessibility: Difficult – remote trailhead (2.5 hour hike to cave covers about 2 miles and 2,000 feet elevation gain).

Length: 1,400 feet

Vertical Component: Yes, there is a 30 feet rappel to access the cave entrance.

Significant: Yes.

Stories from local residents state that the cave had been first visited in the early 1940’s. The first recorded entry to the cave was in 1952. The 1960’s saw quite an increase in visitation, including Cave Research Associates from California, and the hydrologic-geologic expert, Alvin McLane. Nominations for cave protection began in 1967 to protect the area for its special geologic quality. This cave is said to have the largest opening of any cave in the western U.S. Due to its notable opening, this cave offers opportunities for educational and recreational use.

Inscriptions are primarily found on the flowstone near the entrance to the decorated room and include eight inscriptions in carbide. There are a few other scattered inscriptions, such as in the southeastern climb toward the top. There is also evidence of campfires being built against the wall (near the sign-in register) in the vast entrance opening. The decorated portion of the cave also shows evidence of vandalism in the form of broken formations.

Leviathan Cave contains water that is critical to the biota that uses the cave, especially bats. Leviathan Cave provides maternity and roosting habitat by at least two species of bats. The water found in the cave pool is the only source of drinkable water for these bats within a several mile radius, and certainly serves as a very important water source for them.

Cultural significance has yet to be thoroughly studied, but there are rumors of “wickiups” having been built in the entrance zone ages ago. Further, this cave meets the significant scientific criteria due to the paleontological resources and the extensive amount of unique and fragile speleothems present in the cave. The paleontological resources have also received damage in the past ten years.

TABLE 3. LEVIATHAN CAVE VISITATION

Year	# of People	# of Groups	Average Group Size
2000	35	5	7.0
2001	28	6	4.7
2002	16	7	2.3
2003	51	9	5.7
2004	21	4	5.3
2005	19	8	2.4
2006	40	11	3.6
2007	54	15	3.6
2008	47	13	3.6
2009	36	11	3.3
2010	11	5	2.2
2011	30	8	3.8
2012	19	6	3.2
2013	29	7	4.1
2014	6	2	3.0
Average	29.5	7.8	3.85

1.7.4 Pescio Cave

Accessibility: Easy – half hour hike over moderately steep ground.

Length: 500 feet

Technical: None.

Significant: Yes.

It is unknown when this cave was first visited. There are eight carbide initials at the entrance of the popcorn room, two etched signatures, two more carbide signatures in the back of the popcorn

room, and four carbide signatures (1955, 1966) in the central room largely covered by packrat urine (amberat). Most of the formations have been damaged or broken in this cave. The formations in the “popcorn room” have seen considerable damage with some 50 stalactites having been broken. Another three to four very sizeable stalagmites (over 4” diameter) have also been broken off the cave floor.

Pescio Cave has a double opening, which is a fairly unusual feature. Double openings provide the opportunity for bat species to use the cave as hibernaculum (a place where bats hibernate during the winter months). Pescio Cave possesses common speleothems that are still active. In certain sections of the cave, water is generally present. Paleontological resources are also present.

There are no serious hazards and the vertical drops are small. Dust and an abundance of packrat droppings may be the only disruption for recreationalists.

No visitor use data is available from this cave. A register book was installed in 2015.

1.7.5 Rose Guano Bat Cave

Accessibility: Easy – short hike from road to opening.

Length: 483 feet

Vertical Component: Yes, there is a ~50 foot drop between the two rooms. Also, requires respirator to avoid histoplasmosis (an infection caused by breathing in spores of a fungus often found in bird and bat droppings).

Significant: Yes.

Rose Guano Bat Cave is best known as home to the largest known colony of Brazilian free-tailed bats (*Tadarida brasiliensis*) in Nevada. While multiple bat species use this cave year-round, it is primarily used during the fall migration period by as many as 2 million bats. A colony this size consumes approximately 20 tons of insects nightly. Migration lasts from July through October each year. Maternity season by bats in this cave starts April 1st.

The cave itself consists of two large rooms, one of which has been mined extensively for bat guano. In 1926, an adit was tunneled from the hillside below the natural opening of the cave into the lowest part of the cave to extract the copious amounts of guano. This adit has since been closed to prevent human access.

No visitor use data is available for this cave.

1.7.6 Whipple Cave

Accessibility: Easy, level walk of 300 feet from parking area.

Length: 800 feet

Vertical Component: Yes, 60 feet rappel into cave entrance.

Significant: Yes.

Whipple Cave was discovered in 1906 by a local rancher, John L. Whipple. Since then, and despite the vertical drop at the entrance, the cave has been very popular and was visited by Masonic and Lion’s Clubs in the early part of the 20th century. Boy Scouts of America and branches of the National Speleological Society (NSS) have often visited the cave over the years due to its educational and scientific value.

The cave’s double entrance consists of two huge holes separated by a natural stone bridge. Beneath the bridge, the two mouths merge into one great gullet-like shaft, the west wall of which is an 85 degree inclines (almost vertical), for the first 50 feet. There is a variety of common and unique speleothems found throughout the cave. In a section of the cave, one can locate the massive forty-foot column, which may have taken some 20 million years to form.

Whipple Cave provides maternity and roosting habitat for several bat species and year-round habitat for other fauna (e.g., packrats) native to caves. Bats found in Whipple Cave are especially prone to human disturbance as most recreationalists come during maternity season. In the summer of 2013, cavers found 22 dead and dying bats and pups (their young) near the entrance of Whipple Cave. A Nevada Department of Wildlife (NDOW) bat biologist believes that human disturbance, due to large groups, is the likely cause of this bat die-off.

TABLE 4. WHIPPLE CAVE VISITATION

Year	# of People	# of Groups	Average Group Size
2011	157	33	4.8
2012	79	19	4.2
2013	130	17	7.6
2014	198	24	8.25
Average	141	23.25	6.21

1.8 SIGNIFICANT CAVES

Currently, the EYDO maintains a list of ten “significant caves” categorized according to the significance resource criteria that are listed in Section 1.3.

Caves will be inventoried and evaluated as part of an ongoing process districtwide under provisions of the FCRPA to determine additional significant resources. If new significant features are classified in known or additional caves, the EYDO would revisit and update the significant cave list as needed.

Confidentiality: The FCRPA authorizes the Secretary of the Interior to withhold information concerning cave locations under certain circumstances. 43 CFR Part 37, Subpart B: 37.12 (a), states, "No Department of the Interior employee shall disclose information that could be used to determine the location of any significant cave or cave under consideration for determination, unless the authorized officer determines that disclosure will further the purposes of the Act and will not create a substantial risk to cave resources of harm, theft, or destruction." Furthermore, Part 37.12 (c) states, "Decisions to permit or deny access to confidential cave information are made at the sole discretion of the authorized officer and are not subject to further administrative review or appeal under 5 U.S.C. 552 (Freedom of Information Act) or 43 CFR Parts 2 or 4."

The EYDO will not disclose specific location information about significant caves to the general public. This information will be treated as confidential and secured in a locking file cabinet to prevent access by non-authorized persons. Exceptions to this policy are described by 43 CFR Part 37, Subpart B: 37(b) Requesting confidential information, "...the authorized officer may make confidential cave information available to a Federal or State governmental agency, bona fide educational or research institute, or individual or organization assisting the land managing agency with cave management activities. To request confidential cave information, such entities shall make a written request to the authorized officer that includes the following;

- 1) Name, address, and telephone number of the individual responsible for the security of the information received.
- 2) A legal description of the area for which the information is sought.
- 3) A statement of the purpose for which the information is sought, and
- 4) Written assurances that the requesting party will maintain the confidentiality of the information and protect the cave and its resources."

CHAPTER 2: MANAGEMENT DIRECTION AND OBJECTIVES

The BLM's mission is to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations. The EYDO's primary objective for cave resource management is to manage public lands in a manner which will protect cave resources such as life forms, cultural, paleontological, speleothems, and other significant cave resources while allowing for respectful recreational and scientific use.

2.1 OBJECTIVES

Protection

1. Manage caves as non-renewable resources to maintain their geological, scenic, educational, cultural, biological, hydrological, paleontological, and recreational values in accordance with applicable laws, regulations, manuals, and current guidelines such as the FCRPA, 43 CFR Part 37, and BLM Manual 8380.
2. Protect all significant cave and karst resources on the District, in accordance with applicable laws. Known caves will continue to be inventoried and evaluated under provisions of FCRPA, 43 CFR Part 37, and BLM Manual 8380 to determine resources, condition, and significance, which will be used to develop and re-evaluate management prescriptions, as needed. Newly discovered caves will also be monitored, as they are discovered and/or as resource values are identified.
3. Regulate or prohibit uses that would cause significant resource damage to cave systems. These uses may include mining, oil and gas exploration, land actions (e.g., Right-of-Ways with surface disturbance above or near caves or projects that change the hydrologic systems connected to caves), grazing or range developments, research (e.g., archaeological or paleontological), and commercial uses.
4. Restore altered or vandalized cave systems to a more natural appearing condition, where this is feasible.
5. Known caves and newly discovered caves will continue to be inventoried and evaluated districtwide under provisions of 43 CFR Part 37 and BLM Manual 8380 to determine resources, condition, and significance, which will be used to develop management actions.
6. Secure all cave-related documents to protect confidential information.

Recreation

7. Manage caves in an undeveloped condition to provide a high quality recreational experience, while preserving the integrity of the caves.
8. Promote respectful recreational use of appropriate caves on the District through education and outreach programs while maintaining healthy cave ecosystems.
9. Develop and distribute appropriate interpretive information to educate the public about regulations, safety issues, cave resources, responsible caving ethic (e.g., *Leave No Trace*), and White-Nose Syndrome (WNS).

Partnerships

10. Develop and foster communications, cooperation, and volunteerism with interested publics, Federal agencies, Native American Tribes, and local governments.
11. Utilize volunteer resources where feasible to augment BLM staff resources and management of caves on the District. Utilize volunteer assistance for inventory, surveys, monitoring, maintenance, clean up, restoration, gate installation and repairs.
12. Promote cooperative management agreements and the exchange of information with the scientific and recreational caving communities.

Safety

13. Provide for public health and safety while recognizing that part of the recreation experience inherently involves risk taking.
14. Institute a Search and Rescue Plan in coordination with local experts and law enforcement agencies to provide support in search and rescue operations.
15. Develop Risks and Stipulations sheets for caves requiring permits.
16. Follow BLM Cave Safety Standards internally.
17. Provide training for BLM personnel involved in cave resources management.

CHAPTER 3: PLANNED MANAGEMENT ACTIONS

The aim of the Cave Management Program is to manage caves on public lands under the direction and objectives listed in Part 2. Emphasis will be placed on maintaining the caves in their natural state. Adaptive management would be used for implementation of this Plan. Adaptive management, as defined by the Natural Resource Council whose definition was adopted by the Department of Interior, is a process that promotes flexible decision making that can be adjusted in the face of uncertainties as outcomes from management actions and other events become better understood. Careful monitoring of these outcomes both advances scientific understanding and helps adjust policies or operations as part of an iterative learning process.

Adaptive management also recognizes that uncertainties arise with incomplete control of management actions, environmental variability, and an incomplete understanding of system dynamics. It is not a ‘trial and error’ process, but rather emphasizes learning while doing. Adaptive management does not represent an end in itself, but rather a means to achieve more effective decisions and enhanced benefits. Its true measure is in how well it helps meet environmental, social, and economic goals, increases scientific knowledge, and reduces tensions among stakeholders.

Given the ongoing nature of cave management and the need to be flexible in how caves and cave resources are managed, adaptive management allows the use of monitoring to guide management. Monitoring cave resources to gain baseline data will allow a better understanding of use and may guide adaptive management actions. Additionally, monitoring visitor use and impacts to cave resources (e.g., cave formations, vandalism, biota, or water quality) will allow for implementing or adjusting visitor use restrictions (e.g., group size limits or frequency of visits).

A trigger point is a predetermined decision point that is built into the decision-making framework at the outset (i.e., if this, then what) (Nie and Schultz, 2011). Trigger points represent a threshold indicating that management changes are needed to address impacts to cave resources. If a trigger point is reached, the EYDO would apply additional mitigation measures, or, in certain instances, immediate action may be necessary to stop a severe deviation from cave management objectives.

The remainder of Chapter 3 is organized into specific management actions, and lays out general guidance. The guidance therein presents a description of the action, methods for ensuring cave protection, and the triggers point(s) identified for future action. This chapter is followed by the site-specific actions, where they are proposed at this time. Site-specific actions may be developed for other caves in the future, and would be reviewed through the NEPA process at that time.

Implementation of the site-specific proposed management actions would be dependent upon funding and staffing availability. Following completion of this Plan, an implementation strategy, schedule, and prioritization of projects would be completed.

3.1 CAVE INVENTORY

Since a cave system is a delicate interaction of many resources, it is necessary to understand these resources and how they interact in order to effectively manage caves. The EYDO has a standardized cave inventory file system for the known caves on the District. The cave inventory file system consists of several parts. The first part is made up of general information such as: cave elevation, type of cave, length of passage, hazards, accurate GPS coordinates, etc. The second part of the inventory consists of the special reports on the cave resources found within caves on the District (see Appendix 3 for General Inventory Procedures).

The EYDO cave inventory file system would continue to be updated for each cave to centrally locate all the information gathered. These cave files will be permanently retained in the EYDO. Cave files are treated as confidential and are secured in a locking file cabinet to prevent access by non-authorized persons.

The files would include all known caves on the District. The files would include monitoring reports, photos, maps, known hazards, resource concerns, news media articles, register pages, trip reports, and any additional information concerning the cave. The cave files may also identify monitoring schedules for each cave. As appropriate, the EYDO may develop cave-specific management plan(s); these plans would be included in the cave files. Subsequent cave plans, if determined necessary, would include further management prescriptions (e.g., gates or cave use permits).

3.1.1 Cave Markers

At a minimum, the EYDO would mark all significant caves with a monument (e.g., brass cap or project marker) at or near the entrance of the cave. Monuments would be used to map and survey caves, and incorporate them into the National Spatial Reference System.

3.2 SURFACE CAVE MANAGEMENT

The surface above and near the cave would be managed with the cave resources in mind since the two are interconnected. There could be some limits, mitigation measures or constraints placed on conflicting resource uses in accordance with the National Environmental Policy Act (NEPA).

3.2.1 Withdrawals

The significance of some caves warrants their protection. The management tool that best protects caves and their immediate environs is a legislated withdrawal or a Secretarial withdrawal as provided in Federal Land Policy and Management Act (FLPMA) Section 204. A

withdrawal can provide protection from all forms of entry, appropriation, disposal, and patent that are allowed by the mining and public land laws.

In 1970, four caves on the District were designated as Geologic Areas under a Federal Register Notice (1970 FRN) (Volume 35, No. 247): these four areas included Leviathan Cave, Whipple Cave, Cave Valley Cave, and Goshute Cave. They were given partial protection by being “[segregated] from disposal under the public land laws, but not the Recreation and Public Purpose Act [(R&PP)] or the mineral leasing and material sale laws.” Under the same Federal Register Notice, Bat Cave and Guano Mine (also known as Rose Guano Bat Cave) was designated as a Historic Area and Snake Creek Indian Burial Cave was designated as an Archaeological Site with the same segregation provisions as the Geologic Sites.

The RMP released the four geologic areas segregated and given special designation in the 1970 FRN. The RMP overlooked the release of three of these sites in the 1983 FRN. Conversely, Rose Guano Bat Cave and Snake Creek Indian Burial Cave were not released in the 1983 FRN or the RMP and remain “segregated from all appropriation including the mining laws but not the R&PP nor the mineral leasing and material sale laws” through the 1983 FRN. These two caves were designated ACECs in the RMP and should be withdrawn for adequate management and protection. The RMP states that, “Section 202(c)(3) of [FLPMA] mandates that priority be given to the designation and protection of ACECs. These areas are defined in Section 103(a) as areas where special management attention is required to protect and prevent irreparable damage to important values, resources, systems or processes, or to protect life and safety from natural hazards.” Although the 1983 FRN segregation does not have an expiration date, segregation is typically an interim status while pursuing a FLPMA withdrawal. Secretarial withdrawals allowed under FLPMA are effective for 20 years and need to be extended prior to their expiration to retain their protections.

The 1983 Federal Register Notice (Volume 48, No. 197) (1983 FRN) vacated the segregation for Leviathan Cave, Whipple Cave, and Cave Valley Cave, leaving them without protection. The 1983 FRN extended indefinitely the segregation of Goshute Cave, Bat Cave and Guano Mine, and Snake Creek Indian Burial Cave. In time, Leviathan Cave, Whipple Cave, and Goshute Cave received withdrawal protection. Cave Valley Cave has been without segregation or withdrawal protection since 1983.

In 2004, the Lincoln County Conservation Recreation and Development Act, Public Law 108-424, designated wilderness areas in Lincoln County that included Whipple Cave, Leviathan Cave, Lavender Cave, and Weepah Cave. The act includes a withdrawal of the wildernesses, hence protecting the caves from “(1) all forms of entry, appropriation, and disposal under the public land laws; (2) location, entry and patent under the mining laws; and (3) operation of the mineral leasing and geothermal leasing laws.”

In 2006, the White Pine County Conservation Recreation and Development Act (WPCCRDA), Public Law 109-432, designated wilderness areas in White Pine County that included Goshute

Cave, Angel of Death Cave, and Ninemile 1, 2, and 3 Caves. The act includes a withdrawal of the wildernesses from “(1) all forms of entry, appropriation, and disposal under the public land laws; (2) location, entry, and patent under the mining laws; and (3) operation of the mineral leasing and geothermal leasing laws.”

WPCCRDA also transferred jurisdiction of public lands containing Owl Rock Shelter Cave and Forgotten Cave from the Forest Service to the BLM. The transferred lands are also subject to a withdrawal, protecting the caves “from all forms of— (1) entry, appropriation, or disposal under the public land laws; (2) location, entry, and patent under the mining laws; and (3) operation of the mineral laws, geothermal leasing laws, and mineral materials laws.”

The Basin and Range National Monument was designated on July 10, 2015 under the authority of the Antiquities Act. This designation encompasses several known caves, including: Queen of Sheba, Mutha, Sista, Leviathan, and Lavender. The Monument proclamation states, “All Federal lands and interests in lands within the boundaries of the monument were appropriated and withdrawn from all forms of entry, location, selection, sale, or other disposition under the public land laws, from location, entry and patent under the mining laws, and from disposition under all laws relating to mineral and geothermal leasing, or other than by exchange that furthers the protective purposes of the monument.” This Plan may need to be amended after the Basin and Range National Monument’s Resource Management Plan is approved.

3.2.1.1 Site-Specific Actions

The BLM will seek to withdraw the currently segregated caves (Snake Creek Indian Burial Cave and Rose Guano Bat Cave) to protect them from all forms of entry, appropriation, and disposal under the public land laws; location, entry and patent under the mining laws; and operation of the mineral leasing and geothermal leasing laws. Goshute Cave is in wilderness and is protected by the wilderness withdrawal in WPCCRDA. It needs to have the 1983 FRN segregation vacated. Additionally, the BLM will pursue withdrawal of Cave Valley Cave from mining and public land laws seeking the same protections stated above. Two of the caves (Pescio Cave and Valley View Cave) with current oil and gas leases would be considered for withdrawal protections when those leases expire, and an RMP amendment will be sought to close the area encompassing the cave to fluid mineral leasing.

3.2.2 Land Actions

Significant caves on the District would remain in public ownership. Surface or subterranean activities affecting cave resources will be analyzed for their potential impacts to cave and karst systems, including karst aquifers.

3.2.3 Use of Chemicals

Fire Retardant– The EYDO will ensure that fire and resource personnel have the most recent Geographic Information System shapefiles (which will be kept confidential), so they know which areas contain cave resources.

Sensitivity to retardant use and fire suppression actions may vary between caves due to differences in size, location, and biotic and abiotic factors within each cave system. Also, the effects of retardant and fire suppression activities may be less damaging to cave resources than direct and indirect impacts of a fire. As such, fire suppression actions would be carefully analyzed by Incident Commanders, Resource Advisors, and fire management staff in an attempt to assess overall positive and negative effects and avoid negative impacts to cave resources.

Future cave monitoring and mapping may allow for more accurate direction concerning fire management near cave resources. Once additional site-specific monitoring has occurred, data has been analyzed and potentially affected resources are identified, this Plan may be amended to establish site-specific management actions to be followed during fire suppression activities.

Herbicide Use– The use of herbicide would be carefully analyzed to avoid impacts to cave resources. Should noxious and invasive weed issues arise near cave resources, weed control methods will be analyzed on a site-specific basis to ensure the appropriate methods are used.

Future cave monitoring and mapping may allow for more accurate direction concerning herbicide use. Once additional site-specific monitoring has occurred, data has been analyzed and potentially affected resources are identified, this Plan may be amended to establish site-specific management actions to be followed during herbicide application.

3.2.4 Range Improvement Projects

Projects such as water diversions or vegetation conversions, which could affect caves by altering the natural flow of water, soil or other nutrients into these cave systems, would be carefully reviewed to assess possible adverse effects on cave resources during the NEPA process.

3.2.5 Mineral Exploration and Development

Any type of mineral exploration or development, or seismic exploration activity, would be carefully reviewed to assess possible adverse effects on cave resources during the NEPA process.

Mineral Leasing– Exploration and development of leasable minerals require submittal of an acceptable Application for Permit to Drill (APD). Impacts to cave resources should be considered in the application review and associated NEPA analysis. Conditions of approval for the APD should include considerations of significant cave resources (e.g., buffer zones to protect known cave resources from surface disturbance and subsurface development; protection of subsurface areas with *high probability* of containing undiscovered cave resources). Lands

including significant cave resources, including buffers, should be withdrawn from mineral leasing; alternatively, portions of parcels proposed for leasing should be deferred.

Locatable Minerals– Location of mining claims on federal lands is allowable unless special designation (e.g., withdrawal from mineral entry). Exploration of mining claims is regulated under a mining Notice of Intent to conduct mineral exploration and is not an authorized federal action. However, the exploration activities must not cause Unnecessary or Undue Degradation of other resources. While, generally, discussions will allow modifications to the exploration plan that will avoid impacts to cave resources, there may be situations where other mitigation measures are required and would be identified during the NEPA process. Development of mineral resources is regulated under a Plan of Operations; impacts to cave resources should be analyzed in the NEPA process. Requirements which protect the resources may be included as Plan modifications or Conditions of Approval. There may be situations where other mitigation measures are necessary (e.g., ore body or operation surrounds or includes cave resources).

Mineral Material Sales– Mineral material sales are discretionary actions and cave resources should be considered during analysis. If cave resources could be impacted, the EYDO will work with the proponent to mitigate any impacts.

3.2.6 Recreation

Limits may have to be placed on recreational use when that use causes unacceptable change to the cave resources. Numerous actions could be taken to control recreational use. Refer to the Visitor Use Management Section (3.5) for additional information.

3.3 RESOURCE MONITORING

Cave resource monitoring is the primary means of detecting changes in the cave environment over time. Cave resource monitoring is currently led by the Outdoor Recreation Planners and supported by field office staff and will be guided by the EYDO Cave Monitoring Procedures (see Appendix 4). Additionally, monitoring may be supported by volunteers, Grottos or local caving groups associated with the NSS, NDOW biologists, and other agencies. The information from the monitoring would be used to preserve and protect resources through future management actions.

3.3.1 Photo Monitoring

Photo monitoring is the most common approach to track the various activities which many impact caves. Photo monitoring involves repeatedly photographing cave features at fixed points within a cave from the same distance and angle. Areas to target include high use areas, pristine and fragile areas, areas with special resource concerns, such as archeological or paleontological resources, and areas that have received restoration from past damage(s). One method of photo monitoring would be to establish photo points during a visit, then utilize those photos and a written description to guide the subsequent monitoring visits. Alternatively, these points may be

indicated with small caps or stakes unobtrusively placed within the caves where it is appropriate, and logistically possible. This will enable photos to be taken from exactly the same location each year. This method allows the visual conditions of cave features to be compared over time and can be used to determine management needs such as trail marking, increased education, or other management actions. To help implement photo monitoring efforts, the EYDO could utilize volunteers and Grotto members in addition to BLM and other agency staff, depending on their expertise.

3.3.1.1 Site-Specific Action

The following five caves would be initially targeted for establishing photo monitoring points: Cave Valley Cave, Goshute Cave, Pescio Cave, Leviathan Cave, and Whipple Cave. Photo monitoring would occur annually.

3.3.2 Impact Monitoring

Impact monitoring uses a detailed cave map, which includes the cave entrance area, to depict impacts to sensitive resources such as speleothems, archaeological and paleontological sites. Impact maps show areas of the cave which are impacted or pristine. Over time, regular impact mapping can detect physical changes to cave resources and help determine whether current use levels are acceptable.

3.3.2.1 Site-Specific Action

The following five caves would be the priority for impact monitoring as they receive the majority of visitation: Cave Valley Cave, Goshute Cave, Pescio Cave, Leviathan Cave, and Whipple Cave. Impact monitoring would occur annually.

3.3.3 Biological Monitoring

A biological inventory needs to be completed, with priority given to the significant caves on the District, to determine the different types of cave flora and fauna present. This information will help the EYDO prioritize (e.g., which species are vulnerable or sensitive) and conduct biological monitoring in the future. The EYDO will also monitor some of the more common species for baseline stability.

Since caves are closed ecosystems with low energy input and are naturally extremely slow to change, biological monitoring can detect disturbances and indicate the need for management actions. The flora and fauna of caves are highly specialized and adapted for survival in cave environments. Because of this specialization, the expertise for evaluating these biologic resources may not be found in EYDO personnel. Biological monitoring could be contracted or done by interested researchers (e.g., NDOW or a university). Monitoring could include every aspect of the biological community in the cave, including: arthropods, isopods, and microorganisms, as well as larger cave life such as salamanders and other megafauna. It is also

possible that threatened or endangered species could be encountered. Special management considerations would be needed in this case.

3.3.4 Bat Monitoring

To better understand bat use of caves on the District, comprehensive bat monitoring has been initiated by NDOW. Baseline bat monitoring and surveillance is currently being conducted. Current techniques include bat counts in caves with summer roosts, maternity colonies, bachelor roosts, and hibernaculum, as well as the collection of bat species use in significant caves. For details on WNS monitoring and BLM response, see the White-Nose Syndrome Section (3.13).

Future monitoring efforts could include mist netting, infrared cameras, and acoustic surveillance. An acoustic surveillance approach would develop a baseline of winter activity at known hibernacula, which could then be used to monitor changes in activity that indicate possible emergence of WNS. Data being collected would continue to assist the EYDO with knowledge of caves with significant bat use.

3.3.5 Hydrological Monitoring

Water is a critical element in cave formation and it is important to understand the hydrological systems in which caves on the District are located. Hydrological systems are vulnerable to degradation from surface activities and visitation. Seemingly minor unrelated actions on the surface can have dramatic impacts on the caves below.

Water samples for baseline data would be collected in caves with water sources. Turbidity, pH, temperature, dissolved oxygen, and electrical conductivity, will be monitored periodically to quantitatively measure any changes within the caves. Water quality will be monitored for the presence of pesticides, herbicides, fertilizers, hydrocarbons, and other pollutants in areas where contamination is present. Water quantity would be studied and a baseline established using data loggers (e.g., HOBO) designed to record water level, barometric pressure, and temperature.

3.3.5.1 Site-Specific Actions

Data loggers would be installed in water sources at Forgotten Cave and Leviathan Cave.

3.3.6 Cultural and Paleontological Monitoring

The frequency of monitoring would be determined between the Archaeologist and Outdoor Recreation Planner, and dependent upon the resource's significance, level of preservation, and amount of visitation received. Highly sensitive resources would be avoided by project design. If avoidance is not possible, adverse effects to archaeological sites would be mitigated. At a minimum, sensitive resources would be monitored regularly. Monitoring of less sensitive resources would be determined on a case-by-case basis.

3.3.7 Cave Climate Monitoring

Temperature, humidity, evaporation rate, and air flow can be critical to wildlife use, mineral growth, and preservation of artifacts. Since 2013, humidity and temperature sensors have been installed in five caves to measure climatic changes within the cave and to better understand the likelihood of WNS arriving in Nevada. Other caves may be monitored in the future with priority given to those with bat use. Cave climate may also be monitored where it is suspected that human activities might alter cave climate, temperature, humidity, and evaporation.

3.4 VISITOR USE

Use of caves by humans can have detrimental impacts upon cave resources without proper management. Monitoring results can serve as indicators to the suitability of present management of a cave, and/or the need for management changes.

In accordance with this Plan, the schedule and scope of visitor use monitoring would be determined and conducted by Outdoor Recreation Planners, and supported by field office staff, volunteers, NSS members, and/or other agency specialists. Given budget and staff constraints, general monitoring techniques would be simple, consistent, and easily duplicated. Visitor use monitoring would occur annually in significant caves and on a case-by-case basis in known caves.

Currently, a cave monitoring trip report is filled out each time the EYDO staff, or a group working in conjunction with the EYDO, visits one of the caves on the District (see Appendix 5 for EYDO Cave Monitoring Trip Report). This allows the EYDO to keep track of vandalism, observed cave flora and fauna, water levels, etc.

3.4.1 Visitor Use Monitoring

Registers are a simple and relatively effective technique of determining visitation to specific caves. Cave registers can also be used to provide information about the cave. This method is inexpensive and quickly monitored if the register is placed near the cave entrance. Registers are currently installed in seven caves on the District and would be installed in additional caves that are thought to be receiving regular visitor use. This evidence may include footprints, trails, trash, and vandalism. Studies have shown that graffiti on cave walls and formations can be reduced if there is a register where people can sign their names or "leave their mark."

On each cave monitoring trip, register pages would be photographed. Full register pages would be removed and filed in the EYDO's cave files. Conservation messages (e.g., *Leave No Trace*) would continue to be placed inside visitor registers to inform visitors of responsible caving practices.

A degree of non-compliance should be expected, as some visitors will not complete the register. Based on research regarding trailhead registers, voluntary sign-in compliance varied due to

several factors, such as time of day, location of register, and primary activity (Deveny, 2015; Leatherberry and Lime, 1981; Lucas, 1983; Petersen, 1985). Compliance estimates varied from 64-72% in one study, to 18-89% in another. Deveny studied cave register compliance in Nevada and found an estimated 25% of visitors signed the cave registers; however, this number was skewed due to frequent tampering with cave register books (pages missing or books stolen).

Visitor register data may be validated using a trail counter or similar electronic device if more accurate information is required to make management decisions.

3.5 VISITOR USE MANAGEMENT

The EYDO will manage caves in an undeveloped condition to provide a high quality recreational experience, and ensure the appearance of naturalness. As monitoring indicates damage to cave resources, or impacts to visitor enjoyment, a variety of management techniques would be used to protect valuable cave resources. These may be used in different combinations or individual techniques may be altered within the parameters described to achieve the resource management objectives. The following are the techniques that could be used for caves on the District.

3.5.1 Carrying Capacity

Caves have a limited self-cleaning ability; however, if many people visit in a short period of time, the cave environment may be damaged (e.g., accidental formation breakage occurring from too many people in small delicate areas). Carrying capacity refers to the number of visitors that a cave can support and still retain its unique qualities without detrimental effects (i.e., geologic formations, animal and ecosystem life, cultural, and paleontological resources). A carrying capacity determination guides restrictions on cave use frequency, group size, and seasonality of use. A number of factors contribute to the determination of a particular cave's carrying capacity, including: cave size, fragility of the cave, resource sensitivity, environmental hazards, technical difficulty of cave passages, and general safety concerns.

The minimum number per group is recommended to be three persons to increase visitor safety (see Section 3.6). A group of one or two greatly reduces the ability for cavers to deal with an emergency circumstance, therefore, it is never recommended to cave alone. Group size limitations will be reviewed and modified as needed by the EYDO as new information is obtained through cave inventory data, monitoring of resource conditions, and resource reports of particular cave sites.

3.5.1.1 Site-Specific Actions

Based on the initial understanding of the carrying capacity of caves on the District, the number of visitors allowed at any one time is limited to a maximum of eight persons per group for almost all caves on the District. This maximum number is valid for the EYDO based on safety, the general size of caves on the District, the durability of the caves, and is reasonable for these

caves to minimize impacts. Whipple Cave and Cave Valley Cave are larger caves, and contain fewer highly fragile formations; therefore, due to their size, and durability, these two caves will have a maximum group size limit of 12 persons.

Frequency of visitation is set at no more than one group per week for the caves found in Table 5. The week timeframe is set at Monday through Sunday, which would allow the caves enough time to recover after each cave trip.

Allowances may be made on a case-by-case basis for groups that exceed the group size limit of 8 or 12 persons. Requests for exceptions must be submitted in writing, at least three weeks prior to the proposed trip and approved by an Authorized Officer.

Considerations for larger groups:

- Is the group organized?
- Is there a leader that has visited the cave before? Experience in caving?
- Are they familiar with proper caving principles and safety?
- Can they split into smaller groups and visit on separate days?
- Does the group have specific rules/practices that will reduce or avoid impacts to the cave?

3.5.2 Cave Use Permits

Cave use permits are a frequently used tool to control visitor use within caves on other Districts. On this District, cave use permits could be required for caves with highly sensitive, fragile or vulnerable resources (e.g., presence of bat colonies requiring seasonal or year-round protection or highly fragile cave formations), or for caves with known safety hazards. Monitoring of visitor use and impacts to cave resources may lead to a permit system being implemented on other caves on the District. Establishing a permit system would allow the EYDO to manage use in these caves, and adjust limits on group size and frequency of visitations, as needed to protect the resources within the caves. Permits provide an avenue to obtain visitor use data, to control use at sensitive caves, and to educate visitors about resources, safety concerns, and responsible caving. Permit systems may be either self-issue, on-site permits or office-issued. Office-issued permits are required to be obtained through the EYDO, which requires an application (see Appendix 6 for Cave Use Permit). Self-issued permits may be appropriate for some caves, such as those at remote locations or with low visitation, while being able to educate.

3.5.2.1 Site-Specific Actions

Based on the inventory and evaluation of caves on the District, an office-issued, cave use permit system will be established for Cave Valley Cave, Goshute Cave, and Whipple Cave. The office-issued permits would be free, but mandatory. The EYDO has identified these caves based on visitor use monitoring and identification of significant resource values. Monitoring has demonstrated resource damage concerns and recreational pressures. The permit system is being

established to better manage recreational use while helping protect cave resources within the caves on the District. Signs will be placed outside each of the three caves to inform the public of the mandatory office-issued permit system. Other caves may be subject to permits as additional resources or issues are identified.

For office-issued permits, visitors would be required to complete the cave use permit application and submit it to the EYDO. The EYDO would maintain a calendar of use to comply with the frequency of visitation requirements (e.g., one party per week). There will not be a minimum time requirement for applying; however, the criteria listed in the General Requirements section of the cave use permit application must be met (Appendix 6). In accordance with the safety recommendations (see Safety Section 3.6), the Authorized Officer should carefully consider requests for parties that are below the recommended three person group size recommendation. For example, highly experienced cavers who have been in the cave before may be allowed to visit in groups less than three.

The party would be required to have the permit on hand during their visit to the caves identified above. Following a cave trip, it is strongly recommended that the group submits a post-use trip report (see Appendix 6) to include date of visit, number of visitors, and resource issues encountered (e.g., vandalism or animal mortality). This report will help the EYDO with monitoring efforts.

Self-issued permit stations will be established at Pescio Cave and Leviathan Cave. Signs, permits, and permit receptacles would be erected at each trailhead. These permits would also be free, but mandatory. For these caves with self-issued permits, the frequency of visitation would be recommended to be one party per week. However, the EYDO would be unable to manage to this level under this type of permit system. Visitors would also be unaware of the last visitation in order to manage themselves. If monitoring indicates that the frequency of visitation is significantly higher (e.g., three groups per week) than the goal of one group per week, the EYDO may adaptively manage to reduce the frequency. Actions as described in the bullet points following the next paragraph may be implemented.

Visitor use restrictions will be revisited at periodic intervals to determine the level of permit and (in cave) register sign-in compliance, particularly for the un-gated caves. In the first five years following this Plan, the EYDO will determine baseline compliance for the permit system and register logs. The data from trail counters, register counts, and permits will be used to determine cave-by-cave compliance. If the data illustrates that less than 60% of visitors are obtaining the mandatory permits for the five listed caves (trigger point), adaptive management techniques may be applied, including, but not limited to:

- Increased public awareness campaigns
- Adjusting visitor use numbers (group sizes, frequency of visits)
- Increased law enforcement
- Re-evaluate the adequacy of the permit system

- Cave closures
- Installation of cave gates

TABLE 5. SUMMARY OF VISITOR USE POLICY

Cave	Group Size Limit	Frequency	Permit System Type
Cave Valley	12	1/week	Office-Issued
Goshute	8	1/week	Office-Issued
Leviathan	8	1/week	Self-Issued
Pescio	8	1/week	Self-Issued
Whipple	12	1/week	Office-Issued

3.5.3 Cave Gates and Cave Closures

Extreme situations may arise where it would be necessary to close a cave to recreational use for visitor safety or to protect fragile resources, such as speleothems, cultural and paleontological resources, and biological resources (e.g., sensitive bat species).

Caving activities could easily disrupt any type of critical bat roost. Cave-roosting bats are vulnerable to disturbance in their roosts, especially during hibernation and the birthing season (Thomas, 1995). During hibernation, bats naturally lose weight, but human disturbance can exacerbate weight loss, resulting in mortality (Tuttle, 1994). Bat nurseries are delicate biological resources which need protection during the time when pups are dependent on their parent. To help resolve the conflict between disruptive cave visitation and the safety of bat nurseries, seasonal cave closures may be a management tool taken by the EYDO. Closure dates may vary depending on monitoring of bat activity. Typical maternity bat activity is present May through September. If any caves on the District are determined to be significant hibernacula or visitation is shown to be impacting hibernating bats, the EYDO would consider placing seasonal closures on these caves for the winter months to protect hibernating bats. Seasonal closures may be implemented from October 1 through May 1 (as indicated in the BLM Containment and Decontamination Procedures in Appendix 7) or refined for the specific cave’s hibernacula dates. To authorize seasonal closures, the seasonal closure dates will be published in the Federal Register to inform the general public.

Cave gates are commonly used for implementing cave closures. With proper design and maintenance, cave gates provide an effective way to protect fragile resources. Cave gates would be used where the need is considered essential to protect cave resources or human health, such as:

- Sensitive bat colonies
- Native American burial sites or other significant cultural resources
- Endemic species

- Threatened or Endangered Species
- Geologic or paleontological resources
- To manage visitor use within a cave
- Safety concerns

Gates would be designed and installed to the current standards (Fant, J., Kennedy, J., Powers, Jr., and Elliot, W., 2009) for minimal disruption of wildlife (e.g., bats), nutrient flow, and air flow.

Currently, two caves on the District have been gated: Queen of Sheba Cave for protection of cave integrity and Snake Creek Indian Burial Cave for protection of cultural resources and Native American tribal concerns. These cave gates would be monitored annually, if not more frequently, to ensure they remain intact. Any additional permanent cave gate projects on the District would undergo site-specific NEPA analysis.

3.5.3.1 Site-Specific Actions

The following caves are proposed for permanent gates or closures, which would be managed as described. The remaining caves on the District (whether with other visitor use restrictions or not) do not currently warrant gating or closures based on monitoring. The guidance stated above would be used to determine future cave gates or closures.

Goshute Cave

Visitation is causing excessive dust in the entrance room of the cave, resulting in formations within Goshute Cave being impacted. Dust may also impact cultural and biological resources, and visitor satisfaction (Ohmns, 2005). When visitors pass through the dusty portion of the cave, a large amount of dust becomes airborne. The dust coats the formations throughout this portion of the cave. As large groups move through the area, more dust is disturbed and more formations are impacted. Goshute Cave is proposed to be gated to better control the visitation and reduce the impacts to the formations by the dust. The gate would be designed as bat-friendly to allow for the safe passage of bats.

Cave Valley Cave

This Plan proposes to gate Cave Valley Cave's entrance to protect significant cultural resources within the cave. This gate would be secured year-round and would require an office-issued permit to obtain access (see Section 3.5.2.1). Additionally, this cave has a side-passage near the entrance, which is used by maternity colonies of Townsend's big-eared bats (*Cornynorhinus townsendii*). The EYDO proposes to gate this side-passage so that it can be closed to protect maternity colonies. This side-passage gate would be secured year-round and no permits would be issued as this portion of the cave would be closed for recreational use. Both cave gates would be designed as bat-friendly to allow for the safe passage of bats.

Rose Guano Bat Cave

Rose Guano Bat Cave has a natural opening, which allows the large population of Brazilian free-tailed bats to use the cave. The cave was mined for guano starting in 1913. A 200-foot adit (a tunnel used for mining) was tunneled into the lower portion of the cave in 1926 to provide easier access to the guano. Mining permits were issued from 1928-37 and 1945-50. The most recent permit for the cave was issued in 1986. The adit allowed for air flow through the cave which made the temperature fluctuate outside of the bats' preferred range. The adit was permanently closed with a steel door in 1996 to reestablish the proper environment for the bats. The door will remain in place and maintained on an annual basis.

This Plan proposes to implement a year-round closure to protect significant bat use and visitors due to safety concerns (i.e., histoplasmosis). An interpretive sign is being developed and will be placed near the entrance of the cave interpreting the history of the cave, bat use, safety issues, and closure information (also see Interpretation and Education Section 3.7 and Safety Section 3.6).

3.5.4 Cave Trails

The development of cave trails within caves may be used to protect fragile cave resources by providing an identifiable path or previously disturbed trail to guide cavers. Cave trails can be used to restrict damage to pristine floor surfaces or fragile non-renewable deposits. The purpose of developing designated trails would be to direct users around by skirting fragile formations or archaeological sites. Using the trail to guide people to an interesting feature and establishing a clearly defined boundary can allow people to view the feature without damaging it. Cave trails would be visible and easy to follow. The following methods could be used to identify a cave trail: reflective markers, polypropylene rope, or in appropriate circumstances, flagging tape.

Cave trails in wild caves are fairly rare, but in certain circumstances the EYDO would designate trails to protect the cave's resources. Trails may be most appropriate within gated caves, where a trail could be established to avoid the following resources. Triggers for establishing cave trails include:

- Presence of highly fragile formations.
- Presence of significant archaeological or paleontological resources.

3.5.4.1 Site Specific Action

Queen of Sheba currently has an established cave trail. It would be maintained, and required that those authorized to enter the cave would follow the trail.

3.6 SAFETY

Visitor safety is a primary concern with any recreational activity taking place on public lands. As with any activity, there are certain risks involved with caving. Caves are natural features,

which inherently pose potential dangers to those who chose to visit them. To have the safest and most enjoyable caving experience possible, the visiting public needs to be informed of the hazards of caves and caving, and know what is recommended to protect themselves and other members of their party. The following are guidelines to be used when traveling through caves on the District. For additional information on safety standards and protocols, see Appendix 8.

Carry Appropriate Equipment: To have a safe and enjoyable caving trip, one should bring the appropriate equipment. This includes: a minimum of three reliable light sources, extra batteries, a helmet, gloves, non-marking sturdy boots, enough layers to keep warm, vertical gear (when necessary) and the knowledge and training for its proper use, a first aid kit, container for waste, and enough food and water to last longer than the trip's expected duration.

Group Size: For all caves on the District, the minimum number per group is recommended to be three persons to ensure visitor safety (e.g., if someone is injured, one person can stay with the victim while the other goes for help). A group of one or two greatly reduces the ability for cavers to deal with emergency circumstance, therefore, it is never recommended to cave alone.

Darkness: To avoid stressful and unsafe situations, always carry enough light (and batteries) to last longer than the trip's expected duration.

Getting Lost: Some cave passages involve a multitude of junctions and possible travel routes. In such situations, it is best to always have a member of the caving party who is familiar with the cave and to devise memory methods for retracing your steps. If lost, it is best to remain in one place. If this is not possible, carry a watch and paper and leave notes with the time as you travel; this will be of great assistance in helping searchers know where you have been and when you were last there.

Getting Stuck: In most cases, an individual can get out of any passage that they can get into. Problems occur when gravity or apprehension become a factor in the situation. Calming the person down and/or removing some of their clothing can alleviate most situations. When in doubt, do not try to squeeze through a tight hole.

Hypothermia: One of the most noticeable conditions upon entering a cave is the change in temperature. This temperature, combined with air movement and dampness, provides a perfect set-up for hypothermia. Hypothermia can become a problem when water is encountered, exposure to severe cold, or when the group moves too slowly. Proper gear, such as diving wetsuits, polypropylene pile suits, or waterproof dry suits, are needed for wet caves, even in warm climates.

Histoplasmosis: Histoplasmosis is an infection caused by breathing in spores of a fungus (*Histoplasma capsulatum*) found in bat guano. Histoplasmosis is most commonly transmitted when these spores become airborne. Soil contaminated by bat guano can also transmit histoplasmosis. A dust mask or a respirator with a high-efficiency particulate air filter may be

needed when traveling over excessive amounts of bat guano, such as that found in Rose Guano Bat Cave.

Cave-Specific Hazards: Hazards in specific caves would be noted in cave inventory files and updated as necessary.

Hazardous Gases: CO₂, methane, and other life-threatening gases are known to be present in caves. If a problem is identified in a cave on the District, air quality monitoring would be conducted by the EYDO.

Abandoned Property: Any human effects left from recreational caving and climbing (i.e., ropes, ladders, and temporary devices) would be considered abandoned property and would be removed (43 CFR 8365.1-2(b)). Items would be retained at the EYDO for 30 days. After 30 days, the EYDO will dispose of any retained items. This would assist in resource protection and provide for public safety.

See Interpretation and Education (Section 3.7) on how the EYDO plans to share information regarding safety concerns with the public.

3.6.1 Search and Rescue (SAR) Procedure

Caves present an unusual situation for providing emergency services. Darkness, tight crawl spaces, and sharp drop-offs all hamper rescue efforts. Per BLM Manual 1112-2, Local and State authorities have the primary responsibility for locating persons lost on public lands. Bureau personnel are authorized to assist them in searching for persons lost on or near public lands. The extent of such assistance depends upon local agency capabilities, BLM training and equipment, and the nature of the emergency.

EYDO personnel responsible for cave management can provide valuable knowledge of cave location and layout, and resource concerns. Cave management personnel may be able to provide familiarization of SAR techniques, equipment, manpower, and resource concerns. Recreational cavers that have extensive experience with caves are also an important resource. They often know specifics of the caves, and other caves in the area that are relevant to a search effort. Great Basin National Park maintains a list of contacts for cave search and rescue. This list is revised as needed; the most current list would be provided to the EYDO dispatch personnel when the need for specially trained cave rescue personnel is required.

The EYDO cave management staff would maintain an informational packet for the most highly visited caves on the District for SAR operations. The packet contains: directions to the caves, maps of the caves, the cave's length, known hazards, and resource difficulties (e.g., extremely small passages, water obstacles, sensitive resources, or deep pits). At a minimum, dispatch and law enforcement officers would receive a copy when the packet is updated. The packet may be provided to Ely Management Team representatives, as requested.

The EYDO may seek to enter into a Memorandum of Agreement with the local County Sheriff's Offices for cave search and rescue operations. Cave locations are safeguarded under the confidentiality provision of the FCRPA, information about caves would only be given out on a case-by-case emergency basis with authorization from the Authorized Officer. County Sheriff's Offices would be required to notify the BLM within 30 days following any search and rescue operation in caves on BLM managed lands.

3.7 INTERPRETATION AND EDUCATION

Cave interpretation and public education are essential elements of an active and progressive cave management program. Educating the public on the importance of responsible caving leads to preservation of cave resources, which is an integral part of protecting these fragile resources for current and future generations. Education will help increase awareness and understanding of cave ecosystems while fostering an appreciation of cave resources.

3.7.1 Interpretive Signs

Caves containing fragile or sensitive resources or hazardous conditions would be adequately signed. For intensively managed caves, an identification sign indicating the managing agency, the requirements for entry and the address where authorization can be obtained will be located at the cave. Where there is a need to publicize the sensitivity of a particular cave resource or potential safety hazards, signs will be placed outside the cave to forewarn or educate the visiting cavers. Such signage would be kept to a minimum to prevent undue degradation of a desired wild caving experience, yet adequate enough to effectively manage the identified cave.

Interpretive signs could be installed just outside the entrances to assist in environmental education about the cave resources. These signs would be designed and placed such that they convey needed information in a format which is not visually intrusive. Cave maps would not be provided on signs or kiosks.

Three of the caves (Goshute, Whipple, and Leviathan) have interpretive signs installed at the trailheads for each of the caves.

3.7.1.1 Site Specific Actions

Cave Valley Cave

An interpretive and informational kiosk would be designed and installed near the entrance to Cave Valley Cave. Topics for the sign include: closure information, bat use, historical significance, cave ecology, and WNS decontamination information. Since this cave has a history of vandalism, *Leave No Trace* caving principles specific to caving would benefit this cave.

Goshute Cave

As funding allows, the Goshute Cave sign would be revised and updated.

Rose Guano Bat Cave

An interpretive and informational kiosk is being developed and will be placed near the entrance of the cave interpreting the history of the cave, bat use, safety issues, and closure information.

3.7.2 Educational Brochures

The EYDO would develop a caving brochure, including topics such as: the importance of caves, *Leave No Trace* caving principles, safety concerns, WNS (risks, impacts, transmission and prevention), and bats. This information would be available at both offices within the EYDO, as well as in cave registers. Brochures would help make the community and other visitors aware of safe caving techniques and the fragile nature of cave resources. Additionally, guidelines on Caving Principles are outlined in Appendix 9 and will assist EYDO personnel in educating themselves and the public on proper caving etiquette.

3.7.3 Displays

Temporary displays or exhibits describing cave resources could be prepared for public viewing. Portable displays would be designed for ease of transport and assembly and would be used at various local, regional, and national functions (e.g., NSS Convention) where the EYDO would like to advertise its cave management program and highlight recreational caving within the District.

3.7.4 Cave Programs

Demand for caving opportunities is expected to continue to increase, making it essential to inform the general public, special interest groups, and professional organizations on responsible and safe caving ethics. Cave programs would be developed to foster cave conservation and awareness in the community, as funding and time are available. These programs could target service organizations, schools, and other interested groups or individuals, including first time cavers. Programs would also focus on cave safety, cave ethics and conservation, cave geology, and animals that inhabit caves. The EYDO would work closely with other agencies, organizations, and individuals in developing these programs. The development of a cave educational program could reduce SAR operations and restoration projects by encouraging the principles described in Appendix 9.

3.8 RESTORATION

Every entry into a cave, by any person, creates disturbance. The cumulative impact of even slight changes and disturbances can lead to dramatic alterations of the cave environment and recreational enjoyment. In some cases, impacts to the cave environment are profuse enough to warrant restoration actions. Prior to any restoration actions taking place, cultural and biological significances would be determined.

Cultural Concerns

Caves often contain prehistoric rock art, historic inscriptions, and/or artifacts of historic or prehistoric significance. To ensure these fragile resources are preserved, they would not be removed from their original context unless the following conditions are met:

- Compliance with Title 54 U.S.C. §300101, et. seq., commonly known as the National Historic Preservation Act of 1966, as amended (NHPA), and Title 54 U.S.C. §306108, commonly known as Section 106 of the NHPA (Section 106).
- Curation plan to house artifacts in perpetuity at a Federally Approved Repository in accordance with the Antiquities Act of 1906.
- Tribal consultation and the State Historical Preservation Office (SHPO) consultation and concurrence regarding curation plan in accordance with the NHPA and the State Protocol Agreement.
- In the event that graffiti removal would take place, an archaeologist who meets the Secretary of the Interior's qualifications for a professional archaeologist, would perform an assessment of the removal area to ensure that no cultural properties would be affected.
- All actions which may affect access to caves must be in compliance with Executive Order 13007: Indian Sacred Sites.
- Markings deemed historically or culturally significant would remain as they are and would not be removed, touched, or damaged in any way.

Biological Concerns

The section of the cave that is proposed to be worked on would be evaluated to determine if it is used by bats or other sensitive fauna. Precautions would be taken to protect bat hibernacula, nurseries, and roosts. Projects in roosting areas would be accomplished while the bats are not present.

3.8.1 Types of Vandalism

Many of the caves on the District are subjected to various degrees of vandalism. Vandalism takes the form of intentional and unintentional disturbances. Intentional disturbances may include graffiti, trash dumping, breaking or damaging speleothems, and polluting the aquatic and microbial environment. Unintentional disturbance may occur from noisy groups or careless tracking of mud and dust onto flowstone or other cave formations. If any new vandalism is documented within caves on the District, the EYDO will seek to identify the violator(s) and they will be prosecuted and held responsible for damages (16 USC Sec. 4301 Title 16 Chapter 63 Section 7. Prohibited Acts and Criminal Penalties, and Section 8. Civil Penalties). For significant caves, FCRPA identifies additional civil penalties that may be implemented. According to Section 7(a) of FCRPA, “Any person who...knowingly destroys, disturbs, defaces, mars, alters, removes or harms any significant cave...shall be punished in accordance with subsection (b).”

Graffiti: Graffiti comes in all shapes and sizes and in a variety of media. Some of the most common forms of cave markings include incised or etched material, torch mark, candle smoked carbon, carbide soot, pencil, paint applied by hand, and spray paint (Goodbar and Hildreath-Wreker, 2006). Restoration techniques for removing graffiti depends on the type of media.

Litter: Litter would periodically be removed from caves. Extreme caution would be taken to not remove items which might have biological, historical, or prehistoric significance. In the event of a questionable item, a qualified archeologist would be consulted.

Broken speleothems: The EYDO would try to repair broken formations, if possible, using a support pin and epoxy. Destroying or removing any broken formations in any cave on the District is strictly prohibited.

Dirty Formations: Mud or dust tracked over clean cave formations would be cleaned off when it can be done without damaging the formations. Frequently, a soft dry brush will remove mud or dust, or it can be removed with chloride-free water.

3.8.2 Restoration Actions

Restoration actions could include the removal of non-historic graffiti, trash, and other pollutants which detract from or alter the natural cave environment. Boot scuff marks, mud, and dust deposits resulting from visitor use would be cleaned from cave formations. Each cave environment is unique and disturbance takes many forms, therefore restoration methods need to be catered to specific cases.

The ability to conduct restoration actions would be affected by several things, including funding, time, and personnel. Care would be taken in any restoration action not to introduce foreign substances, which may be more detrimental to the cave system than the original problem being corrected (e.g., using chloride-free water, not tap water). Care would also be taken when removing old pieces of wood or other substances which might contain biologic evidence. Removal of any wood debris (e.g., wood) should be undertaken over a period of time in order for the cave flora and fauna to adjust to the change in the environment.

Low-impact removal techniques may mitigate the impacts of graffiti. Common tools used for cave restoration projects include nylon or stainless steel scrub brushes and water sprayers. If deemed necessary and appropriate, high-impact removal techniques such as: rotary brushes, portable grinders, and sanders, or sand-blasting equipment may be used; however, rotary brushes or sanders typically remove more rock or flowstone and tend to scatter paint flakes and bristles over a larger area. These high-impact removal techniques may require site-specific NEPA (e.g., within wilderness).

When water is necessary for cave restoration, clean chloride-free water is best because it is usually not detrimental to cave biota and does not harm speleothems (Goodbar and Hildreath-Wreker, 2006). Water found in caves is vital to cave biota, speleothem development, and a

cave's self-cleaning processes; therefore, care would be taken during cleaning projects to prevent mud from contaminating cave pools. Improperly planned restoration projects can be extremely detrimental to cave resources. Chemicals and materials that could be harmful to cave life or speleothems would be avoided for use in restoration work.

Restoration work in caves on the District would be scheduled and supervised by the EYDO. Direct and indirect effects of all restoration techniques would be carefully monitored and documented with before-and-after photography to help ensure protection of the cave environment. Restoration projects would be documented and placed in the EYDO's cave inventory file system. Upon cultural compliance and biological review, as described above, the low-impact removal techniques may be implemented. For all other restoration techniques (e.g., rotary brush, grinders, or sand-blasting), site-specific NEPA analysis would be required.

3.8.3 Site Specific Actions

Goshute Cave

A restoration project is recommended to be completed within Goshute Cave to remove the dust off the impacted formations and graffiti found throughout the cave. This would be implemented using brushes and chloride-free water to clean the formations (i.e., no motorized/mechanized equipment).

Cave Valley Cave

Within one year from the completion of this Plan, a restoration project is proposed to remove portions of the graffiti found in Cave Valley Cave to help restore the cave's natural and historic integrity. The project would use sandblasting equipment, powered by a generator, in addition to the basic restoration tools listed above. To avoid any disturbance to bats, this restoration project would occur when the bats are not present.

3.9 CAVE RESEARCH AND COLLECTION

The BLM recognizes the value of having scientific research conducted within caves and in areas containing karst landforms on EYDO managed public lands. Information gained through research not only contributes to the general knowledge of caves, but ensures that responsible management of these non-renewable resources is informed, appropriate, balanced, and science-based. Scientific research conducted in caves is in the public's interest both for the advancement of science and as a conservation management tool.

Research projects would be permitted on a case-by-case basis. Research activities may require sampling of representative materials and/or disturbances of life forms occupying caves. Responsible sampling of one resource, even using the best techniques, has the potential to impact other resources. Archaeological and paleontological resources are particularly susceptible to physical damage or disruption of their contextual character, severely reducing their value for future research. Scientific research can damage or destroy invaluable and irreplaceable scientific

resources by simply traveling through a sensitive area. Projects for different scientific fields of study would be given equal consideration and weight, and no single field of study should have exclusive priority in cave management and access. Repetitive projects which duplicate previous research and which are consumptive, will be determined on a case-by-case basis.

It is the responsibility of the BLM, as the steward of these public resources, to use the most current best management practices in overseeing any research activities in caves on the District. Cave research activities must minimize impacts to targeted resources, and collateral damage to non-target resources. The potential value of knowledge to be gained from a given research effort will be reviewed by the EYDO and balanced against known or potential impacts to cave resources that may result from the proposed research activity. All cave research projects will be submitted as written proposals and be presented at field office scoping meetings for interdisciplinary team review and Authorized Officer approval (see Appendix 10 for Cave Research Guidelines). Depending on the specific proposal parameters and site, a site-specific NEPA analysis may be required.

The EYDO will require permits for any research activities that involve collection of cave resources or when studies are proposed that could adversely impact cave resources (see Appendix 11 for Collection Permit). Research permits which authorize collections will be issued only when it has been determined that the proposal will not create long-term, adverse impacts to cave resources. The EYDO will not authorize permits for projects that do not generate new contributions of scientific knowledge or improve the understanding of caves on the District. Because of the non-renewable nature of caves, consumptive sampling, especially of speleothems, must be strictly limited to the minimum necessary for meeting the objectives of the approved research or other scientific activity. All research permits will be issued with the provision that a copy of the study results is provided to the EYDO within 30 days upon completion of the project. Progress reports may be required for long-term research projects. All research permits shall require assurance from the permittee that significant cave locations will remain confidential, or in highly sensitive situations, a Non-Disclosure Agreement.

For caves in designated wilderness, proposals must contribute to the enhancement of wilderness character or the improvement of wilderness management. Research proposals that do not contribute to the improved management of the area as wilderness will not be permitted if they can be accomplished outside of wilderness and/or cannot be conducted in a manner compatible with the preservation of the wilderness environment.

3.10 CAVE EXPLORATION

The goal of cave exploration is to learn about and better understand the extent of cave resources. When new caves or passages are discovered, new information contributes to the understanding of cave systems and the discovery of new cave resources (e.g., biota).

Alterations to cave resources such as digging, moving rocks or enlarging passages to allow explorations, and the removal of natural components of the cave, will not be allowed without prior approval by the EYDO. The proposal would include the location, nature, and duration of the proposed exploration (see Appendix 12 for Guidelines for Cave Digging Projects). If the effects of excavation can be mitigated, or if there are no expected impacts, a permit for the exploration may be approved. Impacts to the cave environment, potential for new discoveries, and safety will be considered prior to issuing a permit to dig. In addition, all appropriate archaeological, paleontological, biological studies, and all required NEPA analysis and documentation must be completed. Photo documentation of new discoveries and digging would be required. Information on specific cave locations will be safeguarded under the confidentiality provision of the FCRPA. For caves in designated wilderness or WSAs, any alteration to the cave's resources (e.g., digging or surface disturbance) will be prohibited.

If Human Remains or Cultural Objects are Found during Exploration or Digging

Caves are the traditional internment location for many historic and prehistoric Native American cultures within the District. Human remains that are not affiliated with Native American cultures may also be found in caves. If human remains are discovered, Section VI. B and C of the Nevada State Protocol Agreement for Unanticipated Discoveries and Human Remains, will be implemented. If Native American human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during an undertaking involving BLM-managed lands, BLM will comply with Native American Graves Protection and Repatriation Act (NAGPRA) and its implementing regulations at 43 CFR § 10, Subpart B. Human remains and associated grave goods discovered on private land will be handled according to the provisions of Nevada Revised Statutes 383.

NAGPRA requires that if inadvertent discovery of Native American Remains or objects occurs, activity must cease within 100 meters of the area of discovery, a reasonable effort made to protect the item(s) discovered, and immediate notice made to the BLM Authorized Officer. BLM will notify the proponent, tribes, and consulting parties as appropriate, of BLM's decision on eligibility and proposed treatment, if any, and solicit comments on BLM's proposed course of action.

3.11 PARTNERSHIPS AND VOLUNTEERS

One of the primary purposes of the FCRPA is to foster increased cooperation with those who use caves for scientific, educational, or recreational purposes. The EYDO has a lengthy history of partnerships with local and surrounding Grottos and the Cave Research Foundation to meet management goals. The EYDO places a high priority on continuing existing partnerships for cave management and building new partnerships and agreements with Federal, State, and private partners as appropriate. This will be accomplished through the use of Memorandum of Understanding (MOUs), Challenge Cost Share Agreements, Volunteer Agreements, Cooperative

Management Agreements, Cooperative Agreements, and other actions consistent with the laws, regulations, and policy concerning cave resources. In some cases, partners have provided cave location information to the BLM. This information will be safeguarded under the confidentiality provision of the FCRPA. Partners may be provided with cave location information for specific cave management projects. This information would be made available only under the conditions that such information will be kept confidential within the framework of the partnership agreement.

The EYDO would seek participation from interested individuals and organizations, such as Grottos, scientists, recreationists, and others with interests in managing, preserving and restoring cave resources. The EYDO would maintain a current mailing list of interested parties regarding cave management. The mailing list would be utilized to announce present and future resource activities near and within caves on the District.

3.12 WHITE-NOSE SYNDROME

3.12.1 Background

WNS is an emerging fungal disease of hibernating North American bat species. First documented in New York in the winter of 2006-2007, WNS has spread rapidly across the eastern and Midwestern United States and eastern Canada. As of 2015, WNS has been confirmed in 26 states and five Canadian provinces (U.S. Fish and Wildlife Service, 2015).

Appeared to have originated in Europe, WNS has killed nearly 6 million bats in North America since its introduction. WNS thrives in low temperatures (5-20° C; 40-68° F) and high levels of humidity (> 90%) (U.S. Fish and Wildlife Service, 2011). Cave and abandoned mine hibernating bats are especially vulnerable because caves and underground mines provide the cool, moist conditions favorable for the fungus to thrive.

More than half of the 47 bat species living in the United States hibernate to survive the winter. Seven cave-hibernating bats, including two endangered species and one species recently proposed for listing, are confirmed to have WNS (U.S. Fish and Wildlife Service, 2015). An additional five bat species have tested positive for *Pseudogymnascus destructans* (Pd), but no diagnostic sign of WNS has been documented (U.S. Fish and Wildlife Service, 2015).

The disease is named for the white fungus, formerly known as *Geomyces destructans*, which infects skin of the muzzle, ears, and wings of hibernating bats (Klein, 2009). WNS can also cause severe tissue damage on the wings of the bats adding to the mortality aspect of infected bats (Reichard and Kunz, 2009). Bats with WNS act strangely during cold winter months, including flying outside during the day and clustering near the entrances of caves and other hibernation areas. Bats have been found sick and dying in unprecedented numbers in and around caves and mines. In some areas, 90 to 100 percent of the bat populations have died (U.S. Fish and Wildlife Service, 2015). WNS has not been shown to infect other wildlife, domestic animals species, or humans.

3.12.2 Bats of NV on the District

Although WNS has not yet been observed in Nevada, two of the bats species confirmed with WNS and one positive for Pd are also species found on the District. These species include the big brown bat, little brown bat, and the silver-haired bat. Since little brown bats and four other *Myotis* species have been heavily impacted by WNS in the eastern U.S., the belief is that other *Myotis* species could be susceptible to Pd, including eight species of *Myotis* found in caves on the District. In addition to the *Myotis* species, there may be higher risk of WNS or Pd affecting the pallid bat and Townsend's big-eared bat, which are found on the District (Williams, 2015).

3.12.3 Monitoring for WNS

Monitoring of bat populations that are currently unaffected by WNS is critical, both for early identification of the disease and collection of pre-WNS baseline information. In conjunction with NDOW, the EYDO has been collecting bat guano and soil samples in caves since 2012 to monitor the presence of WNS. Since 2013, humidity and temperature sensors have been installed in five caves to measure climatic changes within the cave and to better understand the likelihood of WNS arriving in Nevada. Baseline data on temperature and humidity in caves on the District will help determine the climatic range in which Pd can thrive.

Additionally, NDOW has been following United States Geological Survey-National Wildlife Health Center protocol for non-lethal swab sampling of bat skin for detection of Pd. This process involves taking 25 swab samples per site. Data being collected will assist with knowledge of bat use of caves on the District and will help monitor the presence of WNS.

3.12.4 WNS Response

To date, no vaccine, treatment, or other measure for directly controlling or eliminating WNS in natural settings has been reported. Consequently, the best short-term approach for controlling Pd is to limit the spread of the fungus. Scientific data collected to date indicates that transmission of WNS is occurring bat-to-bat and cave/mine-to-bat. Scientists also suspect transmission of WNS may be facilitated by human activity in caves where bats hibernate, because of the geographically discontinuous spread of the syndrome. People may be inadvertently transporting fungal spores from cave to cave, as fungal spores have been detected on gear exposed to affected sites. EYDO strategic planning would facilitate management responses, increase public and agency awareness, and attempt to minimize the risk of the spread of Pd via human activities in caves on the District. One method to prevent human related spread of Pd is through decontamination of clothing and gear worn by persons entering caves and mines.

On August 19, 2010, the BLM released the national White-Nose Syndrome Interim Response Strategy (see Appendix 7). The strategy directs BLM offices to conduct outreach, emphasize ongoing inventory efforts, consider restricting access to caves and abandoned mines, implement containment and decontamination procedures, participate in interagency groups, and recommend monitoring sites.

While WNS is not in Nevada yet, the EYDO recognizes the threat of WNS expanding into the Western U.S. If WNS reaches the District, the most current policy regarding WNS will be followed. In the interim, adherence to BLM Containment and Decontamination Procedures (see Appendix 7) to prevent the spread of the disease by humans is required for all employees, volunteers, and public entry. Caving gear and clothing used in caves from states or other countries where Pd/WNS has been documented is strongly discouraged. If bringing caving gear from states or countries where Pd/WNS has been documented, it must be decontaminated in accordance with the BLM Containment and Decontamination Procedures.

There are several approaches available which will reduce the amount of gear that needs to be disinfected. They are as follows:

- Reduce the amount of gear being taken into the cave/field to that needed for safe and effective work.
- Gear not used during a cave trip can be bagged in sealed plastic bags. If the bags are not opened in the cave, the gear will not require disinfection. However, the bags themselves are considered contaminated and will require disposal or disinfection.
- Clothing covering, such as disposable rubber booties and disposable coveralls (made of Tyvek or similar fabrics), may be used to reduce the risk of contamination of clothing and footwear (and thus also the need for disinfection). However, it is important to be sure coverings do not tear or otherwise allow clothing to be exposed to cave sediment. Also, boot coverings can affect footing and will be only used when it is clear that they will not compromise safety.
- Specific gear could be dedicated for use in only one cave or cave area.
- In some cases disposable gear (such as latex or rubber gloves for handling bats) provides a preferable alternative to disinfection.
- The use of rubber boots may expedite disinfection of footwear.

3.12.5 Emerging Diseases or Crises

In the case of any emerging disease or crisis, the EYDO will take the appropriate actions to ensure the disease or crisis is not spread throughout caves on the District.

3.13 SPECIAL DESIGNATIONS

Several caves occur within areas that have been designated Wilderness, WSAs, or an ACEC. Caves within these special designations would be subject to specific restrictions provided by the particular designation.

3.13.1 Wilderness & Wilderness Study Areas

Several caves occur within designated wilderness, including three of the most popular caves: Leviathan Cave, Whipple Cave, and Goshute Cave. Smaller caves and alcoves lie within designated wilderness/WSAs, as well as the potential for undiscovered cave resources.

Within designated wilderness, recreation and projects (e.g., restoration or research) must be conducted without use of motorized equipment or construction of temporary or permanent structures. Exceptions may be approved for projects that are essential to managing the specific wilderness area when no other feasible alternatives exist. Such use must be necessary to meet the minimum requirements for administration of the area as wilderness and must not degrade wilderness character. A site-specific NEPA analysis, and Minimum Requirements Analysis, would be needed for any project which proposed a prohibited use.

Recreational caving would continue as long as there are no irreversible impacts to cave resources and wilderness/WSAs. The use of natural anchors for rigging ropes would be used when possible. Temporary anchoring devices such as nuts, cams, and slings would be allowed. The use of permanent fixed anchors, such as bolts and pitons, would be allowed to reduce impacts to vegetation or soils or to improve the caver safety. Cavers or climbers may use hand-powered drills to place permanent fixed anchors but power drills may not be used to place permanent fixed anchors in non-emergency situations (WO-IM-2007-084). Damaging practices, including chiseling or chipping rock, forcibly prying off rock, gluing or otherwise affixing artificial holds on rock and destroying vegetation to enhance a vertical route would be prohibited.

3.13.2 Areas of Critical Environmental Concern

ACECs are areas within public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards (BLM Manual 1613) ACECs are designated through the BLM's Land Use Planning Process.

The RMP designated Rose Guano Bat Cave and Snake Creek Indian Burial Cave as ACECs. Both caves were designated as ACECs due to the high archaeological values. The objective as laid out in the RMP for the ACECs is to ensure that multiple-use activities within the planning areas are consistent with the management plans developed for special designation areas such as ACECs. These caves will be monitored annually to determine if the resource values, for which the area was designated, are stable. The RMP directs the EYDO to develop site-specific management plans for ACECs. Those plans, when developed, would address the resources found within the caves beyond what is discussed here.

3.13.2.1 Site Specific Action

Due to high cultural sensitivity, the Snake Creek Indian Burial Cave will be closed to recreational use. Native American Tribes would be allowed to access this gated cave when requested.

See Cave Gates and Cave Closures (Section 3.5.3) for the year-round closure of Rose Guano Bat Cave.

PART 2: ENVIRONMENTAL ASSESSMENT

Ely District Cave Management Plan

DOI-BLM-NV-L000-2015-0001-EA



CHAPTER 1: INTRODUCTION AND BACKGROUND

1.1 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the Bureau of Land Management (BLM), Ely District Office (EYDO) Cave Management Plan (Plan) is to provide guidance for cave management and provide for recreation within caves across the Ely District (District), while ensuring protection of cave resources. This Plan, which is also the proposed action, would establish direction for long-term management, planning, and oversight of the cave resources and identify specific management actions for recreational use, scientific research, and the overall management of cave resources.

The Plan is needed to establish district policy for multiple-use management practices regarding caves and cave-related resources. Cave resource management is necessary to ensure long-term protection and conservation of these fragile resources while accommodating uses such as scientific research and discovery as well as quality recreational caving experiences.

1.2 CONFORMANCE

1.2.1 Compliance with Existing Laws and Regulations:

The following laws, manuals, and handbooks direct Federal agencies to secure, protect, and preserve significant caves and the resources contained therein, while managing them for the perpetual use, enjoyment, and benefit of all for generations to come.

- Antiquities Act of 1906, Public Law (P.L.) 59-209 34 Stat. 225 (16 United States Code (U.S.C.) §§ 431- 433).
- Wilderness Act of 1964, P.L. 88-577 (16 U.S. C. §§ 1131-1136, September 3, 1964, as amended 1978).
- Title 54 U.S.C. §300101, et. seq., commonly known as the National Historic Preservation Act of 1966, as amended (NHPA).
- National Environmental Policy Act of 1969, P.L. 91-190 (42 U.S.C. §§ 4321-4347, January 1, 1970, as amended 1975 and 1994).
- Endangered Species Act of 1973, PL 59-209 (16 U.S.C. §§ 1531-1544, December 28, 1973, as amended 1976-1982, 1984, and 1988).
- Federal Land Policy and Management Act of 1976, as amended, P.L.94-579 (43 U.S.C. §§ 1701-1782, October 21, 1976, as amended 1978, 1984, 1986, 1990-1992, 1994, and 1996).
- Clean Water Act of 1977 (33 U.S.C §§ 1251-1376).
- Archaeological Resources Protection Act of 1979, P.L. 96-95 (16 U.S.C. 470aa-mm).
- Federal Cave Resources Protection Act of 1988, P.L. 100-691 (16 U.S.C. § 4301, as amended through P.L. 106-170, 1999).
- Native American Graves Protection and Repatriation Act of 1990, P.L. 101-601 (25 U.S.C. §§ 3001-3013).

- Cave and Karst Research Institute Act of 1998, P. L. 105-325 (16 U.S.C. § 4310).
- The Lincoln County Conservation, Recreation and Development Act of 2004, P.L. 108-424.
- The White Pine County Conservation, Recreation and Development Act of 2006, P.L. 109-432.
- Omnibus Public Land Management Act of 2009, Subtitle D, Paleontological Resources Preservation Act.
- 43 CFR, Part 37—Cave Resources Management
- 43 CFR Part 6300—Management of Designated Wilderness
- 43 CFR 1610.7-2—Designation of Areas of Critical Environmental Concern
- BLM-MOU-WO-250-2007-01—Memorandum of Understanding between the Bureau of Land Management, the National Speleological Society, and the Cave Research Foundation
- BLM-WO-IM-2010-181 which includes BLM-White-Nose Syndrome Interim Response Strategy and BLM Containment and Decontamination Procedures

1.2.2 Conformance with Existing BLM Land Use Plans:

This Plan has been analyzed within the scope of the Ely District Approved Resource Management Plan (RMP) (2008) and has been found to be in conformance with the goals, objectives, and decisions of the Decision Summary and Record of Decision. Specific management actions from the RMP provide direction to meet the goals and objectives of cave resource management:

1. *Recreation: REC-1:* Manage for the protection of cave resources in the planning area according to the Ely District Office Cave Management Plan.
2. *Livestock Grazing: LG-2:* The following public lands are unavailable for livestock grazing (see Map 19): Snake Creek Indian Burial Cave Areas of Critical Environmental Concern (ACEC) (40 acres); SS-7
3. *Special Designations: SD-8:* Designate the following 7 areas as ACECs (see Management Actions SD-3) - two of which are Archaeological Sites- Rose Guano Bat Cave and Snake Creek Indian Burial Cave.

1.2.3 Consistency with BLM Policy Manuals and Handbooks:

- BLM Manual 8380—Cave and Karst Resources Management
- BLM Manual 1613—Areas of Critical Environmental Concern
- BLM Manual 6330—Management of Wilderness Study Areas
- BLM Manual 6340— Management of Designated Wilderness Areas
- BLM Manual 6840—Special Status Species Management
- BLM H-1601-1—Land Use Planning Handbook
- BLM Manual Handbook 1112-1—Safety and Health Management

1.3 DECISIONS TO BE MADE

This document will affect management guidance for the BLM EYDO. This document will provide the EYDO Authorized Officer with a basis on which to make an informed decision regarding cave management and uses affecting caves. Following review of this document, the EYDO District Manager will decide to do one or more of the following:

1. Make a determination of a Finding of No Significant Impact for the Proposed Action and sign a Decision Record approving the Plan, which is the proposed action.
2. Approve management proposals as presented in one of the alternatives or a combination of alternatives analyzed in this document.
3. Defer some or all of the specific management proposals for implementation at a later date.
4. Determine that the proposed actions or certain proposed actions in this document may cause significant impacts (as defined in 40 CFR 1508.27) that will require development and approval of an environmental impact statement prior to implementation.
5. Choose to select the No Action Alternative.

1.3.1 Scoping and Alternative Development

The EYDO internally scoped this project in the Caliente, Egan, and Schell Field Offices in January 2015. The Schell Field Office is the lead office for this project. A Notice of Proposed Action in wilderness was sent to the wilderness mailing list on February 12th, 2015. The EYDO initiated public scoping with a scoping letter and news release on March 18th, 2015. Two public meetings were held on April 1st, 2015 (Caliente Field Office), and April 2nd, 2015 (Ely District Office), and two members of the public attended the meeting in Ely. Tribal consultation was initiated on July 15th, 2015.

Based on the analysis of issues raised during public and internal scoping, the EYDO Interdisciplinary Team identified the following issues:

- Restoration of Disturbed Areas— Past vandalism and use has degraded the naturalness of many of the caves. Restoration of the disturbed areas should be considered as well as ways of preventing future vandalism and impacts caused by use
- Management of BLM Special Status Species and Other Rare Cave Biota (predominately bats)— Protect caves with bat roosts and rare cave biota. Ensure bats are not disturbed during critical times (e.g., hibernation) or lost due to visitor use.
- Compatibility of Land Uses— Not all land uses are compatible with long term protection of cave resources. These non-compatible uses may include water diversion projects, exploration drilling, and mining.

- **Incomplete Resource Information**— Resource information on many caves on the District is lacking. This is especially true of the caves' biotic communities.
- **Recreational Visitor Use**— Manage recreational visitor use to minimize impacts to caves, cave formations, and cave resources.
- **Management guidelines for resolution of these issues are included in the Proposed Action.**

CHAPTER 2: DESCRIPTIONS OF ALTERNATIVES

2.1 ALTERNATIVE A – NO ACTION ALTERNATIVE

Under the No Action Alternative, cave management on the District would continue as it is presently conducted. The EYDO would rely on the current EYDO Cave Management Plan (1986) and the RMP for guidance on managing cave resources and the uses that may affect caves. Current laws would also be followed, including FCRPA. Management of caves would be reactive and sporadic. All new actions would be considered in separate documents, following the requirements of the National Environmental Policy Act (NEPA).

2.2 ALTERNATIVE B – PROPOSED ACTION

The Cave Management Plan is the Proposed Action. The following Management Actions listed in EA Table 1 are fully described in the Plan.

EA TABLE 1. SUMMARY OF THE PROPOSED ACTION

Objective	Management Action
Cave Inventory	Maintain and update the standardized cave inventory file system.
	<i>Cave Markers</i> - at a minimum, the EYDO would mark all significant caves with a monument (e.g., brass cap or project marker) at or near the entrance of the cave. Monuments would be used to map and survey caves, and incorporate them into the National Spatial Reference System.
Surface Cave Management	<i>Withdrawals</i> - protect significant caves and their immediate environs, by withdrawing the land from all forms of appropriation. Proposed withdrawals include Cave Valley Cave, Rose Guano Bat Cave, and Snake Creek Indian Burial Cave.
	<i>Land Actions</i> - Significant caves on the District would remain in public ownership. Surface or subterranean discretionary activities affecting cave resources would be analyzed for their potential impacts to cave and karst systems, including karst aquifers.
	<i>Use of Chemicals</i> - The use of fire retardants and herbicides would be carefully analyzed to avoid impacts to cave resources.
Resource Monitoring	<i>Biological Monitoring</i> - a biological inventory needs to be completed to determine the different types of cave flora and fauna present.
	<i>Photo and Impact Monitoring</i> - the EYDO would establish and maintain photo monitoring points and conduct impact monitoring at the following caves: Cave Valley Cave, Goshute Cave, Pescio Cave, Leviathan Cave, and Whipple Cave.
	<i>Bat Monitoring</i> -the EYDO would continue to assist NDOW in conducting baseline bat monitoring and surveillance.

Objective	Management Action
	<p><i>Hydrological Monitoring</i>- water samples for baseline data would be collected in caves with water sources.</p> <p>Data loggers would be installed in water sources at Forgotten Cave and Leviathan Cave.</p> <p><i>Cultural and Paleontological Monitoring</i>- sensitive resources would be monitored regularly.</p> <p><i>Cave Climate Monitoring</i>- humidity and temperature sensors would continue to be used to measure climatic changes within the cave and to better understand the likelihood of WNS arriving in Nevada.</p>
Visitor Use	<p><i>Cave registers</i> would continue to be used to provide information about cave visitation. When appropriate, data loggers would also be used to verify visitor use numbers.</p>
Visitor Use Management	<p><i>Carrying Capacity</i>- carrying capacity describes the number of visitors that the cave can support and still retain its unique qualities. A carrying capacity determination guides restrictions on cave use frequency, party size, and seasonality of use. The number of visitors allowed at any one time is recommended to be a minimum of three persons. All caves on the District would have a maximum recommended limit of eight persons per group. Whipple Cave and Cave Valley Cave are larger caves and contain fewer highly fragile formations; therefore, due to their size, and durability, these two caves will have a maximum group size limit of 12 persons.</p> <p><i>Frequency of visits</i>- setting a weekly trip limit would help protect the District’s cave resources while allowing for a “wild” experience for recreational cavers.</p> <p>Frequency of visitation is set at a maximum of one group per week for the following caves: Cave Valley Cave, Goshute Cave, Leviathan Cave, Pescio Cave, and Whipple Cave. The week timeframe is set at Monday through Sunday.</p> <p><i>Cave Use Permits</i>- permits are a frequently used tool to control visitor use within caves while protecting its resources.</p> <p>The EYDO would establish a free, but mandatory, office-issued permit system for Cave Valley Cave, Goshute Cave, and Whipple Cave. The permit system is being established to better track recreational usage while helping protect cave resources within the caves identified.</p> <p>Self-issued permit stations would be established at Pescio Cave and Leviathan Cave. Signs, permits, and permit receptacles would be erected at each trailhead. These permits would also be free, but mandatory.</p>

Objective	Management Action
	<p><i>Cave Gates</i>- cave gates are a commonly used tool for implementing cave closures or controlling visitor use. Gates may be utilized where significant resource damage has occurred, or significant safety concerns are identified.</p> <p>Goshute Cave is proposed to be gated to better control the visitation and reduce the impacts to the formation by the dust.</p> <p>This Plan proposes to gate Cave Valley Cave’s entrance to protect cultural resources within the cave. Additionally, this cave has a side-passage near the entrance, which is used by maternity colonies of Townsend’s big-eared bats (<i>Cornynorhinus townsendii</i>). The EYDO proposes to gate this side-passage so that it can be closed to protect maternity colonies. This side-passage gate would be secured year-round.</p> <p><i>Cave Closures</i>- to help resolve the conflict between recreational caving use and the safety of bat populations, seasonal cave closures may be a management tool taken by the EYDO.</p> <p>This Plan proposes to implement a year-round closure of Cave Valley Cave’s side-passage to protect the maternity colonies of Townsend’s big-eared bats.</p> <p>For Rose Guano Bat Cave, this Plan proposes to implement a year-round closure to protect significant bat use and visitors due to safety concerns (i.e., histoplasmosis).</p> <p><i>Cave Trails</i>- cave trails can be used to restrict damage to pristine floor surfaces or fragile non-renewable deposits.</p> <p>Queen of Sheba currently has a cave trail laid out. It would be maintained, and required that those authorized to enter the cave would follow the trail.</p>
Safety	<p>The BLM would coordinate with the local Search and Rescue teams. The EYDO may seek to enter into a Memorandum of Agreement with the local County Sheriff’s Offices for cave search and rescue operations.</p>
Interpretation and Education	<p>Educating the public on the importance of preserving cave resources is an integral part of protecting these fragile resources for current and future generations.</p> <p>The EYDO would develop a caving brochure, including topics such as: the importance of caves, <i>Leave No Trace</i> caving principles, safety concerns, WNS (risks, impacts, transmission, and prevention), and bats.</p> <p>An interpretive and informational kiosk would be installed near the entrance to Cave Valley Cave and Rose Guano Bat Cave.</p> <p>The Goshute Cave sign would be revised and updated.</p>

Objective	Management Action
Restoration	<p>Restoration actions would be conducted as needed, and would include the removal of non-historic graffiti, trash, and other pollutants which detract from or alter the natural cave environment. Additional site-specific NEPA may be required.</p> <p>A restoration project is recommended to be completed within Goshute Cave to remove the dust off the impacted formations and graffiti found throughout the cave. This would be implemented using brushes and water to clean the formations (i.e., no motorized/mechanized equipment) Section 4 (c) of the Wilderness Act states" ...there shall be no...use of motor vehicles, motorized equipment...." within wilderness.</p> <p>Within one year from the completion of the Plan, a restoration project is proposed to remove portions of graffiti found in Cave Valley Cave to help restore the cave's natural and historic integrity. The project would use sandblasting equipment, powered by a generator, in addition to the basic restoration tools addressed in the Plan. To avoid disturbance to bats, this project would occur when bats are not present.</p>
Cave Research and Collection	<p>The BLM recognizes the value of having scientific research conducted within caves and in areas containing karst landforms on EYDO managed public lands.</p> <p>The EYDO would require permits for any research activities that involve collection of cave resources or when studies are proposed that could adversely impact cave resources.</p>
Cave Exploration	<p>The goal of cave exploration is to learn about and better understand the extent of cave resources. Alterations to cave resources such as digging, moving rocks or enlarging passages to allow explorations, and the removal of natural components of the cave would not be allowed without prior approval by the EYDO. Additional site-specific NEPA would be required.</p>
Partnerships and Volunteers	<p>The EYDO would place a high priority on continuing existing partnerships for cave management and building new partnerships and agreements with Federal, State, and private partners as appropriate.</p>
White-Nose Syndrome	<p>If WNS reaches the District, the most current policy regarding WNS would be followed. In the interim, adherence to BLM Containment and Decontamination Procedures to prevent the spread of the disease by humans and is required for all employees, volunteers, and public entry.</p>
Special Designations	<p>Due to high cultural sensitivity, the Snake Creek Indian Burial Cave would be closed to recreational use. Native American Tribes would be allowed to access this gated cave when requested. See Cave Closures & Cave Gates action above for the year-round closure of Rose Guano Bat Cave.</p>

CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 RESOURCES/CONCERNS CONSIDERED FOR ANALYSIS

The following table identifies issues that have been evaluated for potential direct, indirect, or cumulative impacts due to implementation of the Proposed Action. Some of these items are being considered to ensure compliance with laws, Executive Orders, or regulations that impose requirements on all Federal actions. Other items are relevant to the management of public lands in general, and to the EYDO in particular. A brief rationale for either considering or not considering the issue or resource further is provided.

EA TABLE 2. RESOURCE/CONCERNS ANALYSIS

Resource/Concern	Analyzed? (Y or N)	Rationale for Dismissal from Analysis or Issues(s) Requiring Detailed Analysis
Air Resources	N	Management of subsurface cave resources would not have a measurable impact on above ground air resources. Proper cave management would be beneficial to protect unique systems found within caves but the impact to air resources would be negligible.
Water Resources	N	Cave management through the Proposed Action or No Action Alternative would not have direct or indirect impacts to water resources. Proposed monitoring actions may be able help identify future potential impacts to water resources in caves due to other activities and factors.
Soil Resources	N	Management of subsurface cave resources would not have a measurable impact on soil resources. Proper cave management would be beneficial to protect unique systems found within caves but the impact to soil resources would be negligible.
Vegetation Resources	N	Management of subsurface cave resources would not impact vegetation resources above ground. The installation of kiosks at the entrance would potentially disturb individual plants but would not have a measurable effect on vegetation resources. Restrictions on herbicide and retardant may limit applications

Resource/Concern	Analyzed? (Y or N)	Rationale for Dismissal from Analysis or Issues(s) Requiring Detailed Analysis
		surrounding a cave but the need for these treatments has yet to be determined and the potential impacts to vegetation resources would be speculative in nature.
Wetlands and Riparian Zones	N	No wetlands or riparian zones have been identified. There would not be any impacts to wetlands or riparian zones due to the Proposed Action.
Fish and Wildlife	Y	Analysis provided in Section 3.2.1.
Special Status Animal Species	Y	Analysis provided in Section 3.2.2.
Special Status Plant Species	N	There are no special status plant species that would be affected by the Proposed Action.
Wild Horses	N	The Proposed Action is within a wild horse herd management area, but it would not affect wild horses.
Cultural Resources	Y	Any restoration, maintenance, or exploration activities that are ground disturbing within and/or around a cave would require compliance with NHPA and Section 106. Analysis provided in 3.2.3.
Paleontological Resources	Y	Any restoration, maintenance, or exploration activities that are ground disturbing within and/or around a cave would require Section 106 compliance procedures and adherence to the Paleontological Resource Management BLM Manual 8270 until Federal regulations regarding paleontological resources are officially approved and implemented. Analysis provided in Section 3.2.4.

Resource/Concern	Analyzed? (Y or N)	Rationale for Dismissal from Analysis or Issues(s) Requiring Detailed Analysis
Native American Religious Concerns	N	In the event of discovery of human remains within any cave on the District, the EYDO would comply with the Native American Graves Protection and Reparation Act and would consult with Native American Tribes.
Visual Resources	N	Cave management through the Proposed Action or No Action Alternative would not have an impact on above ground visual resources. Above ground installations such as kiosks that adhere to the BLM standard environmental color chart would be a minor component on the landscape and will not have an impact on visual resources.
Lands and Realty	N	The recommendation to segregate and subsequently withdraw caves, and their immediate environments, if pursued in the future, would be analyzed under the NEPA analysis specific to that process.
Recreation	Y	Analysis provided in Section 3.2.5.
Livestock Grazing	N	The Proposed Action and No Action Alternative would not impact livestock grazing adjacent to cave entrances. Lands surrounding cave entrances would remain open to livestock grazing where visitors may encounter them. Livestock may rub on installed kiosks, monuments, etc.
Geology	Y	Analysis provided in Section 3.2.6.
Mineral Extraction	N	The Proposed Action has no immediate impact on mineral resources. If and when withdrawals from mineral entry and mineral leasing are sought, impacts to mineral resources would be analyzed in the NEPA process.

Resource/Concern	Analyzed? (Y or N)	Rationale for Dismissal from Analysis or Issues(s) Requiring Detailed Analysis
Floodplains	N	There would not be any downstream flooding affects due to the Proposed Action.
Noxious and Invasive Weeds	N	If noxious and/or invasive species issues should arise, they would be carefully analyzed to avoid any impacts to cave resources.
Wilderness and WSAs	Y	Analysis provided in Section 3.2.7.
Lands with Wilderness Characteristics	N	Some cave resources occur within areas identified as containing wilderness characteristics; however, there are no proposed actions that would impair those characteristics or eliminate the unit for further consideration as outlined in BLM Manuals 6310 and 6320. Further, there has not been a land use plan amendment to determine if or how these units would be preserved to protect the wilderness characteristics.
Special Designations other than Designated Wilderness	N	Two ACECs contain cave resources, but would not be affected by the Proposed Action.
Wastes, Hazardous, or Solid	N	No known hazardous or solid wastes nor would likelihood of them being introduced through the Proposed Action.
Environmental Justice	N	No environmental justice issues are present at or near the project.

3.2.1 Fish and Wildlife

3.2.1.1 Affected Environment

Caves on the District provide habitat for a variety of wildlife from mammals, reptiles, birds and invertebrates. Wildlife use of caves varies from only utilizing the entrance of a cave, from using a cave intermittently, or to being an obligate cave dweller. Falcons have been observed hunting bats as they fly out of caves at dusk. Mountain lions, bobcats, and ringtail cats may use caves for temporary shelter and small mammals such as deer mice and packrats are also known to live in

caves, but may venture out to forage for food. Snakes may also use caves to hunt for bats and other small mammals, or to seek shelter. Certain species of bats use caves to roost and are discussed below in the Special Status Animal Species Section (3.2.2).

Several obligate invertebrates are restricted to caves throughout their life cycle. Some of these species include aquatic amphipods, harvestmen, pseudoscorpions, and bristletails. Many of these invertebrates are unique and very rare due to the isolation, uniqueness, and harsh conditions of cave environments. Little is known about the District's cave biotic environments and numerous other invertebrates remain to be discovered. Currently, no fish species are known to inhabit any caves on the District.

3.2.1.2 Environmental Consequences

Impacts from the Proposed Action

The Proposed Action could potentially have both beneficial and negative impacts to wildlife. Restricting the number of recreationalists and frequency of visits in Goshute Cave and closing Rose Guano Cave year-round would minimize disturbance to all wildlife. This can be critical to cave dwelling invertebrates that have sensitive environmental conditions for their lifecycles.

Two caves are proposed for new gates, Goshute Cave and Cave Valley Cave. These caves would restrict use of larger mammals such as mountain lions or bobcats, but would still allow use by smaller animals that can pass through the gates. The gates are constructed to allow safe passage for bats. Bats will be fully discussed below in the Special Status Animal Species Section (3.2.2).

Cave Valley Cave restoration would temporarily disturb wildlife and may cause some to avoid the cave during restoration activities; however animals would return to utilize the cave once restoration is completed.

Impacts from the No Action Alternative

Under the No Action Alternative, human disturbance would continue to disturb wildlife utilizing the caves. This can potentially be an issue for some of the higher use caves by altering wildlife use of caves for shelter, hunting, and foraging. High visitor use could be detrimental to rare cave dwelling invertebrates that have very sensitive environmental conditions for their lifecycles.

3.2.2 Special Status Animal Species

3.2.2.1 Affected Environment

BLM Manual 6840—Special Status Species Management defines special status species as 1) species listed or proposed for listing under the Endangered Species Act (ESA), and 2) species requiring special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. All Federal candidates, proposed, and

delisted species in the 5 years following delisting would be conserved as Bureau sensitive species.

BLM 6840 Manual protocol states that BLM shall conserve sensitive species and their habitats and ensure that actions authorized, funded, or carried out do not contribute to the need to list species as threatened or endangered. This designation includes species restricted in range, which have natural or human caused threats to their survival and which could easily become endangered or extinct in a state.

Bats

Bats are ecologically and economically important because they consume vast quantities of nocturnal insects and support intricate cave ecosystems. Bats are a vital defense against many agricultural and forest insect pests (e.g., moths and beetles) and public health pests (e.g., mosquitoes). The value of pest-control services to agriculture provided by insect-eating bats in the U.S. alone, range from \$3.7 billion to a high of \$53 billion a year (Boyles et al., 2011).

Bats are also an important component of cave ecosystems, providing nutrient input in the form of guano and decomposing carcasses, which support diverse communities of invertebrates and cave adapted creatures.

Fifteen of Nevada’s twenty three bat species have been observed in caves on the District (see EA Table 3). All fifteen bat species are considered to be BLM special status species. Baseline bat monitoring and surveillance is currently being conducted by NDOW to get accurate data on the types and number of bat species present in caves on the District. Current monitoring techniques include bat counts on caves with summer roosts, maternity colonies, bachelor roosts, and hibernaculum. Information is also being conducted on which bat species are using each cave on the District.

EA TABLE 3. BAT SPECIES KNOWN TO OCCUR IN CAVES ON THE DISTRICT

Family/Species	Common Name
<i>Antrozous pallidus</i>	pallid bat
<i>Cornynorhinus townsendii</i>	Townsend's big-eared bat
<i>Eptesicus fuscus</i>	big brown bat
<i>Euderma maculatum</i>	spotted bat
<i>Lasionycteris noctivagans</i>	silver-haired bat
<i>Myotis californicus</i>	California myotis
<i>Myotis ciliolabrum</i>	western small-footed myotis
<i>Myotis evotis</i>	long-eared myotis
<i>Myotis lucifugus</i>	little brown bat
<i>Myotis thysanodes</i>	fringed myotis
<i>Myotis velifer</i>	cave myotis
<i>Myotis volans</i>	long-legged myotis
<i>Myotis yumanesnsis</i>	Yuma myotis

Family/Species	Common Name
<i>Pipistrellus hesperus</i>	western pipistrelle
<i>Tadarida brasiliensis</i>	Brazilian free-tailed bat

In 1970, Rose Guano Bat Cave was designated as Bat Cave and Guano Mine Historic Area due historic guano mining. In 2007, the RMP designated this cave as an ACEC to preserve the historical significance of the cave. This cave serves as a migratory stop-over for Brazilian free-tailed bats with an estimated population of 2 million.

3.2.2.2 Environmental Consequences

Impacts from the Proposed Action

The Proposed Action proposes a permitting system, which would manage group size and visitation frequency in the more popular caves on the District. The Proposed Action also establishes closing Rose Guano Bat Cave year-round and installing bat-friendly gates on Goshute Cave and Cave Valley Cave, including its side-passage. These actions would minimize disturbance to the bat populations during a time when then bats need to conserve energy for migration, increasing their survivorship.

There would be minimal disturbance to bats during the implementation of the Cave Valley Cave restoration project because it would occur when bat use is low. Additionally, the permitting system would require recreationalists to adhere to BLM Containment and Decontamination Procedures to prevent the spread of WNS, if this disease became an issue in Nevada.

Impacts from the No Action Alternative

Under the No Action Alternative, there would be no group size or frequency limitations, in addition to no seasonal closures or installation of bat-friendly gates. Bat colonies that roost within the more popular caves would continue to be disturbed by recreationalists. Disturbing bats increases their activity which reduces their energy stores and decreases their survivorship. Additionally, there would be no way to regulate the potential spread of WNS if it became an issue in the future.

3.2.3 Cultural Resources

3.2.3.1 Affected Environment

Very few of the caves on the District, which fall under the Plan, have been subjected to Section 106 compliance. At the time a cave is designated for treatment (e.g., restoration projects, gating, or other ground disturbing actions), the Section 106 process would be initiated for the cave and the appropriate area around the proposed treatment location.

Cave Valley Cave

Cave Valley Cave was first discovered by the Mormon White Mountain Expedition in 1869. Accounts by George Washington Bean document the cave and its exploration as well as interactions with Native Americans within the vicinity of Cave Valley Cave. Bean's documents are also the first written record of Native folklore regarding the cave. The next documented visit to the cave was by Lieutenant George Wheeler in 1869. Wheeler explored Cave Valley Cave extensively, and created the first map of the cave. Wheeler's reports also document the Native's relationship with Cave Valley Cave, providing additional accounts of the caves folklore.

Cave Valley Cave exhibits extensive evidence for historic and modern use. However, it is important to note the cave's significance to prehistoric peoples. The first Euro-American explorers of Cave Valley Cave consistently remark on the Native American folklore regarding the cave. Wheeler states in his expedition journal (1869) that the local Native Americans utilized the cave as a source of clay for pottery. Additionally, Julian Steward discusses the cave and its relation to the Daint people in *Basin-Plateau Aboriginal Sociopolitical Groups*. According to Steward, the Cave is centrally located, neighboring a Native American village, a festival site, and several areas important for resource gathering.

3.2.3.2 Environmental Consequences

Impacts from the Proposed Action

The management actions (listed above in EA Table 1), such as Visitor Use Management, Resource Monitoring, Interpretation and Education, and Restoration, would have a direct positive effect on cultural resources within caves on the District. Establishing a carrying capacity for each cave, monitoring the frequency of cave visits, and requiring permits for caves with fragile resources helps limit unauthorized use, vandalism, and destruction of any cultural resources that may be present within the caves. Additionally, cave gates offer significantly more protection to important historic properties. Resource monitoring establishes a standard for any identified historic properties within caves on the District. An established standard enables quick identification of unauthorized use, vandalism, and destruction to historic properties and facilitates the mitigation for such actions.

The implementation of cave trails, BLM approved trip leaders, and interpretation and education programs promotes an understanding of the need to protect cultural resources. These types of programs also provide an opportunity for the public to learn about the area's cultural heritage and participate as stewards of the land and its resources.

Finally, restoration work helps caves retain their archaeological integrity by maintaining the original setting, feeling, and association of eligible historic properties. Cave restoration serves to mitigate direct or indirect negative effects to historic properties by actions such as unauthorized use, vandalism, and destruction. In some cases, restoration work aids in the identification of new

historic properties; thus, ensuring the newly identified cultural resources are monitored and protected in the future.

Cave Valley Cave

Although archaeological resources are unidentified or unevaluated in most caves in the District, Cave Valley Cave has been extensively researched and recorded. Therefore, the proposed actions listed in the Plan would have more specific effects to the archaeological resources identified within Cave Valley Cave. Proposed management actions at Cave Valley Cave includes: the removal of graffiti via sandblasting, installing two gates (on the main entrance and its side-passage), and implementing an office-issued permit system to regulate and monitor cave visitation.

The sandblasting operation has an effect radius of 1-2 inches. For areas containing important historic inscriptions, the blast radius would be narrowed to 1 inch; however, a 3 inch buffer around important inscriptions is recommended. For graffiti removal within this 3 inch buffer, wire brushes or total avoidance are recommended. Inscription panels containing a high density of historic signatures would be avoided completely in an effort to preserve the panel and aid in future research.

The installation of a gate at the main entrance of the cave and at the side- passage would reduce adverse effects to archaeological resources by limiting the number of people allowed inside the cave and increasing monitoring activities at Cave Valley Cave. Additionally, an office-issued permit system increases the opportunity for education and outreach. Monitoring efforts at Cave Valley Cave would facilitate the identification and management of potential future vandalism episodes within the cave.

Impacts from No Action Alternative

No Action Alternative would continue to put cultural resources in caves at an increased risk from visitor use due to the lack of knowledge about resources in the caves that need protection.

3.2.4 Paleontological Resources

3.2.4.1 Affected Environment

Very few of the caves on the District, which fall under the Plan, have been investigated for Paleontological Resources. Currently, Federal regulation regarding paleontological resource management (PRPA Regulations) is in draft format. Until such time as this document is approved, paleontological resources will be managed in the same manner as cultural resources. The Section 106 process and the BLM Manual 8270-Paleontological Resource Management will serve to ensure the identification, monitoring, and protection of paleontological resources located within caves in the District. At the time a cave will be designated for treatment, the

Section 106 process would be initiated for the cave and the appropriate area around the treatment area.

3.2.4.2 Environmental Consequences

Impacts from the Proposed Action:

The management actions (listed above in EA Table 1), such as Visitor Use Management, Resource Monitoring, Interpretation and Education, and Restoration, would have a direct positive effect on paleontological resources within caves on the District. Establishing a carrying capacity, monitoring the frequency of cave visits, and requiring permits for caves with fragile resources helps limit unauthorized use, vandalism, and destruction of any paleontological resources that may be present within caves. Additionally, cave gates and closures offer significantly more protection to important paleontological resources. Resource monitoring establishes a standard for any identified resources within caves on the District. An established standard enables quick identification of unauthorized use, vandalism, and destruction to paleontological resources and facilitates the mitigation for such actions.

The implementation of cave trails, BLM approved trip leaders, and interpretation and education programs promotes an understanding of the need to protect paleontological resources. These types of programs also provide an opportunity for the public to learn about the area's prehistoric past and participate as stewards of the land and its resources.

Finally, cave restoration serves to mitigate direct or indirect negative effects to paleontological resources by actions such as unauthorized use, vandalism, and destruction. In some cases, restoration work aids in the identification of new paleontological resource; thus, ensuring the newly identified resources are monitored and protected in the future.

Impacts from No Action Alternative:

No Action Alternative would continue to put paleontological resources in caves at an increased risk from visitor use due to the lack of knowledge about resources in the caves that need protection.

3.2.5 Recreation

3.2.5.1 Affected Environment

There are about 40 known undeveloped caves on the District. In addition to the known caves on the District, it is believed that there are several other caves left to be discovered. Low population densities in Nevada, combined with difficult access, has left many high probability karst and cave areas unexplored.

Caves on the District range in length from less than 100 feet to over 3,000 feet. Some of the entrances are large and visible for miles while others are small and well hidden. Recreational use

within caves is limited to those who know about the caves and those who enjoy this past time. Visitation to caves on the District is from both locals as well as people coming from outside the local area. Knowledge about the location of cave resources travels through word of mouth and is promoted through special interest groups such as Grottos. Currently, cave registers show that caves on the District receive visits from multiple groups on some days, to only one or two groups per year (see EA Table 4).

EA TABLE 4. CAVE VISITATION ESTIMATES

Cave	Average Annual Use	Average Number of Groups/Year	Average Group Size	Data Averaged from (years)
Cave Valley	80.25	18.75	4.08	2000-2006, 2014
Goshute	170.5	39.3	4.32	2009-2014
Leviathan	29.5	7.8	3.85	2000-2014
Pescio	No data. Register installed in 2015.			
Whipple	141	23.25	6.21	2011-2014

Data in EA Table 4 is taken from voluntary visitor use registers placed inside the cave entrances. Data uses the most recent data available or averages over several years.

3.2.5.2 Environmental Consequences

Impacts from Proposed Action

The Proposed Action proposes direct impacts to recreational use of caves through group size limits, the frequency of visits, and seasonal closures. Group size limits would be in effect for all of the caves on the District and these limitations would be further enforced through a permit system on five caves. All but two caves would have a group size limit of 8 persons with Cave Valley Cave and Whipple Cave having group size limits of 12 persons. The group size limits is anticipated to have a minimal impact to recreation within the caves. According to register data, very few groups exceed the group size limitations. Groups that exceed the group size limit may still receive a cave use permit if they meet certain criteria to prevent larger groups from impacting cave resources.

Accuracy of register data is difficult to determine due to the voluntary nature of compliance as well as the possibility for vandalism. Studies have concluded a wide range of compliance with the register sign-in method. For the purpose of this analysis, it will be assumed that there is a 60 percent compliance with the register data. Future monitoring of visitor use through visitor counters and comparing the data to registers would be used to verify this assumption, determine compliance with management actions prescribed herein and determine the need, or lack thereof, for additional management actions.

There is also a recommended minimum group size limit of three persons proposed. This limit is recommended for safety reasons in the event of an emergency there would be one individual to go for help and one individual to stay with the victim. Register data indicates that there are several groups of two or less that have visited the caves, but this is difficult to confirm because of the nature of register data. Public education in regards to cave safety would improve visitor experience and help mitigate medical emergencies.

Restrictions on visitor frequency would potentially reduce the number of recreational opportunities per year, however it is difficult to quantify. Average data based on the cave registers indicates that the visitation frequency for the caves monitored is well below the total number of people allowed as well as the amount of visits allowed within any given year (see EA Table 3). Visitation to the caves increases during the summer months. This increase may create conflicts with prospective cavers desiring to visit the caves during the same week, with the proposed frequency limitations. Displaced recreationists may shift their use to other caves that would not be subject to the permit system. This increased use may lead to undesirable impacts to cave resources and therefore lead to permits being required in additional caves.

Seasonal closures to protect bat colonies would reduce recreational cave opportunities. Disruption to recreational opportunities would be dependent upon the season of the closures. Winter closures for hibernating bats would have minimal impacts upon recreational opportunities as this is the season with the lowest visitation rates. Seasonal closures for maternity colonies would have the highest probability of reducing recreational opportunities as it would coincide with the high use period for recreational visitation.

Cave use permits are proposed for five of the caves on the District. Of these five caves, three are proposed for an office-issued permit system whereby visitors must obtain a permit from the office and return a post-use visitation report following their cave visit. The remaining two caves would have an on-site, self-issued, self-permit system whereby recreationists would permit themselves prior to entering the cave. The remaining caves on the District would not have a permit system. On-site permitting would have minimal impacts to cave visitation as visitors would be able to permit themselves. Conversely, this allows less oversight of compliance with the group's size limitations and frequency limitations. Office-issued permitting would create some inconvenience for recreationists. Those willing to go through the process would be able to secure a permit subject to the group size and frequency limitation. It is anticipated that there would be a certain amount of the public that would not comply with these requirements. The inconvenience of these permit systems has potential to displace use to other caves thereby increasing use in other caves above what is currently being observed. This displacement may lead to additional restrictions being placed on other caves to protect cave resources.

Permit systems allow an opportunity for the agency and the recreationist to interact and provides an educational opportunity. This education, in theory, would then lead to more responsible use of the caves on the District. It is anticipated that some of the public would not be in favor of the permit system. The adaptive management strategy allows the agency to incrementally implement

management actions as monitoring indicates the need for additional protection. This allows the lowest level of constraint necessary to protect the resources.

Monitoring of cave visitation may be verified through the use of additional monitoring methods, including infrared counters and trail counters. These monitoring methods may be used to verify register and permit compliance as well as to determine appropriate visitation thresholds. If permit systems and visitation thresholds are not able to mitigate impacts to cave resources, additional measures may be taken to further mitigate recreation impacts to cave resources. This adaptive management approach allows the agency to implement the lowest level of cave management restrictions possible to mitigate undesirable impacts to cave resources. Through this approach, it is anticipated that impacts to recreational use of caves would be minimized.

The proposed gating of Goshute Cave would restrict visitor use within the cave. Register data indicates that this cave receives relatively high visitation as compared to other caves on the District and has seen large groups in the past. The restriction on visitation to the cave would displace some of the recreational use to other caves on the District.

The Cave Valley Cave gating proposal to close the main entrance and side-passage would have an impact to recreational users. The permit system would continue to allow access on a limited basis. The proposed restoration project to remove graffiti would improve visitor experience within the cave.

Queen of Sheba Cave is presently gated. The replacement of the gate and lock at this location would not have an impact as compared to present recreational use.

Historic recreational use of Rose Guano Bat Cave has been relatively low. The proposed year-long closure of the cave will have little impact to recreational use.

Recreational use on the District is relatively light when compared to other recreational uses on public lands. Displacement of visitation to other recreational activities is anticipated to be negligible as compared to the levels of use in the other activities.

The development of a Search and Rescue Plan that includes cooperators from multiple levels of government, other federal agencies, and those with special expertise, would be an indirect benefit to the general public in the event of an emergency.

Education and outreach programs would be a vital component of the Proposed Action. The management actions prescribed and the impacts to the recreational public would be a substantial change to the way these caves have been managed. It is anticipated that the changes on those members of the public who are not presently familiar with the caves on the District would be minimal. Those members of the public who are familiar with the caves on the District would have the greatest amount of adjustment to the new management actions. Education and outreach would provide them the information behind the restrictions and how to comply with them.

Research, exploration, and restoration activities within and around caves on the District would provide indirect benefits to recreation. As we learn more about the caves, we can learn how to better protect them for future generations as well as pass the information on to the general public (appropriate levels of information while protecting the cave resources) increasing awareness of cave resources. Restoring them to a previous condition would provide a more natural experience for recreationists.

Impacts from No Action

In the No Action Alternative, cave resources would continue to be managed as they are currently. Cave resources on the District would continue to be managed consistent with the FCRPA and the existing EYDO Cave Management Plan (1986). All proposed cave projects and cave uses would be analyzed in accordance with NEPA on a case-by-case basis. Damage to caves and the need for management actions within caves would require site-specific proposals and NEPA. Site-specific documents would delay the implementation of the actions and potentially put cave resources at greater risk from recreational uses. The No Action Alternative would not have any direct impacts to recreational uses. However, the lack of appropriate management actions to adequately protect cave resources may lead to more stringent restrictions in the future to protect cave resources.

3.2.6 Geology

3.2.6.1 Affected Environment

Collectively, caves on the District contain a high diversity of unique and common types of geologic formations. Some of the unique types of speleothems include: helictites, folia, dog tooth spar, cave shields, anthodites, rimstone, mammillaries, cave pearls, and moonmilk. More common speleothems found in caves on the District include: stalagmites, stalactites, flowstone, soda straws, and columns.

Cave walls and speleothems have been inscribed, etched, and painted with names and dates beginning in the late 19th century. Monitoring efforts indicate that some speleothems that were once intact have been intentionally broken off or removed. For additional information on the District's more popular caves, see Caves on the District (Section 1.7) in the Plan.

3.2.6.2 Environmental Consequences

Impacts from the Proposed Action

The Proposed Action would have predominately positive impacts on geologic formations within caves on the District. Proposed management actions (listed above in EA Table 1) that would benefit geologic formations include: photo and impact monitoring, establishing group size limits, managing cave visitation frequency, cave use permits, cave gates, cave closures, interpretation and education, cave trails, and restoration projects.

Establishing and maintaining photo monitoring points and conducting impact monitoring would allow the EYDO to regularly track conditions of geologic formations. Monitoring geologic formations would help the EYDO identify new defacement, which may determine changes in management (e.g., law enforcement needs, permitting, cave gates, or restoration projects) to protect geologic formations.

Managing the number of recreationalists (in all caves on the District) and visitation frequency (in caves specified in the Proposed Action) would minimize disturbance to geologic formations. As mentioned in the Plan, caves have a limited self-cleaning ability. Managing group sizes would lessen impacts created by large groups. If a large group of recreationists visit a cave in a short period of time, the cave environment may be damaged (e.g., accidental speleothem breakage or dust impacting formations).

Cave use permits can help the EYDO control and track recreational use within caves while protecting geologic formations. Permits also create an opportunity to educate recreationists about responsible caving etiquette, specifically through office-issued cave permits for Cave Valley Cave, Goshute Cave, and Whipple Cave.

Installing cave gates on Goshute Cave and on the entrance and side-passage in Cave Valley Cave would help the EYDO control visitor use and minimize disturbance to geologic formations. The formations found within Goshute Cave and Cave Valley Cave would greatly benefit from controlled visitation. Potential negative impacts could occur if a cave gate was installed directly into fragile speleothems, which the EYDO would ensure would not occur during installation.

The Proposed Action establishes a year-round closure for Rose Guano Bat Cave and a year-round closure of Cave Valley Cave's side-passage. Closures on these two caves would protect the geologic formations found within.

Interpretative signs and educational programs would increase public awareness on the importance of preserving cave resources. Education is an integral part of protecting cave resources for current and future generations. The EYDO would focus on educating recreationalists on various topics, including appropriate cave etiquette (i.e., *Leave No Trace* caving principles) and safety concerns. These topics would help protect geologic formations. Cave monitoring trips have indicated an excessive amount of vandalism and graffiti in several caves on the District (see Section 1.7 of the Plan). Installing interpretive signs outside of Cave Valley Cave, Goshute Cave, and Rose Guano Bat Cave would increase public awareness and hopefully deter future acts of vandalism to geologic formations.

Cave trails could lessen the need for recreationalists to explore off main routes and on to fragile geologic formations. Currently, Queen of Sheba is the only cave on the District with an intentional trail laid out. This cave trail was established to protect significant geologic formations.

Cave restoration serves to mitigate direct or indirect negative effects to geologic formations by actions such as vandalism. Restoration projects in caves with vandalism and graffiti would significantly help improve the naturalness of the cave environment. Restoration projects could serve as a tool to decrease future actions of vandalism. For Cave Valley Cave, a restoration project is proposed to be completed within one year from the completion of this Plan. Sandblasting would be conducted to remove a majority of the graffiti found within the cave. Using a sandblaster would impact the cave walls, but would have a benefit to the natural integrity of the geologic formations.

Impacts from the No Action Alternative

In the No Action Alternative, cave resources would continue to be managed as they are currently. District cave resources would be managed consistent with the FCRPA and the existing EYDO Cave Management Plan (1986). The No Action Alternative would continue to allow uncontrolled recreational use in caves on the District. High recreational use and a lack of knowledge regarding proper caving etiquette could impact geologic formations found in District caves.

3.2.7 Wilderness & Wilderness Study Areas

3.2.7.1 Affected Environment

The Wilderness Act of 1964 established the National Wilderness Preservation System to ensure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas of the United States. Wilderness designation is intended to preserve and protect certain lands in their natural state. Only Congress, with Presidential approval, may designate public lands as wilderness. The Wilderness Act defines wilderness and mandates that the primary management direction is to preserve wilderness character. Although wilderness character is a complex idea and is not explicitly defined in the Wilderness Act, the qualities of wilderness character are commonly described as:

- **Untrammeled**- area is unhindered and free from modern human control or manipulation.
- **Natural**- area appears to have been primarily affected by the forces of nature.
- **Undeveloped**- area is essentially without permanent improvements or human occupation and retains its primeval character.
- **Outstanding opportunities for solitude or a primitive and unconfined type of recreation**- area provides outstanding opportunities for people to experiences solitude or primeval and unrestricted recreation, including the values associated with physical and mental inspiration and challenge.
- **Supplemental values**- complementary features of scientific, educational, scenic, or historic values.

The District currently manages 22 designated wilderness areas, which were designated under three congressional acts:

- Nevada Wilderness Protection Act of 1989,
- Lincoln County Conservation, Recreation, and Development Act of 2004, and
- White Pine County Conservation, Recreation, and Development Act of 2006.

These wildernesses encompass approximately 1,177,815 acres of public lands. These areas have high-quality opportunities for primitive and unconfined recreation and solitude due to the variety of landforms and low level of human activity. Special features include prehistoric and historic resources, caves, bristlecone pines and riparian vegetation. The designated wilderness areas are managed in accordance with the Wilderness Act, Manual 6340 – Management of Designated Wilderness, and the area’s specific wilderness management plan.

Known cave resources exist in several wildernesses; Goshute Cave, Leviathan Cave, and Whipple Cave are some of the most popular and extensive caves on the District. A number of smaller cave resources are also located in designated wilderness: Angel of Death Cave, Lavender Cave, and several caves in Ninemile Canyon.

WSA is an area identified by the BLM as having wilderness characteristics, thus making it worthy of consideration by Congress for wilderness designation. Per FLPMA, WSAs must be managed “in a manner so as not to impair the suitability of such areas for preservation as wilderness.” Further, BLM Manual 6330 – Management of Wilderness Study Areas provides policy direction for meeting the non-impairment standard. The EYDO currently manages two WSAs: Park Range and Riordan’s Well WSAs in Nye County. Portions of two additional WSAs also extend onto the District: Blue Eagle and Antelope Range WSAs, however the Battle Mountain District has management oversight of these. The EYDO monitors the portions on the District. No known cave resources exist within these WSAs, but if they are found in the future they would be managed to the non-impairment standard. The two criteria for the non-impairment standard are: 1) the use or facility is temporary, and 2) the use or facility will not create new surface disturbances.

3.2.7.2 Environmental Consequences

Impacts from the Proposed Action

Untrammled: Many of the proposed actions would not affect the earth and its community of life. Restorations actions, depending on the intensity and methods, could affect the untrammled quality if water flow, water quality or cave life are impacted. These actions would be carefully considered before they were implemented to mitigate any potential impacts to the maximum extent possible. For example, if sand-blasting occurs within a cave to remove graffiti, the sand and paint flakes should be captured with tarps to avoid contaminating water quality or affecting cave biota.

Timing of restoration projects, monitoring and surveying visits, or large group exceptions would be planned to avoid bat use, taking into account the particular cave, and seasonality of bat use.

Natural: Many of the proposed management actions (monitoring, visitor use, restoration, surface management) are aimed at improving the naturalness of the caves. Educational efforts regarding appropriate cave use and promoting cave ethics will help preserve the cave resources, and therefore the naturalness of the wilderness caves. By regulating visitor use (limits, permits, or gates) the impacts to the natural settings of the caves could be managed. The education provided through the permit system process would also help relay respectful caving practices to visitors further reducing impacts.

The proposed gate on Goshute Cave would be constructed to accommodate bat use with the least impacts possible. Other larger animals, such as mountain lions, may occasionally use caves and would therefore be impacted by the gate, though there are no known observations of use by mountain lions in Goshute Cave. Any other gating proposals in wilderness would require site-specific NEPA analysis in conjunction with a Minimum Requirements Analysis.

Undeveloped: All activities that authorize the use of motorized and mechanized vehicles and equipment would result in temporary and localized, short-term effects to the undeveloped quality of wilderness character.

Resource monitoring in wilderness caves is ongoing, however small installations may be placed within wilderness caves to monitor visitor use, water levels, temperature and humidity, or other environmental or social conditions or changes. These small and generally short-term (1-2 years) installations would impact the undeveloped quality of the wilderness while the installations are in place. These impacts would be mitigated by placing the installations where visitors are unlikely to notice them, whenever possible.

Gating Goshute Cave would impair the undeveloped quality of the wilderness in the long-term, as it is assumed the gate would be installed and maintained permanently. A Minimum Requirements Analysis has been completed to determine the necessity of this action in the wilderness context (Step 1), and to review alternative methods for installing the gate (Step 2) to determine the least impacting method of construction. In addition to the gate itself, temporary use of motorized tools and equipment (generator, drill, power saw, welding torch) would be authorized for the project. People, materials, and equipment would all be hiked into the site.

Outstanding Opportunities for Solitude or a Primitive and Unconfined Type of Recreation: Management of visitors by implementing group size limits, frequency limits, and required cave use permits impact recreationists' ability to have unconfined recreation within the wilderness. This is particularly dramatic for Goshute Cave, and Whipple Cave, and to a lesser degree Leviathan Cave, where the main recreation occurring in the wilderness is cave-oriented visitation. Gating Goshute Cave would pose additional impacts to the unconfined type of recreation as the group size, frequency, and permit restrictions would be better enforced.

Based on past data from Goshute Cave, about 10% of the groups that visited (2011-2014) were over the proposed group size limit of 8 persons. Leviathan Cave data (2000-2014) shows that 7% of the groups would be affected by the group size limitation. For Whipple Cave (2011-2013) 16% of groups exceeded 8 persons, where as 6% of the groups exceeded 12 persons.

Currently, opportunities for solitude in wilderness caves are generally available. Occasionally, a group will encounter a second group on the same visit. By implementing group frequently limits, a group would not encounter another group during their visit, thus improving opportunities for solitude while impacting opportunities for unconfined recreation. However, this will be difficult to enforce on un-gated caves with easy access, such as Whipple Cave.

Educational efforts regarding caves aim to improve respectful cave visitation by the public (e.g., *Leave No Trace* and WNS protocols). Education will be paramount for implementing the visitor use restrictions (limits, permits) on the un-gated caves. It is likely during and following the NSS Convention, there will be a spike in recreational visitation to these caves. That time period will also be an avenue for educating the local public about respectful visitation, and restrictions.

Wilderness Study Areas: No known cave resources exist within District WSAs, but if they are found in the future they would be managed to the non-impairment standard.

Impacts from the No Action Alternative

Untrammeled: The No Action Alternative would not affect the untrammeled quality of wilderness, whether positively or negatively. The existing EYDO Cave Management Plan (1986) would still be followed; however, it does not consider designated wilderness within it.

Undeveloped: When compared with the proposed action the no action would be less impacting in terms of the undeveloped quality. The No Action Alternative would not allow for the gating of Goshute Cave (and the motorized tools proposed), or installation of data loggers (temperature, visitors, etc.).

Natural: The No Action Alternative would degrade the natural quality of wilderness character, when compared to the Proposed Action. Unregulated visitor use has led to impacts of varying degrees in wilderness caves. This would continue, and possibly degrade further under this alternative.

Outstanding Opportunities for Solitude or a Primitive and Unconfined Type of Recreation: Under this alternative, opportunities for solitude would be degraded as visitor use would be unregulated and groups may encounter other groups at the caves. Conversely, opportunities for primitive and unconfined recreation would be unchanged.

CHAPTER 4: CUMULATIVE IMPACTS

4.1 PAST, PRESENT, AND REASONABLY FORESEEABLE FUTURE ACTIONS

Cumulative impacts result from the incremental impact of an action when added to other past, present, and future actions, regardless of what agency or other person undertakes such other actions. Cumulative impacts could result from individually inconsequential but, collectively significant actions, taking place over a period of time.

This section identifies past, present, and reasonably foreseeable future actions so that their contribution to cumulative impacts can be considered. Past actions are those that have been completed to date, present actions may have been started in the past but are ongoing and are not yet completed, and future actions are those for which there is a reasonable confidence they will occur.

The purpose of the cumulative impacts analysis for the Proposed Action is to evaluate the combined, incremental effects of human activity within the scope of the project. The Council on Environmental Quality regulations define scope and state that connected actions, cumulative actions, and similar actions should be included in the effects analysis (40 CFR 1508.25). The cumulative impacts analysis should be limited to those issues and resource values identified during scoping that are of major importance.

Issues of major importance identified during internal and external scoping focused on actions relating to the following: restoring caves with vandalism; preventing future vandalism and impacts caused by recreational use; completing cave resource inventory; protecting bat colonies; monitoring WNS and preventing the spread of the fungus by cavers; conducting cave resource monitoring; and incompatible land uses.

The geographic area of analysis is the area encompassed by each of the caves and areas immediately surrounding the cave entrances on the District.

4.1.1 Past Actions

Past actions within the project area include:

- Guano and clay mining has occurred in two significant caves on the District
- Recreational use
- Scientific research and collection
- Resource and visitor use monitoring
- Restoration work
- Installation of interpretive signs
- Fire suppression
- Noxious weed treatments

- Installation of cave gates to protect significant cave resources (i.e., cultural, biological, or geological)
- Special designations include caves (e.g., wilderness, segregation, and ACEC), which have specific management prescriptions

4.1.2 Present Actions

Current actions within the project area include:

- Recreational use
- Nearby climbing opportunities
- Scientific research and collection
- Resource and visitor use monitoring
- Installation of interpretive signs
- Fire suppression
- Noxious weed treatments

4.1.3 Reasonably Foreseeable Future Actions

The reasonably foreseeable future actions (RFFAs) within the project area include the following:

- Increased visitor use associated with and following the NSS Convention on the District in 2016
- Fire suppression activities and noxious weed treatment activities are ongoing across the District
- White-Nose Syndrome and the potential introduction to Nevada bat populations
- Submittal of Application for Permit to Drill to explore for oil beneath existing leases
- Location of new mining claims adjacent to or overlapping cave resources
- Commence petition-application process to seek Secretarial withdrawal of unprotected caves unencumbered with existing rights
- Restoration work

4.2 CUMULATIVE IMPACTS ANALYSIS

4.2.1 Wildlife & Special Status Species

Past, present, and reasonably foreseeable future actions, along with the Proposed Action, would not have a cumulative impact on wildlife or special status species. The implementation of BLM Containment and Decontamination Procedures would minimize the risk of WNS affecting the District's bat populations, if it ever became an issue in Nevada.

4.2.2 Cultural Resources

Past, present, and reasonably foreseeable future actions would have a cumulative impact on cultural resources. Past and present actions such as clay and guano mining, recreational use, nearby climbing opportunities, scientific research and collection actions, restoration, installation of interpretive signs, fire suppression, noxious weed treatment, and installations of caves gates have the potential to negatively impact cultural resources. It is possible that these past actions have resulted in a loss of integrity, damage, or even destruction of historic properties. However, resource and visitor use monitoring and special designations could continue to protect cultural resources within caves; thus, having a positive cumulative impact on cultural resources.

RFFAs also have potential for a negative cumulative impact. Increased visitor use puts resources at a greater risk for damage, vandalism, and destruction. Ground disturbing activities like fire suppression and mining activities also increase risk for negative impacts on historic properties.

4.2.3 Paleontological Resources

Past, present, and reasonably foreseeable future actions would have a cumulative impact on paleontological resources. Past and present actions such as clay and guano mining, recreational use, nearby climbing opportunities, scientific research and collection actions, restoration, installation of interpretive signs, fire suppression, noxious weed treatment, and installations of cave gates have the potential to negatively impact paleontological resources. It is possible that these past actions have resulted in a gradual loss of integrity, increased damage, or even destruction of historic properties. However, resource and visitor use monitoring and special designations could continue to protect paleontological resources within caves; thus, having a positive cumulative impact on paleontological resources.

RFFAs also have potential for a negative cumulative impact. Increased visitor use puts resources at a greater risk for damage, vandalism, and destruction. Ground disturbing activities like fire suppression and mining activities also increase risk for negative impacts on paleontological resources.

4.2.4 Recreation

The NSS Convention has the potential to increase awareness of cave resources on the District. Visitation to caves following the Convention (if permitted) may increase. It is anticipated that the remoteness of Ely and associated caves would limit the increase in use. The increase as a result of the Convention would be anticipated to slowly diminish over time. Protection of cave resources as a result of the RFFA's would provide an indirect benefit to the public by protecting cave resources for future generations.

4.2.5 Geology

When viewed in the context of the past, present, and reasonably foreseeable future actions, the Proposed Action poses a beneficial cumulative effect to geologic formations. Past and present actions such as clay and guano mining, recreational use, nearby climbing opportunities, and scientific research and collection actions impacted geologic formations.

RFFAs have potential for a negative cumulative impact on geologic formations. Visitation from the NSS Convention may increase visitor use, which will increase the risk of damage, vandalism, and/or destruction of geologic formations.

Cumulatively, with the implementation of the Proposed Action, caves on the District would be better managed and better protected. Resource monitoring, special designations, installation of interpretive signs and cave gates, and restoration work would continue to protect geological formations within caves.

4.2.6 Wilderness

When viewed in the context of the past, present, and reasonably foreseeable future actions, the proposed Plan poses a beneficial effect on wilderness character. The natural quality of caves would be better protected by addressing past vandalism, and heavy visitor use. The outstanding opportunities for solitude would be benefited with visitor use management. There is little to no cumulative effect on the undeveloped and untrammelled qualities.

4.2.7 Conclusion

Cumulative impacts associated with past, present, or reasonably foreseeable future actions within the analysis area, would have an estimated negligible, but have a net positive effect on the environment. When added to other foreseeable actions in the analysis area, management actions included in the Proposed Action would preclude, minimize, or mitigate human-caused impacts to cave resources.

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APPENDICES

APPENDIX 1-
FEDERAL CAVE RESOURCES PROTECTION ACT

Federal Cave Resources Protection Act Reprinted (with corrections) from the NSS News, December 1988, pp 460-461.

United States Code: 16 USC Sec. 4301 TITLE 16 CHAPTER 63

- Sec. 1. SHORT TITLE.
- Sec. 2. FINDINGS, PURPOSES, AND POLICY.
- Sec. 3. DEFINITIONS.
- Sec. 4. MANAGEMENT ACTIONS.
- Sec. 5. CONFIDENTIALITY OF INFORMATION CONCERNING NATURE AND LOCATION OF SIGNIFICANT CAVES.
- Sec. 6. COLLECTION AND REMOVAL FROM FEDERAL CAVES.
- Sec. 7. PROHIBITED ACTS AND CRIMINAL PENALTIES.
- Sec. 8. CIVIL PENALTIES.
- Sec. 9. MISCELLANEOUS PROVISIONS.
- Sec.10. SAVINGS PROVISIONS.

BE IT ENACTED BY THE SENATE AND THE HOUSE OF REPRESENTATIVES OF THE UNITED STATES OF AMERICA IN CONGRESS ASSEMBLED,

SEC. 1. SHORT TITLE. This Act may be referred to as the "Federal Cave Resources Protection Act of 1988"

SEC. 2. FINDINGS, PURPOSES, AND POLICY.

a) FINDINGS. —The Congress finds and declares that —(1) significant caves on Federal lands are an invaluable and irreplaceable part of the Nation's natural heritage; and (2) in some instances, these significant caves are threatened due to improper use, increased recreational demand, urban spread, and a lack of specific statutory protection.

(b) PURPOSES. —The purposes of this Act are —(1) to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people; and (2) to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, education, or recreational purposes.

(c) POLICY. —It is the policy of the United States that Federal lands be managed in a manner which protects and maintains, to the extent practical, significant caves.

SEC. 3. DEFINITIONS.

For purposes of this Act:

(1) CAVE. —The term "cave" means any naturally occurring void, cavity, recess, or system of interconnected passages which occurs beneath the surface of the earth or within a cliff or ledge (including any cave resource therein, but not including any vug, mine, tunnel, aqueduct, or other manmade excavation) and which is large enough to permit an individual to enter, whether or not the entrance is naturally formed or manmade. Such term shall include any natural pit, sinkhole, or other feature which is an extension of the entrance.

(2) FEDERAL LANDS. —The term "Federal lands" means lands the fee title to which is owned by the United States and administered by the Secretary of Agriculture or the Secretary of the Interior.

(3) INDIAN LANDS. —The term "Indian lands" means lands of Indian tribes or Indian individuals which are either held in trust by the United States for the benefit of an Indian tribe or subject to a restriction against alienation imposed by the United States.

(4) INDIAN TRIBE. —The term "Indian tribe" means any Indian tribe, band, nation, or other organized group or community of Indians, including any Alaska Native village or regional or village corporation as defined in, or established pursuant to, the Alaska Native Claims Settlement Act (43 U.S.C. 1601 et seq.).

(5) CAVE RESOURCE. —The term "cave resource" includes any material or substance occurring naturally in caves on Federal lands, such as animal life, plant life, paleontological deposits, sediments, minerals, speleogens, and speleothems.

(6) SECRETARY. —The term "Secretary" means the Secretary of Agriculture or the Secretary of the Interior, as appropriate.

(7) SPELEOTHEM. —The term "speleothem" means any natural mineral formation or deposit occurring in a cave or lava tube, including but not limited to any stalactite, stalagmite, helictite, cave flower, flowstone, concretion, drapery, rimstone, or formation of clay or mud.

(8) SPELEOGEN. —The term "speleogen" means relief features on the walls, ceiling, and floor of any cave or lava tube which are part of the surrounding bedrock, including but not limited to anastomoses, scallops, meander niches, petromorphs and rock pendants in solution caves and similar features unique to volcanic caves.

Sec. 4. MANAGEMENT ACTIONS.

(a) REGULATIONS. —Not later than nine months after the date of the enactment of this Act, the Secretary shall issue such regulations as he deems necessary to achieve the purposes of the Act. Regulations shall include, but not be limited to, criteria for the identification

of significant caves The Secretaries shall cooperate and consult with one another in preparation of the regulations. To the extent practical regulations promulgated by the respective Secretaries should be similar.

(b) IN GENERAL. —The secretary shall take such actions as may be necessary to further the purposes of this Act. These actions shall include (but not be limited to) —

(1) identification of significant caves on federal lands;

(A) The Secretary shall prepare an initial list of significant caves for lands under his jurisdiction not later than one year after the publication of final regulations using the significance criteria defined in such regulations. Such a list shall be developed after consultation with appropriate private sector interests, including cavers.

(B) The initial list of significant caves shall be updated periodically, after consultation with appropriate private sector interests, including cavers. The Secretary shall prescribe by policy or regulation the requirements and process by which the initial list will be updated, including management measures to assure that caves under consideration for the list are protected during the period of consideration. Each cave recommended to the Secretary by interested groups for possible inclusion on the list of significant caves shall be considered by the Secretary according to the requirements prescribed pursuant to this paragraph and shall be added to the list if the Secretary determines that the cave meets the criteria for significance as defined by the regulations.

(2) regulation or restriction of use of significant caves, as appropriate;

(3) entering into volunteer management agreements with persons of the scientific and recreational caving community; and

(4) appointment of appropriate advisory committees

(c) PLANNING AND PUBLIC PARTICIPATION.

The Secretary shall —

(1) ensure that significant caves are considered in the preparation or implementation of any land management plan if the preparation or revision of the plan began after the enactment of this Act;

(2) foster communication, cooperation, and exchange of information between land managers, those who utilize caves, and the public.

Sec. 5. CONFIDENTIALITY OF INFORMATION CONCERNING NATURE AND LOCATION OF SIGNIFICANT CAVES.

(a) IN GENERAL. —Information concerning the specific location of any significant cave may not be made available to the public under section 552 of title 5, United States Code, unless the Secretary determines that disclosure of such information would further the purposes of this Act and would not create a substantial risk of harm, theft, or destruction of such cave.

(b) EXCEPTIONS. —Notwithstanding subsection (a), the Secretary may make available information regarding significant caves upon the written request by Federal and state governmental agencies or bona fide educational and research institutions. Any such written request shall, at a minimum:

(1) describe the specific site or area for which information is sought;

(2) explain the purpose for which such information is sought; and

(3) include assurances satisfactory to the Secretary that adequate measures are being taken to protect the confidentiality of such information and to ensure the protection of the significant cave from destruction by vandalism and unauthorized use.

Sec. 6. COLLECTION AND REMOVAL FROM FEDERAL CAVES.

(a) PERMIT. —The Secretary is authorized to issue permits for the collection and removal of cave resources under such terms and conditions as the Secretary may impose, including the posting of bonds to insure compliance with the provisions of any permit.

(1) Any permit issued pursuant to this section shall include information concerning the time, scope, location, and specific purpose of the proposed collection, removal or associated activity, and the manner in which such collection, removal, or associated activity is to be performed must be provided.

(2) The Secretary may issue a permit pursuant this subsection only it he determines that the proposed collection or removal activities are consistent with the purposes of this Act and with other applicable provisions of law.

(b) REVOCATION OF PERMIT. —Any permit issued under this section shall be revoked by the Secretary upon a determination by the Secretary that the permittee has violated any provision of this Act, or has failed to comply with any other condition upon which the permit was issued. Any such permit shall be revoked by the Secretary upon assessment of a civil penalty against the permittee pursuant to section 8 or upon the permittee's conviction under section 7 of this Act.

The Secretary may refuse to issue a permit under this section to any person who has violated any provision of this Act or who has failed to comply with any condition of a prior permit.

(c) TRANSFERABILITY OF PERMITS. —Permits issued under this act are not transferable.

(d) CAVE RESOURCES LOCATED ON INDIAN LANDS. —

(1) (A) Upon application by an Indian tribe, the Secretary is authorized to delegate to the tribe all authority of the Secretary under this section with respect to issuing and enforcing permits for the collection or removal of any cave resource located on the affected Indian lands.

(B) In the case of any permit issued by the Secretary for the collection or removal of any cave resource, or to carry out activities associated with such collection or removal, from any cave resource located on Indian lands (other than permits issued pursuant to subparagraph (A)), the permit may be issued only after obtaining the consent of the Indian or Indian tribe owning or having jurisdiction over such lands. The permit shall include such reasonable terms and conditions as may be requested by such Indian or Indian tribe.

(2) If the Secretary determines that issuance of a permit pursuant to this section may result in harm to, or destruction of, any religious or cultural site, the Secretary, prior to issuing such permit, shall notify any Indian tribe which may consider the site as having significant religious or cultural importance. Such notice shall not be deemed a disclosure to the public for purposes of section 5.

(3) A permit shall not be required under this section for the collection or removal of any cave resource located on Indian lands or activities associated with such collection, by the Indian or Indian tribe owning or having jurisdiction over such lands.

(e) **EFFECT OF PERMIT.** —No action specifically authorized by a permit under this section shall be treated as a violation of section 7.

Sec. 7. PROHIBITED ACTS AND CRIMINAL PENALTIES.

(a) PROHIBITED ACTS. —

(1) Any person who, without prior authorization from the Secretary, knowingly destroys, disturbs, defaces, mars, alters, removes or harms any significant cave or alters the free movement of any animal or plant life into or out of any significant cave located on Federal lands, or enters a significant cave with the intention of committing any act described in this paragraph shall be punished in accordance with subsection (b).

(2) Any person who possesses, consumes, sells, barter or exchanges, or offers for sale, barter or exchange, any cave resource from a significant cave with knowledge or reason to know that such resource was removed from a significant cave located on Federal lands shall be punished in accordance with subsection (b).

(3) Any person who counsels, procures, solicits, or employs any other person to violate any provisions of this subsection shall be punished in accordance with subsection (b).

(4) Nothing in this section shall be deemed applicable to any person who was in lawful possession of a cave resource from a significant cave prior to the date of enactment of this Act.

(b) **PUNISHMENT.** —The punishment for violating any provision of subsection (a) shall be imprisonment of not more than one year or a fine in accordance with the applicable provisions of

title 18 of the United States Code, or both. In the case of a second or subsequent violation, the punishment shall be imprisonment of not more than 3 years or a fine in accordance with the applicable provisions of title 18 of the United States Code, or both.

Sec. 8. CIVIL PENALTIES.

(a) ASSESSMENT. —

(1) The Secretary may issue an order assessing a civil penalty against any person who violates any prohibition contained in this Act, any regulation promulgated pursuant to this Act, or any permit issued under this Act. Before issuing such an order, the Secretary shall provide such person written notice and the opportunity to request a hearing on the record within 30 days. Each violation shall be a separate offense, even if such violations occurred at the same time.

(2) The amount of such civil penalty shall be determined by the Secretary taking into account appropriate factors, including (A) the seriousness of the violation; (B) the economic benefit (if any) resulting from the violation; (C) any history of such violations; and (D) such other matters as the Secretary deems appropriate. The maximum fine permissible under this section is \$10,000.

(b) JUDICIAL REVIEW. —Any person aggrieved by an assessment of a civil penalty under this section may file a petition for judicial review of such assessment with the United States District Court for the District of Columbia or for the district in which the violation occurred. Such a petition shall be filed within the 30-day period beginning on the date the order assessing the civil penalty was issued.

(c) COLLECTION. —If any person fails to pay an assessment of a civil penalty

(1) within 30 days after the order was issued under subsection (a), or

(2) if the order is appealed within such 30-day period, within 10 days after the court has entered a final judgment in favor of the Secretary under subsection(b), the Secretary shall notify the Attorney General and the Attorney General shall bring a civil action in an appropriate United States district court to recover the amount of penalty assessed (plus costs, attorneys' fees, and interest at currently prevailing rates from the date the order was issued or the date of such final judgment, as the case may be). In such an action, the validity, amount, and appropriateness of such penalty shall not be subject to review.

(d) SUBPOENAS. —The Secretary may issue subpoenas in connection with proceedings under this subsection compelling the attendance and testimony of witnesses and subpoenas duces tecum, and may request the Attorney General to bring an action to enforce any subpoena under this section. The district courts shall have jurisdiction to enforce such subpoena and impose sanctions.

Sec. 9. MISCELLANEOUS PROVISIONS.

(a) AUTHORIZATION. —There are authorized to be appropriated \$100,000 to carry out the purposes of this Act.

(b) EFFECT ON LAND MANAGEMENT PLANS. —Nothing in this act shall require the amendment or revision of any land management plan, the preparation of which began prior to the enactment of this Act.

(c) FUND. —Any money collected by the United States as permit fees for collection and removal of cave resources; received by the United States as a result of the forfeiture of a bond or other security by a permittee who does not comply with the requirements of such permit issued under section 7; or collected by the United States by way of civil penalties or criminal fines for violations of this Act shall be placed in a special fund in the Treasury. Such moneys shall be available for obligation or expenditure (to the extent provided for in advance in appropriation Acts) as determined by the Secretary for the improved management, benefit, repair, or restoration of significant caves located on Federal lands.

(d) EXISTING RIGHTS. —Nothing in this act shall be deemed to affect the full operation of the mining and mineral leasing laws of the United States, or otherwise affect valid existing rights.

Sec. 10. SAVINGS PROVISIONS.

(a) WATER. —Nothing in this Act shall be construed as authorizing the appropriation of water by any Federal, State, or local agency, Indian tribe, or any other entity or individual. Nor shall any provision of this Act:

(1) affect the rights or jurisdiction of the United States, the States, Indian tribes, or other entities over water of any river or stream or over any groundwater resource;

(2) alter, amend, repeal, interpret, modify, or be in conflict with any interstate compact made by the States; or

(3) alter or establish the respective rights of States, the United States, Indian tribes, or any person with respect to any water or water related right.

(b) FISH AND WILDLIFE. —Nothing in this Act shall be construed as affecting the jurisdiction or responsibilities of the States with respect to fish and wildlife.

APPENDIX 2-
CFR TITLE 43 PART 37

CFR Title 43--Public Lands: Interior Subtitle A-- Office of
the Secretary of the Interior Part 37--Cave Management

Be it enacted by the Senate and the House of Representatives of the United
States of America in Congress Assembled

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SUBPART A--CAVE MANAGEMENT--GENERAL

- s 37.1 Purpose.

The purpose of this part is to provide the basis for identifying and managing significant caves on Federal lands administered by the Secretary of the Interior.

- s 37.2 Policy.

It is the policy of the Secretary that Federal lands be managed in a manner which, to the extent practical, protects and maintains significant caves and cave resources. The type and degree of protection will be determined through the agency resource management planning process with full public participation.

- s 37.3 Authority.

Section 4 of the Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. 4301) authorizes the Secretary to issue regulations providing for the identification of significant caves. Section 5 authorizes the Secretary to withhold information concerning the location of significant caves under certain circumstances.

s 37.4 Definitions.

(a) Authorized officer means the agency employee delegated the authority to perform the duties described in this part.

(b) Cave means any naturally occurring void, cavity, recess, or system of interconnected passages beneath the surface of the earth or within a cliff or ledge, including any cave resource therein, and which is large enough to permit a person to enter, whether the entrance is excavated or naturally formed. Such term shall include any natural pit, sinkhole, or other feature that is an extension of a cave entrance or which is an integral part of the cave.

(c) Cave resources means any materials or substances occurring in caves on Federal lands, including, but not limited to, biotic, cultural, mineralogic, paleontologic, geologic, and hydrologic resources.

(d) Federal lands, as defined in the Federal Cave Resources Protection Act, means lands the fee title to which is owned by the United States and administered by the Secretary of the Interior.

(e) Secretary means the Secretary of the Interior.

(f) Significant cave means a cave located on Federal lands that has been determined to meet the Criteria in s 37.11(c).

s 37.5 Collection of information.

(a) The collections of information contained in this part have been approved by the Office of Management and Budget under 44 U.S.C.3501 et seq. and assigned clearance numbers 1004-0165 (cave nominations) and 1004-0166 (confidential information). The information provided for the cave nominations will be used to determine which caves will be listed as "significant" and the information in the requests to obtain confidential cave information will be used to decide whether to grant access to this information. Response to the call for cave nominations is voluntary. No action may be taken against a person for refusing to supply the information requested. Response to the information requirements for obtaining confidential cave information is required to obtain a benefit in accordance with Section 5 of the Federal Cave Resources Protection Act of 1988 (102 Stat. 4546; 16 U.S.C. 4301).

(b) The public reporting burden is estimated to average 3 hours per response for the cave nomination and one-half hour per response for the confidential cave information request. The estimated response time for both of the information burdens includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the

collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to Bureau of Land Management Clearance Officer, WO-873, Mail Stop 401 LS, 1849 C Street NW., Washington, DC 20240; and the Office of Management and Budget, Paperwork Reduction Project 1004-016 5/6 , Washington, D.C. 20503.

SUBPART B--CAVE DESIGNATION

s 37.11 Nomination, evaluation, and designation of significant caves.

(a) Nominations for initial and subsequent listings. The authorized officer will give governmental agencies and the public, including those who utilize caves for scientific, educational, and recreational purposes, the opportunity to nominate potential significant caves. The authorized officer will give public notice, including a notice published in the

Federal Register, calling for nominations for the initial listing, including procedures for preparing and submitting the nominations. Nominations for subsequent listings will be accepted from governmental agencies and the public by the agency that manages the land where the cave is located as new cave discoveries are made or as new information becomes available. Nominations not approved for designation during the listing process may be resubmitted if better documentation or new information becomes available.

(b) Evaluation for initial and subsequent listings. The evaluation of the nominations for significant caves will be carried out in consultation with individuals and organizations interested in the management and use of cave resources, within the limits imposed by the confidentiality provisions of s 37.12 of this part. Nominations will be evaluated using the criteria in s 37.11(c).

(c) Criteria for significant caves. A significant cave on Federal lands shall possess one or more of the following features, characteristics, or values.

(1) Biota. The cave provides seasonal or year-long habitat for organisms or animals, or contains species or subspecies of flora or fauna that are native to caves, or are sensitive to disturbance, or are found on State or Federal sensitive, threatened, or endangered species lists.

(2) Cultural. The cave contains historic properties or archaeological resources (as described in 38 CFR 60.4 and 43 CFR 7.3) or other features that are included in or eligible for inclusion in the National Register of Historic Places because of their research importance for history or prehistory, historical associations, or other historical or traditional significance.

(3) Geologic/Mineralogic/Paleontologic. The cave possesses one or more of the following features:

- (i) Geologic or mineralogic features that are fragile, or that exhibit interesting formation processes, or that are otherwise useful for study.
- (ii) Deposits of sediments or features useful for evaluating past events.
- (iii) Paleontologic resources with potential to contribute useful educational and scientific information.

(4) Hydrologic. The cave is a part of a hydrologic system or contains water that is important to humans, biota, or development of cave resources.

(5) Recreational. The cave provides or could provide recreational opportunities or scenic values.

(6) Educational or Scientific. The cave offers opportunities for educational or scientific use; or, the cave is virtually in a pristine state, lacking evidence of contemporary human disturbance or impact; or, the length, volume, total depth, pit depth, height, or similar measurements are notable.

(d) National Park Service policy. The policy of the National Park Service, pursuant to its Organic Act of 1916 (16 U.S.C. 1, et seq.) and Management Policies (Chapter 4:20, Dec. 1988), is that all caves are afforded protection and will be managed in compliance with approved resource management plans. Accordingly, all caves on National Park Service-administered lands are deemed to fall within the definition of "significant cave."

(e) Special management areas. Within special management areas that are designated wholly or in part due to cave resources found therein, all caves within the so-designated special management area shall be determined to be significant.

(f) Designation and documentation. If the authorized officer determines that a cave nominated and evaluated under paragraphs (a) and (b) of this section meets one or more of the criteria in paragraph (c), the authorized officer will designate the cave as significant. The authorized officer will designate all caves identified in paragraphs (d) and (e) of this section to be significant. The authorized officer will notify the nominating party of the results of the evaluation and designation. Each agency Field office will retain appropriate documentation for all significant caves located within its administrative boundaries. At a minimum, documentation shall include a statement of finding signed and dated by the authorized officer, and the information used to make the determination. This documentation will be retained as a permanent record in accordance with the confidentiality provision in s 37.12 of this part.

(g) Decision final. Decisions to designate or not designate a cave as significant are made at the sole discretion of the authorized officer and are not subject to further administrative review or appeal under 43 CFR part 4.

(h) If a cave is determined to be significant, its entire extent, including passages not mapped or discovered at the time of the determination, is deemed significant. This includes caves that extend from lands managed by any Federal agency into lands managed by one or more other bureaus or agencies of the Department of the Interior, as well as caves initially believed to be separate for which interconnecting passages are discovered after significance is determined.

s 37.12 Confidentiality of cave location information.

(a) Information disclosure. No Department of the Interior employee shall disclose information that could be used to determine the location of any significant cave or cave under consideration for determination, unless the authorized officer determines that disclosure will further the purposes of the Act and will not create a substantial risk to cave resources of harm, theft, or destruction.

(b) Requesting confidential information. Notwithstanding paragraph (a) of this section, the authorized officer may make confidential cave information available to a Federal or State governmental agency, bona fide educational or research institute or individual or organization assisting the land managing agency with cave management activities. To request confidential cave information, such entities shall make a written request to the authorized officer that includes the following:

- (1) Name, address, and telephone number of the individual responsible for the security of the information received.
- (2) A legal description of the area for which the information is sought
- (3) A statement of the purpose for which the information is sought, and
- (4) Written assurances that the requesting party will maintain the confidentiality of the information and protect the cave and its resources.

(c) Decision final. Decisions to permit or deny access to confidential cave information are made at the sole discretion of the authorized officer and are not subject to further administrative review or appeal under 5 U.S.C. 552 or 43 CFR parts 2 or 4.

APPENDIX 3- **GENERAL INVENTORY PROCEDURES**

Information on caves located during the cave inventory process is to be handled confidentially and should include the following:

1. Map location or legal description.
2. Brief description of the cave (i.e., total length, type of passage, etc.)
3. Resources within each inventoried cave will be identified and a brief description written. In most cases this is done at the time of inventory. However, inspection by the cave coordinator, or another adequately trained person, may be required if it is suspected that important resources were not identified. The checklist of identifiable resources is provided below:
 - a. Recreation Resources
 - i. Evidence and extent of human visitation
 - b. Biological Resources
 - i. Evidence of bat use
 - ii. Evidence of other animal use
 - iii. Observations of invertebrates
 - iv. Naturally introduced organic material
 - v. Roots
 - vi. Fungal, lichen, moss, or algal growths
 - c. Geological Resources
 - i. Passage or features which display geological events not exposed at the surface (i.e., preserved lava flows, exposed faults, etc.)
 - ii. Secondary mineral deposits
 - iii. Unconsolidated sediments (i.e., pristine mud or silt floors)
 - iv. Re-solutional features (i.e., scallops, box work, etc.)
 - v. Cave climate and air flow
 - vi. Aesthetics
 - d. Cultural/Paleontological Resources
 - i. Artifacts which have been left in the cave 50 years or more (includes historic graffiti)
 - ii. Natural objects which were brought not the cave at least 50 years ago
 - iii. Human-caused alterations to the cave that are at least 50 years old
 - iv. Fossils embedded in rock
 - v. Animal remains (bones, middens, scat, etc.)
 - vi. Deposits rich in pollen
 - e. Hydrological Resources
 - i. Lakes, rivers, or other substantial amounts of water
 - ii. Seasonal freezing or flooding
 - iii. Cycles of entering and exiting water levels

- f. Safety/Hazards
 - i. Hypothermia
 - ii. Toxic gases
 - iii. Drop-offs, unstable entrances, cave interiors, rocks, etc.
 - iv. Diseases
 - v. Poisonous animals.
- 4. Management Recommendations (optional)

APPENDIX 4- **EYDO CAVE MONITORING PROCEDURES**

In Preparation:

- All cave visits are to be conducted by at least 3 people.
- Be sure to have several light (minimum of 3) sources: head lamp and flash light(s). Also, bring extra batteries.
- Extra or replacement pages for the cave register and pens/pencils.
- Take 5-10 *Leave No Trace* booklets on Caving to leave in the register box.
- Appropriate caving supplies for the cave you are entering.
 - A caving helmet and gloves are required. Knee pads and elbow pads are recommended for certain caves.
 - The following equipment may be necessary depending on which cave you are visiting:
 - Ropes, harnesses, ascenders, pulleys, cams, webbing, ATC, Figure 8s, etc.
 - Proper knowledge and skill for the safe use of the above items is a prerequisite for cave visitation.
- Take the monitoring form to fill out while you are there.
- Camera, satellite phone & GPS unit.
- For testing air quality: a multi-vision gas detector.
- Clothing: caves are naturally cool or cold in this area. They are also wet, sharp, dirty and muddy. Be prepared by bringing extra layers. Avoid wearing cotton; wearing synthetic clothing can keep you warmer if you get wet.
- Trash bags for outside and inside the cave.
- If you expect an extended stay in the cave (over four hours) consider taking a container for human waste (e.g., Wag Bag).
- Map of the cave.
- If you are entering a gated cave, leave a key with your supervisor.

At the Cave:

- Follow proper check-in/check-out procedure. Call into dispatch to let them know you will be entering the cave and when to expect you out. Be sure to remember to call them to let them know you are out!
- Double check you lights. Double check that you have spare batteries.
- Be sure to bring plenty of water and food with you into the cave—you may be there longer than you anticipated.
- Be sure to bring the equipment you need, particularly if you must hike to the cave (see all above equipment).

In the Cave

- Check the cave register. Replace pages, pens/pencils. Take note of the box- does it need repair or replacement?
- Review the monitoring sheet and take notes. Be especially aware of any vandalism, ladders or bolts, etc. that have been left.
- Examine the entrance and other small areas for rodents and reptiles before proceeding.
- If visiting a pristine, low visitation cave test air quality on first entrance; test other caves regularly.
- You are there with a team (of at least 3). Teamwork is important- move only as fast as your slowest person; offer help to those who need it.
- As you move through the cave, always be aware of hazards to you, your group, or other visitors to the cave.
- Clean out any garbage, flagging, or other human debris.
- Getting out always takes longer then getting into the cave. Save energy and time for your exit (and hike out).
- Avoid stepping on, bumping, or disturbing formations.

After the Cave

- Call in-check in!
- Pack out all your materials and garbage.

Back at the Office

- Properly and neatly store all caving equipment. Decontaminate all of your gear in accordance with the BLM's most recent White-Nose Syndrome Containment and Decontamination Procedures. Properly dispose of any dead batteries.
- Fill out the monitoring form and place a hard copy in the files, with a hard copy of the photos (contact sheet printing works). Be sure everything is dated and has the cave name on it.
- Place the electronic files in the appropriate folder. Again, be sure it is dated.
- Make plans for any follow up work (e.g., new register box, graffiti removal project, etc.) Pass along any pertinent information to EYDO specialists or other agencies (e.g., wildlife issues, wilderness issues, cave issues).

APPENDIX 5-
EYDO CAVE MONITORING TRIP REPORT

Cave Visited:

Date:

Participants:

Prepared by:

Please describe in detail: Use, New Damage, Vandalism or Concerns. Provide location in the cave, how recent does it, look likely method for damage (e.g., hammer, spray paint, natural rockfall, etc.).

Gate and lock:

Is a gate needed on this site?

Cave entrance or parking area:

Bolts, ladders, tree anchors, etc.:

Bats (sleeping, dead, babies):

Animals, mold, bugs, other life:

Bones, claws, feces:

Cave Formations:

Human artifacts or historic material:

Is water present, or have water levels changed:

Unusual use (fire, large groups):

Litter:

Cave register (condition, collected pages):

Photos: none taken or photo numbers: _____ - _____

GIS data collected? Yes or No

Anything else:

APPENDIX 6-
BUREAU OF LAND MANAGEMENT ELY DISTRICT OFFICE CAVE USE
APPLICATION AND PERMIT

All information provided will be kept strictly confidential by the BLM Ely District Office and would only be released to authorized officials in the event of an emergency.

- 1) Section A: List your primary use date and any additional backup dates.
- 2) Section B: List emergency contact including name, address, and phone number(s).
- 3) Section C: List trip leader's name, address, phone number, and age. Trip leader must be 18 or older. List all other group members including: names, addresses, phone numbers, and ages. Minors must have parental consent (see Section G).
- 4) Section D: Optional; List any major medical conditions of group members (in case of emergency).
- 5) Section E: Indicate purpose of visit.
- 6) Section F: Indicate whether your caving trip is sponsored by a Scouting organization or any other youth organization. Boy Scout leaders MUST provide a copy of their approved BSA "tour permit."
- 7) Section G: If any group member is a minor, a parent or legal guardian of each minor MUST sign their consent to the trip.
- 8) Cave Use Permit: All group members MUST sign the first page. Make sure all group members have read and are aware of all general permit requirements, risk awareness, special stipulations, and safety checklist items. A parent or legal guardian must sign for any group member who is a legal minor.
- 9) Cave Use Permit: Group leader MUST sign the third page to acknowledge and accept responsibility for ensuring all permit conditions are followed by all group members.
- 10) Use the Caving Safety Checklist to ensure all group members are properly prepared for the trip.
- 11) Familiarize yourself with the Post-Use Trip Report form prior to the trip. Take the form with you and fill it out as you go. Please return the form to the BLM Ely District Office within 14 days of your use date.
- 12) Make sure all group members have read and are aware of White-Nose Syndrome and BLM Containment and Decontamination Procedures.
- 13) **Submit the Cave Use Permit application with all requested info and required signatures** via regular mail, fax, or email to the BLM Ely District Office before your cave trip.



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 Ely District Office
 HC33 Box 33500 (702 N. Industrial Way)
 Ely, Nevada 89301-9408
http://www.blm.gov/nv/st/en/fo/ely_field_office.html

APPLICATION FOR CAVE USE PERMIT

Including Trip Leader, Recommended Minimum Group Size Is Three

(3) Persons

Maximum Group Size is Eight (8) Persons

A. Intended Use Date 2nd Choice 3rd Choice

B. Person(s) to Contact in Case of an Emergency:

Name, Address, Day and Evening Phone Numbers with Area Code

C. Trip Leader (Must be 18 years or older)

Age

***Names, Addresses, Phone Numbers of Other People Who Will Enter the Cave(s):

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____

D. Optional Medical Information: (Name and condition, i.e. disability, asthma, diabetes, allergies, medications)

1. _____

2. _____

- 3. _____

- 4. _____

- 5. _____

- 6. _____

- 7. _____

E. Purpose of Visit: Recreation __ Geology__ Photography __ Education __ Research __
 Other: _____

F. Group affiliated with Boy or Girl Scouts of America, Venture Scouts, etc.: __Yes ____No
*****Scout leaders must provide a copy of an approved BSA “tour permit” prior to taking groups into caves.**
 Other Youth Organizations: _____

G. Parental or Legal Guardian Consent:

*****The consent of a parent or legal guardian is required for all individuals under 18 years of age who will not be accompanied on the proposed cave trip by their parent or legal guardian.**

As part of the application to enter the cave(s) administered by the Bureau of Land Management, I **consent** to allow my child to participate in the proposed cave trip. The **trip leader** named on this application form is **delegated** the responsibility for the care and instruction of my child while he or she is in the cave(s). By **my signature** on this form, I also agree on behalf of my child to be **bound** by the permit General Conditions and any Special Stipulations that will apply to authorization for the cave visit.

CHILD'S NAME AND AGE (PRINT)	SIGNATURE OF PARENT OR LEGAL GUARDIAN
1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

THIS IS NOT A PERMIT

GENERAL REQUIREMENTS:

1. This permit neither authorizes nor implies permission for the intentional or unintentional damage or removal of cave resources, such as: archaeological and historical artifacts, natural materials or features, plant and animal life, or any item of public property. Violations of federal or state laws, general conditions or special stipulations are punishable, upon conviction, by fines up to \$100,000.00, or imprisonment not to exceed one year, or both (Federal Cave Resources protection Act of 1988, 43 CFR 8364.1, 43 CFR 8360.0-7).
2. This authorization is validated only upon signature of the permittees, and is valid only for those individuals whose signatures appear hereon.
3. Each person in the caving party will wear a safety helmet with a chin strap at all times while in the cave(s) and have in their possession at least three sources of light, one of which will be attached to the helmet. Candles, matches and cigarette lighters are not acceptable as second light sources.
4. At least one person in the caving party must be 18 years of age or older and will be responsible for the actions of younger members of the party.
5. This authorization is issued only for the time period specified on the face of this permit. It is revocable for any breach of conditions hereof, or at the discretion of the Authorized Officer of the Bureau of Land Management at any time upon notice.
6. Permittees shall exercise diligence in protection from damage of the land and property of the United States covered by this authorization, and shall pay the United States for any damage resulting from negligence or from the violation of the terms of this authorization or of any law or regulations applicable to public lands.
7. Permittees agree as a condition precedent to the issuance of this authorization, to indemnify, defend, and hold harmless the United States and/or its agencies and representatives against and from any and all demands, claims, or liabilities or every nature whatsoever, including, but not limited to, damages to property, injuries to or death of persons arising directly or indirectly from or connected in any way with the use and occupancy of the lands and cave(s) described on this authorization.
8. All materials (flagging tape, litter, etc.) taken into the cave(s) by the permittee **must be removed and properly disposed of at the end of each cave visit.**
9. All pets are prohibited from entering the cave(s).
10. Permittee agrees to enter the cave using clean and decontaminated gear. ALL cave visitors will adhere to the BLM's most current White-Nose Syndrome Containment and Decontamination Procedures upon leaving the cave.
11. The EYDO strongly recommends visitors to complete a post-use trip report following their cave visit. Please return the post-use trip report to the BLM Ely District Office within 14 days.

RISK AWARENESS

Much of the Ely District is remote, without paved roads, cell coverage, or services. If you break down or get lost it could be several days before someone finds you! Make sure someone knows where you are going and when you expect to get back.

All undeveloped caves, by their very nature, contain some safety risks. When you go caving, you do so of free will and at your own risk. Make your trip a safe and enjoyable one by being prepared and careful. Most caves contain some risks that are common to the underground environment, such as loose rocks, low ceilings, tight passages, slippery surfaces, standing water, and unstable or uneven floors. Be prepared by wearing the proper clothes and carrying the proper equipment, following safety hints, staying within your group's capabilities, keeping your group together, and using common sense. Specific safety issues described below may be encountered at any time in caves on the Ely District, but additional risks due to natural causes could have occurred since the last time the cave was visited. Cave surfaces can be slick and slippery. Areas of dripping water and mud may be encountered. Risk of falling and serious injury exists in caves on the Ely District. **Proceed with caution at all times. Do not go into an area you are not sure you can safely exit.** Parts of the cave consist of small crawlways and squeeze ways. Narrow, turning passageways can cause confusion and loss of orientation. Cavers should be aware of the risk of exposure to Hantavirus, Histoplasmosis, and Giardia. Avoid areas of rodent concentration or bat roosts. Use a dust mask or respirator for best protection. **Do not drink from cave water sources!** Risk of serious gastrointestinal infection may exist.

SPECIAL STIPULATIONS

1. This permit is not transferable without prior approval of the issuing office.
2. For visitor safety, **the recommended minimum group size for entering caves on the Ely District is three persons.**
3. Due to the confined nature of the cave, **the maximum group size allowed inside the cave at any one time is limited to eight persons**, including the group leader who must be 18 years old.
4. **Only one group of up to eight persons may go inside the cave at any one time.**
5. Whenever possible, stay on previously traveled routes while inside the cave. **Do not tread on or touch delicate formations in the cave, especially along the walls and ceilings.**
6. All equipment or material taken into the cave by visitors must be removed at the end of each cave visit.
7. **Leaving human waste or toilet paper behind in the cave is prohibited.** Take along a plastic bottle or bag if you must urinate or defecate inside the cave.
8. Overnight camping, firearms, open fires, and gas or propane lanterns are prohibited inside the cave.
9. No smoking is allowed inside the cave.

10. **You may NOT kill, disturb, or remove any geological, biological, or organic materials from the cave or mine adit.** Everything in the cave is protected by Federal Law. Suspected violations will be investigated and prosecuted.
11. **DO NOT INTENTIONALLY ANNOY OR DISTURB BATS AT ANY TIME. Avoid contact with bats and keep lights away from bats.**
12. Do not attempt to alter or remove any of the historical signatures and/or dates visible on the walls of the cave.
13. No route marking and/or other marking or defacement of the cave walls, ceilings, or floors is permitted, including using string to mark routes.
14. Do not remove, relocate, or tamper with any scientific instruments or devices that you may encounter inside the cave.



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CAVE USE PERMIT

CAVE NAME _____

PERMIT. NO. _____ USE DATE: _____

Permission is hereby granted to _____ and a party of up to seven other people as reflected by signatures below to enter the above named cave(s), located on public lands.

Authorized by:

_____ Date _____

The following signatures indicate that permittees have received and understand information provided by the BLM on risk awareness in the cave (s), and agree to comply with the General Requirements, attached Special Stipulations, and Cave Safety Checklist for this authorization:

- | | |
|----------|----------|
| 1. _____ | 6. _____ |
| 2. _____ | 7. _____ |
| 3. _____ | |
| 4. _____ | |
| 5. _____ | |

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3. Each person in the caving party will wear a safety helmet with a chin strap at all times while in the cave(s) and have in their possession at least three sources of light, one of which will be attached to the helmet. Candles, matches and cigarette lighters are not acceptable as second light sources.
4. At least one person in the caving party must be 18 years of age or older and will be responsible for the actions of younger members of the party.
5. This authorization is issued only **for the time period** specified on the face of this permit. It is revocable for any breach of conditions hereof, or at the discretion of the Authorized Officer of the Bureau of Land Management at any time upon notice.
6. Permittees shall exercise diligence in protection from damage of the land and property of the United States covered by this authorization, and shall pay the United States for any damage resulting from negligence or from the violation of the terms of this authorization or of any law or regulations applicable to public lands.
7. Permittees agree as a condition precedent to the issuance of this authorization, to indemnify, defend, and hold harmless the United States and/or its agencies and representatives against and from any and all demands, claims, or liabilities of every nature whatsoever, including, but not limited to, damages to property, injuries to or death of persons arising directly or indirectly from or connected in any way with the use and occupancy of the lands and cave(s) described on this authorization.
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11. The EYDO strongly recommends visitors to complete a post-use trip report following their cave visit. Please return the post-use trip report to the BLM Ely District Office within 14 days.

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All undeveloped caves, by their very nature, contain some safety risks. When you go caving, you do so of free will and at your own risk. Make your trip a safe and enjoyable one by being prepared and careful. Most caves contain some risks that are common to the underground environment, such as loose rocks, low ceilings, tight passages, slippery surfaces, standing water, and unstable or uneven floors. Be prepared by wearing the proper clothes and carrying the proper equipment, following safety hints, staying within your group's capabilities, keeping your group together, and using common sense.

Specific safety issues described below may be encountered at any time in caves on the Ely District, but additional risks due to natural causes could have occurred since the last time the cave was visited. Cave surfaces can be slick and slippery. Areas of dripping water and mud may be encountered. Risk of falling and serious injury exists in caves on the Ely District. **Proceed with caution at all times. Do not go into an area you are not sure you can safely exit.** Parts of the cave consist of small crawlways and squeeze ways. Narrow, turning passageways can cause confusion and loss of orientation. Cavers should be aware of the risk of exposure to Hantavirus, Histoplasmosis, and Giardia. Avoid areas of rodent concentration or bat roosts. Use a dust mask or respirator for best protection. **Do not drink from cave water sources!** Risk of serious gastrointestinal infection may exist.

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4. **Only one group of up to eight persons may go inside the cave at any one time.**
5. Whenever possible, stay on previously traveled routes while inside the cave. **Do not tread on or touch delicate formations in the cave, especially along the walls and ceilings.**
6. All equipment or material taken into the cave by visitors must be removed at the end of each cave visit.
7. **Leaving human waste or toilet paper behind in the cave is prohibited.** Take along a plastic bottle or bag if you must urinate or defecate inside the cave.
8. Overnight camping, firearms, open fires (except carbide lamps), and gas or propane lanterns are prohibited inside the cave.
9. No smoking is allowed inside the cave.
10. **You may NOT kill, disturb, or remove any geological, biological, or organic materials from the cave or mine adit.** Everything in the cave is protected by Federal Law. Suspected violations will be investigated and prosecuted.
11. **DO NOT INTENTIONALLY ANNOY OR DISTURB BATS AT ANY TIME. Avoid contact with bats and keep lights away from bats.**
12. Do not attempt to alter or remove any of the historical signatures and/or dates visible on the walls of the cave.
13. No route marking and/or other marking or defacement of the cave walls, ceilings, or floors is permitted, including using string to mark routes.

14. Do not remove, relocate, or tamper with any scientific instruments or devices that you may encounter inside the cave.

Signature of Permittee/Trip Leader

Date



United States Department of the Interior



BUREAU OF LAND MANAGEMENT

Ely District Office

HC33 Box 33500 (702 N. Industrial Way)

Ely, Nevada 89301-9408

http://www.blm.gov/nv/st/en/fo/ely_field_office.html

CAVE SAFETY CHECKLIST

Equipment:

- ___ Helmet or hardhat with sturdy chinstrap for all party members.
- ___ Electric headlamp on every helmet (so hands are free for crawling and climbing).
- ___ Three reliable sources of light (headlamp and flashlights.). Extra batteries and spare bulbs. Keep them within easy reach.
- ___ Coveralls or long-sleeve shirt & pants, leather gloves, and non-marking boots with ankle support. Knee and elbow pads are also recommended.
- ___ First aid kit & emergency space blanket.
- ___ Water and quick energy food.
- ___ Climbing rope or length of webbing (at least 25 ft.) in good condition.
- ___ Warm and/or waterproof clothing. Many caves are cold & damp. Standing water may also be encountered.
- ___ Dust mask or handkerchief.
- ___ Small backpack or gear bag.

Before you go:

- ___ Itinerary. Prior to visiting a cave, inform friends and family of your trip location and when you plan to return. Give phone numbers to call in case of emergency. Do not rely on cell phones; you will likely not have cell coverage within the cave.
- ___ Inspect and test all equipment before leaving.
- ___ Never go caving alone. Go with at least two other cavers; in case of emergency, one can go for help while one stays with the victim.

- ___ Be sure at least one member of your group has adequate caving experience.
- ___ Map & compass or GPS should be brought if you are unfamiliar with the area. Get directions or bring along someone who has been there before.
- ___ Place your car's ignition keys in a safe location near your car before entering the cave. Do not bring keys into the cave. You could lose them!

Inside the cave:

- ___ Keep your group together to avoid disorientation or separation. Never attempt to go further into a cave than a point from which you can safely find your way out.
- ___ Proceed slowly and with caution. Monitor members of your party and exit the cave before anyone becomes too exhausted or stressed to continue.
- ___ Stay within your limits. Do not use ropes or cable ladders until you have been adequately trained for vertical-entry caving. Do not jump down climbs or over obstacles. Do not climb up or down passageways that you are not sure you can get out of.
- ___ Beware of encounters with snakes, rodents, bats, insects, and other potential wildlife. Avoid areas of rodent concentration or bat roosts. Exposure to histoplasmosis is possible.
- ___ Don't enter caves that are known to be flooded or affected by seasonal water flow conditions.



United States Department of the Interior



BUREAU OF LAND MANAGEMENT
Ely District Office
HC33 Box 33500 (702 N. Industrial Way)
Ely, Nevada 89301-9408
http://www.blm.gov/nv/st/en/fo/ely_field_office.html

CAVE POST-USE TRIP REPORT:

- Condition of Access Road, Signs, and Parking/Camping Area:

- Condition of Gate & Lock:

- Condition of Adit Passage, Cave Entrance Ladder & Handholds:

- Trash or debris found (please help us by removing it):

- Water Quality in Cave: (please circle) Clear Cloudy Dirty

- Evidence of recent vandalism:

- Approx. # of Bats encountered: _____ Area(s) of cave: _____

- Injuries/accidents:

- Other issues/comments/concerns:

Trip Leader's Signature: _____ Date: _____

PLEASE COMPLETE AND RETURN THIS FORM TO THE BLM ELY DISTRICT OFFICE WITHIN 14 DAYS AFTER THE CAVE TRIP. Thank you for your assistance and commitment to the conservation of public lands!

White-Nose Syndrome



Bats with White-Nose Syndrome

The fungus *Pseudogymnoascus destructans* (Pd) is the cause of White-Nose Syndrome (WNS), a disease that has devastated populations of hibernating bats in eastern North America. Since its discovery in New York in 2007, WNS has spread rapidly through northeastern, mid-Atlantic, and Midwest states and eastern Canada. It continues to threaten bat populations across the continent. For the protection of bats and their habitats, comply with all current cave and mine closures, advisories, and regulations on the federal, state, tribal, and private lands you plan to visit. In the absence of cave and mine closure policy, or when planned activities involve close/direct contact with bats, their environments, and/or associated materials, the following decontamination procedures should be implemented to **reduce the risk of transmission** of the fungus to other bats and/or habitats. For the purposes of clarification, the use of the word “decontamination,” or any similar root, in this document entails both the 1) cleaning and 2) treatment to disinfect exposed materials.

Under no circumstances should clothing, footwear, or equipment that was used in a confirmed or suspect WNS-affected state or region be used in a WNS-unaffected state or region. Some state/federal regulatory or land management agencies have supplemental documents¹ that provide additional requirements or exemptions on lands under their jurisdiction. **There is evidence that people may carry WNS from cave to cave.** To prevent or reduce the risk of people spreading WNS throughout the United States and other parts of the world, the BLM requires the following policies and actions.

We advise that you decontaminate these items immediately (see decontamination procedures below) and store them away, and that you thoroughly wash and decontaminate any surfaces with which these items may have come into contact (e.g., car trunk).

Current Decontamination Procedures:

Before caving:

- A cave should only be entered with clothing, boots, and equipment that have been fully cleaned using the protocol below. We ask that you not take gear into a cave if that gear cannot be

thoroughly decontaminated or disposed of (i.e., if harnesses, ropes or webbing, etc. cannot be decontaminated, we advise that you not enter caves or parts of caves requiring use of this gear).

After EVERY caving trip please abide by the following steps.

National White-Nose Syndrome Decontamination Protocol - Version 06.25.2012

Under no circumstances should clothing, footwear, or equipment that was used in a confirmed or suspect WNS-affected state or region be used in a WNS-unaffected state or region. Some state/federal regulatory or land management agencies have supplemental documents that provide additional requirements or exemptions on lands under their jurisdiction.

I. TREATMENTS TO REDUCE RISK OF TRANSFERRING *GEOMYCES DESTRUCTANS*2:

Applications/Products:

The most universally available option for treatment of submersible gear is:

Submersion in Hot Water: Effective at sustained temperatures $\geq 50^{\circ}\text{C}$ (122°F) for 20 minutes.

Secondary or on-submersible treatment options (for a minimum of 10 min.) include:

PRODUCT	Clorox® (6% HOCl) Bleach	Lysol® IC Quaternary Disinfectant Cleaner	Professional Lysol® Antibacterial All-purpose Cleaner	Formula 409® Antibacterial All-Purpose Cleaner	Lysol® Disinfecting Wipes
APPROVED USES	Hard, non-porous surfaces	Yes	Yes	Yes	Yes
	Non-porous personal protective safety equipment	No	Yes (headgear, goggles, rubber boots, etc.)	No	No
	All surfaces, including: porous clothing, fabric, cloth footwear, rubber boots	Yes (Do not use on ropes, harnesses or fabric safety gear.)	No	No	No
DILUTION / TREATMENT (as per label)	Effective at 1:10 dilution (bleach : water) ^{3,4}	Effective at 1:128 dilution (1 ounce: 1 gallon of water) ^{3,4}	Effective at 1:128 dilution (1 ounce: 1 gallon of water) ^{3,4}	Effective at concentrations specified by label ^{3,4}	Effective at 0.28 % dimethyl benzyl ammonium chloride ^{3,4}

1. To find applicable addenda and/or supplemental information, visit: <http://www.whitenosesyndrome.org/topics/decontamination>
2. The use of trade, firm, or corporation names in this protocol is for the information and convenience of the reader. Such use does not constitute an official endorsement or approval by state and/or federal agencies of any product or service to the exclusion of others identified in the protocol that may also be suitable for the specified use.
3. Product guidelines should be consulted for compatibility of use with one another before using any decontamination product. Also, detergents and quaternary ammonium compounds (i.e., Lysol® IC Quaternary Disinfectant Cleaner) should not be mixed directly with bleach as this will inactivate the bleach and in some cases produce a toxic chlorine gas. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

4. Final determination of suitability for any decontaminant is the sole responsibility of the user. Use of some treatments which utilize such method need to be applied carefully, especially in confined spaces, due to inhalation or contact risks of the product. All users should be aware of these risks.

If any bats with WNS are observed in a cave or dead bats with WNS are found, please contact the BLM Ely District Office immediately!

**APPENDIX 7-
EXCERPTS USED FROM IM NO. 2010-181**

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D.C. 20240
<http://www.blm.gov>

August 19, 2010

In Reply Refer To:
6500 (230) P

EMS TRANSMISSION 08/20/2010
Instruction Memorandum No. 2010-181
Expires: 09/30/2011

To: All Field Office Officials

From: Assistant Director, Renewable Resources and Planning

Subject: White-nose Syndrome

Program Area: Wildlife, Threatened and Endangered Species, Recreation, and Abandoned Mine Lands.

Purpose: This Instruction Memorandum (IM) provides direction on how to prepare for the anticipated occurrence of White-nose syndrome (WNS) on Bureau of Land Management (BLM) administered lands nationwide.

Policy/Action: It is current BLM policy, as articulated by the “stay out, stay alive” campaign, to discourage the public from entering underground abandoned mine features on public lands, as they risk injury or death, and potentially increase the risk of transferring WNS among vulnerable bat populations.

The BLM recognizes that there are knowledge gaps concerning WNS etiology and epidemiology; however, we are committed to implementing measures to prevent and reduce the impacts of WNS. The BLM may adjust its policy on WNS as more information becomes available through ongoing monitoring and research efforts.

In the meantime, an Interagency National Response Plan (INRP) for managing white-nose syndrome in bats is being drafted, and the BLM is an active participant.

Until more detailed guidance is available, implement the BLM-WNS Interim Response Strategy (Attachment 1), which includes the following guidance:

- Coordinate and conduct outreach with appropriate internal and external stakeholders to prevent or contain the spread of WNS. Identify caves and abandoned mine features (hereinafter referred to as “sites”; refer to the definitions of caves and abandoned mine features found in Attachment 2) with important bat resources (refer to all three attachments for more detail).
- Emphasize ongoing inventory efforts of Abandoned Mine Land Program Surveys.
- Consider restricting access to caves and abandoned mines on BLM-administered lands in your state. It is suggested that BLM State Directors use a targeted approach to closure that prioritizes sites with important bat resources.
- Adhere to the current version of BLM containment and decontamination procedures (refer to Attachments 1 and 2).
- Participate in interagency groups to develop state WNS response plans that consider the INRP, as appropriate.
- Recommend locations to test for the presence of WNS at a subset of the sites that have been identified as having important bat resources and support WNS research efforts where practicable and feasible within budgetary constraints.

The BLM will continually assess the effectiveness of this policy and implement adaptive strategies, as appropriate.

Timeframe: This IM is effective immediately.

Budget Impact: The implementation of this IM is anticipated to result in costs for a variety of BLM activities, including data review and analysis to identifying caves and abandoned mines with important bat resources, disease surveillance, response planning, cave closure (administrative and physical), decontamination protocol implementation, interagency coordination, outreach, and education.

Background: WNS is a condition associated with massive mortalities of cave and mine hibernating bats and has spread at an alarming rate across the eastern United States. The fungus (*Geomyces destructans*) associated with the disease has now been reported as far west as Missouri and Oklahoma. This spread has occurred within only 3 years of the first observation of clinical signs of WNS. Mortalities at affected hibernacula in the Northeast have ranged from 80-100 percent of their hibernating bats and have affected six species of bats, including one endangered species. The fungus has also been observed on live bats in an additional three species. The BLM administers thousands of caves and abandoned mines, many of which are used by bats for hibernation or roosting.

While the disease is not known to be harmful to people, evidence suggests that the dispersal of the *Geomyces destructans* fungus, considered the primary causal agent for

WNS, can be transmitted via bats or people. Although bat-to-bat transfer of the fungus occurs, people may also inadvertently transfer the fungus from an affected site to an unaffected site, via spores on their clothing or gear, where it can then affect bats using the site.

Bat populations in the northeast have plummeted due to WNS, and state and Federal agency personnel and their budgets have been strained as they have struggled to react to this relatively new threat.

Manual/Handbook Sections Affected: None.

Coordination: This policy was coordinated with the Renewable Resources Directorate (WO-200), and the Divisions of Fish Wildlife and Plant Conservation (WO-230), Recreation and Visitor Services (WO-250), and Environmental Quality and Protection (WO-280).

Contact: If there are any questions regarding this IM, please contact Dwight Fielder, Chief, Division of Fish, Wildlife and Plant Conservation, at 202-912-7230; Andy Tenney, Deputy Division Chief, Division of Recreation and Visitor Services, at 202-912-7094; or Bill Ypsilantis, Acting Chief, Division of Environmental Quality and Protection, at 202-912-7163.

Signed by:
Bud C. Cribley
Deputy Assistant Director
Renewable Resources and Planning

Authenticated by:
Robert M. Williams
Division of IRM Governance, WO-560

2 Attachments

- 1 – BLM-WNS Interim Response Strategy (3 pp)
- 2 – BLM Containment and Decontamination Procedures (6 pp)

Bureau of Land Management
White-nose Syndrome Interim Response Strategy
August 2010

- 1. Stakeholder Coordination:** Effective disease management requires a coordinated and consistent approach to the extent feasible. The Bureau of Land Management (BLM) will coordinate with appropriate internal and external stakeholders to prevent and contain the spread of White-nose syndrome (WNS). Stakeholders may include BLM program coordinators, state and other Federal agency partners, tribes, and concerned members of the public. The BLM values partners and relies on them for most of the “on-the-ground” cave management activities that occur on BLM-administered lands. The BLM will consider this valuable coordination in developing policies and actions.

- 2. Identify Sites with Important Bat Resources:** BLM offices will utilize the best available scientific information to assess and identify sites on BLM-administered lands that have important bat resources. The purpose of this assessment is to identify sites as potential disease surveillance locations and to assess sites for closure to public entry. Best available scientific information may include, but is not limited to state/district/field office files, Federal agencies, State wildlife agencies, State abandoned mine programs, bat researchers, speleological societies and other recreational caving groups, published accounts, and local experts. Assessment of the importance of bat use at a particular site is locally subjective and should be coordinated with state fish and wildlife agencies and other stakeholders, and assessment should consider local ecological factors. Examples of factors to consider when identifying sites that have important bat resources include the potential for the species to be affected (based on what is known at the time of assessment), status of the species present, number of individuals, proximity to human populations, frequency of human entry, and timing and duration of bat use. The BLM offices will coordinate with state fish and wildlife agencies as described in 43 Code of Federal Regulations, Part 24.4 in the assessment of importance of bat resources. For sites with no previous bat inventories, the BLM offices should evaluate their potential value as bat habitat using existing information and best professional judgment.

Bureau policy generally limits the duration of temporary closure or restriction orders to 24 months or less. The BLM must also generally comply with the National Environmental Policy Act prior to closing public lands to certain uses or restricting specific uses of the public lands. For additional information, Refer to IM 2010-28, Requirements for Processing and Approving Temporary Public Land Closure and Restriction Orders.

The BLM state offices will identify a state WNS point-of-contact within 30 days of the issuance of this Instruction Memorandum (IM). The identified contact will

work with the BLM Washington and state offices in the coordination of the BLM's response to WNS including the collation and transfer of data, as appropriate. For outreach and communication purposes, states will coordinate with the Washington Office regarding which sites, if any, are proposed for closure. To assist the Washington Office in facilitating the BLM response to WNS, existing site data as described in Attachment 3, Site Feature Bat Inventory Spreadsheet, will be submitted to Jessica Rubado, Division of Fish, Wildlife and Plant Conservation, with copies to Erinn Shirley, Division of Environmental Quality and Protection, Abandoned Mine Lands Program, and James Goodbar, Division of Recreation and Visitor Services within 90 days of the issuance of this IM.

- 3. Emphasize Ongoing Inventory Efforts:** The BLM conducts inventory of Abandoned Mine Lands that collect bat presence information; states will continue these ongoing efforts.
- 4. Site Administrative and Physical Closure:** The BLM State Director will assess which, if any, sites at risk for spread of WNS will be administratively or physically closed. It is suggested that BLM State Directors utilize a targeted approach to closure that prioritizes sites with important bat resources. The BLM offices will carefully evaluate whether restricting access to caves and abandoned mines on BLM administered lands is appropriate to minimize the spread of WNS. Before recommending closure orders, managers will coordinate with land managers at other agencies and consider the effectiveness and level of public support relative to using voluntary restrictions and applying decontamination procedures.

Closure orders for sites with important bat resources will include exemptions for persons conducting search-and-rescue operations, approved WNS related monitoring, research, surveys, underground abandoned mine surveys and closures, and those authorized for activities granted by the Mining Law. The BLM offices will require decontamination procedures to be followed by all exempted parties.

- 5. Identification of Potential WNS Surveillance Locations:** The BLM state offices will recommend locations to test for the presence of WNS at a subset of the sites that have been identified as having important bat resources. To facilitate the coordination of the ongoing national interagency response effort for WNS, the BLM states are directed to identify and submit to Jessica Rubado, Division of Fish, Wildlife and Plan Conservation, the locations, if any, they recommend for testing on BLM administered land within 90 days of the effective date of this IM.

The BLM will utilize its external partners in assisting with reporting the presence of the fungus and suspected WNS afflicted bats. Examples of groups assisting with reporting information include Federal and state agencies, recreational cavers, mining claimants, field personnel, and contractors.

A number of different documents outlining protocols for surveillance and monitoring are being developed by various Federal and state groups. In addition, the surveillance working group associated with the WNS national response planning process is preparing recommendations on how to conduct these activities.

- 6. Containment and Decontamination:** The BLM offices will implement the attached BLM- WNS containment and decontamination procedures (Attachment 2) immediately for all site entries. The BLM states and district offices will collaborate with stakeholders as appropriate, including caving organizations, concessionaires, abandoned mine contractors, state agencies, and other parties to apply containment and decontamination procedures for all caves and abandoned mine feature entries. Also refer to the USFWS White-Nose Syndrome Decontamination Protocols for Researchers located at: (http://www.fws.gov/WhiteNoseSyndrome/ppt/NPS_Decontamination_Protocols_Webinar_June_9_2010.ppt)
- 7. Research:** Where practicable and feasible within budgetary constraints, the BLM will participate in and support WNS research efforts.
- 8. Outreach:** The BLM will educate its internal and external stakeholders through various forms of media and also participate in the educational efforts of other governmental and non- governmental organizations. The BLM Washington Office will create an external WNS web page to inform the interested publics of our efforts concerning WNS. An internal WNS web page will be created to share information amongst the state and district offices. The BLM will participate, where appropriate, in interagency media activities in cooperation with other organizations to heighten public awareness of WNS. A BLM WNS Communication Plan is under development.

**Containment and Decontamination Procedures
for Bureau of Land Management Administered Lands
to
Minimize the Spread of White-Nose
Syndrome in Caves and Abandoned Mines
August 5, 2010**

Since the first observation in New York State in early 2006, White-Nose Syndrome (WNS) in bats has been documented across the eastern United States (U.S.) and Canada, and most recently in Missouri and Oklahoma. The *Geomyces destructans* fungus is considered to be the primary causal agent of the mass mortality of these bats. Mortality rates at affected sites are high, typically 80 to 100 percent.

In addition to the presence of the fungus, fat reserves of bats afflicted with WNS are prematurely depleted by mid-winter, as opposed to persisting until spring. This depletion of fat reserves results in starvation, and typically subsequent death. Although bat-to-bat transmission has been the focus of transmission studies and has been found to be a significant vector for the spread of WNS, long distance jumps of WNS from New England to West Virginia could have been a result of human transmission between sites.

Recent unpublished studies have shown persistence of *G. destructans* spores on field equipment exposed to contaminated caves. Other research has shown that spores may become adhered to cave clothing, boots, gear, etc., indicating that *G. destructans* could be transported between sites. In light of this information, it is imperative that individuals who must enter caves or abandoned mines follow the containment and decontamination procedures described in Sections 3 and 5 to prevent further spread of WNS.

Note: The recommended decontamination products listed in Section 5 have been found to be effective at killing the fungus in a laboratory setting; however, research is still needed to test the effectiveness of these products in the field. We are aware that implementing these procedures requires a significant change to the historical ways surveys or other visitations have been conducted underground. However, it is our responsibility to use reasonable procedures in accordance with agency resources and other priorities to avoid being vectors of WNS.

SECTION 1: Characteristic Signs of WNS

During summer months, bats are normally active near dusk and dawn. During the winter months, bats may be active during the day when temperatures are warm and tolerable. Different bat species naturally go into varying degrees of torpor during hibernation, and if the environmental conditions are right they can arouse and exit hibernacula. Bats **may** be considered WNS-affected when:

- They are observed flying on the landscape during very cold temperatures.
- They are observed clinging to surfaces outdoors in winter.
- A white fungus is visible on their bodies, particularly on the nose and forearms. They have a dehydrated appearance.
- They are alive, but found on the ground and appear unresponsive.
- Numerous bats have been found sick or dead at a location where a large population exists.

You should not handle bats unless specifically authorized to do so. If you should observe live or dead bats that are exhibiting characteristic signs of WNS, report this immediately to the appropriate BLM office, state wildlife agency, or U.S. Fish and Wildlife Service Ecological Services Field Office (<http://www.fws.gov/offices>).

For WNS, bat and cave research decontamination procedures, refer to protocols given by the FWS at: [USFWS White-Nose Syndrome Decontamination Protocols for Researchers](#).

SECTION 2: General Guidelines to Prevent the Spread of WNS

- Avoid entry into all caves and abandoned mines, and observe closures and advisories.
- **Never use gear that was used in a WNS-affected state outside of that state. Decontaminate used gear** immediately, store gear away, and thoroughly wash and decontaminate any surfaces with which these items may have come into contact (e.g., car trunk, duffle bag, etc.).

SECTION 3: Containment and Decontamination Procedures

3.1 Caves:

The term- cave as defined in the Federal Cave Resources Protection Act includes all features whether they are known to be used by bats or not. A cave is defined under the Federal Cave Resource Protection Act as- any naturally occurring void, cavity, recess, or system interconnected passages beneath the surface of the earth or within a cliff or ledge that is large enough for a person to enter, whether the entrance is excavated or naturally formed.

Cave Entry:

- If possible, avoid cave entry.
- All clothing, footwear, safety and work equipment, and other required implements should not be used in multiple entries on the same day unless the cleaning and decontamination procedures can be performed between each entry. In situations where caves are known to be interconnected and have multiple entrances, decontamination is not required between entry at the various entrances, within the same day.

- Keep the number of items intended to be brought into a cave to a minimum.
- Prepare for cave exit by placing a plastic container near the entrance of the cave. The plastic container should contain necessary equipment for on-site decontamination. On-site decontamination equipment includes such items as plastic bags, small broom, extra clothing, footwear, and equipment.
- In some situations where caves are concentrated in a small area, states may identify logical decontamination areas that allow decontamination between cave clusters that are likely to be used by the same group of bats.
- Enter each cave with clean clothing, footwear, and equipment.
- Tyvek[®] or other disposable outerwear, rubber boot covers, and latex rubber gloves be used for each site entry in lieu of decontamination procedures for clothing. Upon exit, place items in sealable containers, to be appropriately decontaminated or disposed of off-site.
- Companion animals should be kept out of caves.

Cave Exit:

- At or near the exit of the cave, brush dirt and mud from all clothing, equipment, ropes, and any other items carried into the cave. Brushing dirt and mud off of clothing is especially important as organic material (i.e., clay soils) can prevent the chemical products from penetrating equipment, clothing, and boots, etc.
- Exposed portions of the skin (e.g., face, neck, hands, and arms) should be wiped down with disinfectant wipes. Place used wipes in a sealable plastic bag.
- Place all contaminated equipment and clothing which are to be decontaminated off-site in a sealable plastic bag and/or plastic container.
- Change into clean clothing and footwear. Place contaminated clothing and footwear into a sealable plastic bag and/or container. A clean change of clothing is required after a cave visit.
- Do not enter vehicles with contaminated clothing or equipment. Showering or bathing is required after cave visits, including when conducting multiple-day excursions to multiple sites.

3.2 Show Caves:

Work with contractors, special use permittees, concessionaires, and resource professionals to develop a site specific decontamination process for all individuals entering show caves. Some suggested actions, restrictions, or activities are:

- Educate visitors about the WNS situation. Examples of WNS educational efforts in place are available at the National Park Service's Mammoth Cave website (<http://www.nps.gov/macawhitenose.htm>).
- Close the cave to public entry during hibernation season (roughly from October 1 – May 1).
- Restrict human entry from portions of caves used by bats any time of year.

- Control visitor traffic to well-defined, physically contained pathways.
- Do not allow visitors to enter the cave with footwear, clothing, and other accoutrements that have been worn or carried into another cave or underground resource, or allow the visitor to sanitize their items prior to entry.
- Provide disposable rubber booties, overshoes, and/or Tyvek suits for visitors.
- Provide a supervised decontamination station for visitors to utilize.

3.3 Decontamination of Clothing and Equipment:

All clothing and gear used for underground site entry must be clean or be decontaminated prior to entry.

3.3.1 Submersible Gear (i.e., clothing and equipment that can be submerged without damage):

General guidance:

- Check the manufacturer's information on all of your clothing, equipment, and other items requiring decontamination to ensure that these items can withstand the application of the recommended decontamination products.
- If the effects of the decontamination procedures and products to your clothing, equipment, and other items are unknown, it is advised that these items be used only where decontamination procedures are not in effect or dedicate these items to one cave, or do not use them at all.
- In lieu of chemical treatment, the contaminated items can be boiled in water for at least 15 minutes.
- Decontamination products are listed in Section 5.

Clothing and equipment suitable for immersion:

- Wash all clothing and all suitable equipment in a washing machine or by hand at any water temperature using conventional detergents. Rinse items thoroughly and then soak items for a minimum of 10 minutes in one of the recommended decontamination products. After soaking, rinse item again and hang to dry.
- Laboratory testing has found Woolite[®] fabric detergent to be the most effective surfactant for this procedure.

Footwear:

- Rubber caving boots (Wellington-type) are recommended for cave entry.
- Boots need to be completely scrubbed free of all visible soil and organic material and rinsed at the cave entrance.

- Rubber and leather boots, including soles and leather uppers, can then be decontaminated with an appropriate decontamination product for a minimum of 10 minutes, rinsed, and air dried.

Ropes, Webbing, and Harnesses:

- To date, only Sterling rope and webbing have been shown not to be damaged by this decontamination procedure: Wash rope/webbing in a front loading washing machine on the gentle cycle using Woolite Extra Delicates detergent. After the cycle is complete, immerse the rope/webbing in a 1:128 dilution of Lysol® IC Quaternary Disinfectant Cleaner for 15 minutes. Rinse rope/webbing at least two times in clean water and allow to air dry.
- If you are using other brands of rope and webbing not mentioned above, these products have yet to be tested for integrity after decontamination. In cases where safety following decontamination has not yet been evaluated, then ropes and webbing should be dedicated to one cave or not used at all to prevent the spread of WNS.

3.3.2 Non-submersible Gear: (i.e., equipment that will be damaged by submersion):

General guidance:

- Check the manufacturer's information on all of your clothing, equipment, and other items requiring decontamination to ensure that these items can withstand the application of the recommended decontamination products.
- If the effects of the decontamination procedures and products to your clothing, equipment, and other items are unknown, it is advised that these items be used only where decontamination procedures are not in effect or dedicate these items to one cave, or do not use them at all.
- In lieu of chemical treatment, the contaminated items can be boiled in water for at least 15 minutes.
- Recommended decontamination products are listed in Section 5.

Cameras and Electronic Equipment:

- Cameras and other similar equipment that must be carried into a cave may be placed in plastic casing (i.e., underwater camera housing) or wrapped in plastic wrap where only the lens is left unwrapped to allow for proper camera function. Lysol disinfecting wipes can be used to decontaminate the plastic casing or plastic wrap.
- If no protective cover is used, electronic equipment can be decontaminated using the Lysol disinfecting wipes. Refer to the equipment manufacturer's instructions before applying any of the decontamination products.

Vehicles:

- Always remove and contain clothing and gear away from your vehicle in sealed plastic bags and storage containers with lids and wipe them with wipes prior to placing them in your vehicle.
- Properly dispose of, or decontaminate, bags and storage containers used to hold contaminated clothing and gear using the decontamination products listed in Section 5.

SECTION 4: Special Guidance for Abandoned Mines

Only those individuals who are sanctioned to conduct activities in abandoned mines may enter. Sanctioned activities authorized by the 1872 Mining Law and the BLM's regulations at 43 CFR Subpart 3809 and other BLM-authorized activities such as bat surveys and studies.

An abandoned mine is defined as a hardrock mine on or affecting public lands administered by the BLM, at which exploration, development, mining, reclamation, maintenance, inspection of facilities and equipment, and other operations ceased as of January 1, 1981 (the effective date of the BLM's Surface Management regulations codified at 43 CFR Subpart 3809), with no evidence demonstrating that the miner intends to resume mining. Abandoned mines generally include a range of mining impacts, or features that may pose a threat to water quality, public safety, and/or the environment. Adits, shafts, and tunnels are abandoned mine features.

In situations where surveys are being conducted for abandoned mine feature closures for human safety, or multiple sites are being visited in a single day, we recommend the following:

- Avoid entry if possible.
- Limit entry to that necessary to safely perform required work. For construction this is typically less than 50 feet inside the adit or shaft.
- Follow the decontamination and containment procedures outlined below between sites if feasible. If not, at a minimum follow the containment procedures and identify opportunities for decontamination at the smallest possible geographic unit to minimize risk of contamination between locations, as appropriate. These geographic units will not exceed hydrologic unit code level 5 boundaries (HUC).
- Decontamination must occur no less frequently than at the end of each day.
- Air monitors are required safety equipment for underground abandoned mine entry. Consult with the manufacturer of your air monitor prior to applying any decontaminant chemicals, to ensure that the sensors and electronic components are not compromised in any way. Follow the manufacturer's recommended procedures.

SECTION 5: Recommended Decontamination Products

The following chemical products were tested in a laboratory setting and were found to be particularly effective against killing the more resistant, spore-form of *Geomyces destructans*, as well as the hyphae:

- Lysol IC Quaternary Disinfectant Cleaner (with a minimum of 0.3% quaternary ammonium compound) or chemical equivalent—this is a concentrate which requires a 1:128 dilution (1 part concentrate to 128 parts water or 1 ounce of concentrate per gallon of water).
- Lysol All-purpose Professional Cleaner, or chemical equivalent.
- Formula 409® Antibacterial All-Purpose Cleaner (with a minimum of 0.3% quaternary ammonium compound), or chemical equivalent.
- A 10% solution of household bleach—this must be made by measuring 1 part bleach to 9 parts water (an estimate of 1:9 is insufficient).
- Lysol Disinfecting Wipes, or chemical equivalent.
- Boiling water.

Detergents and quaternary ammonium compounds (e.g., Lysol IC Quaternary Disinfectant Cleaner) should not be mixed with bleach as this will inactivate the bleach, and in some cases produce a toxic chlorine gas.

Quaternary ammonium products such as 409 and Lysol cleaner must be properly disposed of in accordance with instructions contained in the Material Safety Data Sheet for those products.

If using bleach solution, do not store dilution for more than 24 hours as the bleach will begin to break down once it is diluted. Store in opaque bottles as bleach also breaks down when exposed to sunlight.

Product guidelines should be consulted for compatibility before using any decontamination product listed under Section 3 on specific equipment.

**APPENDIX 8-
EXCERPTS USED FROM IM-2008-105**

**BUREAU OF LAND MANAGEMENT
CAVE SAFETY STANDARDS**

Visitor and employee safety is the foremost objective of the Bureau of Land Management (BLM)'s cave management program. The purpose of the BLM's Cave Safety Standards is to establish a course of action that can be followed to assure minimal risk to people (both BLM employees and the general public) entering caves on public lands. These standards consist of Cave Safety Guidelines, Search and Rescue (SAR) Pre-Planning, and Risk Assessment (previously the Job Hazard Analysis).

Most cave environments are safe for human use. A safe caving experience depends on sound decisions and staying within abilities. There may be possible risks associated with entering caves, as with any recreation activity.

Ill-prepared or uninformed personnel face the greatest risk in cave entry. Most cave accidents are avoidable with prior planning, training, and the use of the proper equipment. BLM's obligation is to educate cave entrants to the extent possible so they can make informed decisions about their own welfare. Public information and education efforts will continue within funding and manpower limits.

Frequent cave entrants are usually informed and aware of most of the inherent risks that may exist in caving activities. The BLM entered into a Memorandum of Understanding (BLM-MOU-WO 250-2007-01) with the National Speleological Society (NSS) for assistance with managing cave resources. This MOU provides for cooperation between the BLM and the NSS local chapters for the cooperative development of cave safety plans including standards for equipment, experience, and rescue procedures. The NSS's affiliated Grottos or local caving groups associated with the NSS should be contacted when information is needed on the locations and risks associated with caves in your area. The NSS has Grottos in 47 States; a list of the Grottos can be obtained from the NSS. The NSS National Office may be reached by phone at (205) 852-1300 or via email at nss@caves.org. The web site address is <http://www.caves.org>. The local caving community can assist the BLM with completing cave safety analysis and by making recommendations for personal protective measures for cave entry.

CAVE SAFETY GUIDELINES: The following guidelines will serve as a recommended course of action for BLM employees:

1. The local caving community (NSS affiliated grotto) should be contacted to assist the BLM in conducting a uniform safety analysis for each cave under BLM administration. The results of this analysis should be utilized to implement visitor awareness by informing all cave users (BLM and general public) prior to entry into the cave.

The BLM will take the necessary steps to inform and educate cave visitors of the steps necessary for a safe trip. These steps will include a list of known safety risks to inform the visitor of cave use authorizations, cave use registration stations, and cave entry signs. Some caves may require additional monitoring to reevaluate conditions.

2. A Cave Search and Rescue Workshop should be attended (or hosted by offering facilities or organizational assistance) by BLM cave specialists and other personnel responsible for cave use administration. These Cave Search and Rescue Workshops are sponsored primarily by the National Cave Rescue Commission, the National Outdoor Leadership School, National Park Service, and County or State Search and Rescue Groups. These workshops, lasting from one to eight days in length, are intended to increase rescue awareness and improve coordination between rescue personnel, organizations, and agencies.
3. Training should be provided to BLM cave specialists in climbing techniques required for the safe use of caves. BLM should take an active role by co-sponsoring and assisting in such training. Training will consist of above-ground orientation and underground experience with a qualified cave leader. Employee technical skill training and experience are essential to aid in the prevention of injuries and enable employees to better judge the skills of visitors.
4. Employees will conduct underground work in groups of three or more, never alone. This also applies to volunteers.
5. Employees will lead underground operations only after receiving adequate training and having sufficient experience in the cave to be visited.
6. Training should be provided in relevant winter, desert, or other local climatic survival techniques for employees with cave management duties. Basic survival equipment will be made available to cave specialists.
7. Due to the twilight zone of caves being utilized by wide variety of mammals, reptiles, and insects, caution should be used when entering or exiting the cave to avoid potential risk. BLM employees will be trained to avoid this risk and the proper actions to take should an employee be stung or bitten. Proper medications and first aid supplies will be made available to employees. Visitors will be cautioned when entering these areas as a part of the permitting process.
8. BLM cave specialists will receive Red Cross Basic First Aid Training or a Wilderness first aid training course as soon as possible. This can be part of the annual CPR/First Aid Training offered to all BLM employees.
9. Caving and cave rescues take place in a very fragile environment. All possible care should be taken to assure that both cavers and cave rescuers impact this environment as little as possible.
10. The *Leave-No-Trace* philosophy should be adhered to. Whenever possible, cave specialists are to use established trails, are not to touch formations or disturb Cultural or paleontological

resources, and should carry out all wastes and trash. This includes all human waste. The disturbance or discovery of cultural or paleontological resources should be reported immediately to the BLM District Manager.

11. Light sources should be helmet mounted in order to leave the hands free for negotiating the cave. It is recommended that the primary and first back-up light source be helmet mounted. The third light source is usually a flashlight on a lanyard. The lanyard should go over the shoulder and under the arm rather than around the neck.

12. In all cases of entry into caves that are heavily utilized by bats, rodents, or other animals, personnel will wear protective clothing to avoid possible health risks introduced by the animal droppings. Personnel will avoid these areas when possible.

13. When negotiating uneven or slippery cave passages, a belay should be used. Training in the proper procedure for belaying should be practiced before the trip with the device which will be used on the trip.

14. A minimal number of caves may have atmospheric conditions that are not favorable for entry. Cave atmospheres and other associated hazards will be evaluated as part of the Risk Assessment process and handled on a case-by-case basis. These caves will be posted at the entrance, and a log kept at the area office of the inherent risks present at the time of the evaluation of the cave. A periodic reevaluation will be conducted as applicable or prior to entering by a BLM employee.

15. The Boy Scouts of America have a specific program and procedures for caving. Scouts are actually required to go through a certification process with signed documents in place prior to allowing the youth to go caving. You should verify with the Troop Leader that this certification process has taken place prior to authorizing Boy Scout's use of caves.

RISK ASSESSMENT: This section identifies state-of-the-art procedures including cave pre-trip preparation, cave use, and post cave trip follow-up procedures developed to assist in assuring safety of the cave entrants. Recommended protective measures for safe caving is the main component of Risk Assessment (RA). A Risk Assessment Check List and Risk Management Worksheet (BLM form 1112-5) are found in Attachment 1.

Risk Assessment is a Bureau-wide mechanism to identify risks and recommend protective measures to ensure employee safety. All of the recommended protective measures in the RA can be applicable to all cave users.

This RA is not an all-inclusive analysis of the potential risks located within a cave and does not take the place of common sense that must be used by all persons who enter caves. The contents of the RA should be customized for local conditions/situations -- but approval authority remains the same everywhere.

Standardizing cave entry procedures and techniques reduces both the likelihood of error and the

possibility of new and unforeseen technical problems. It is expected that cave specialists will learn a set of standard procedures before adapting, tailoring, and customizing their equipment and techniques to specific locations.

SEARCH AND RESCUE (SAR) PROCEDURES / PRE-PLANNING:

This section offers simple strategies for cave search and rescue planning. A cave SAR Pre-Plan consists of a recommended course of action in the event of a caving emergency and does not need to be lengthy. Having a concise and brief cave search and rescue pre-plan can save critical time during an emergency.

While the BLM will normally be in a supportive role in cave SAR operations, it should take the lead for expediency in life or death situations or when non-Bureau SAR programs are not capable of providing cave rescue service. The Bureau should determine the sufficiency and availability of existing cave SAR programs and assist and support local authorities and cooperate with qualified cave organizations. To expedite SAR response, partnership agreements between the BLM and responsible authorities should be developed. Separately, the Bureau should take whatever action is necessary if a SAR action involves a BLM employee.

Counties with infrequent cave SAR missions often send untrained cave rescuers to conduct cave rescues. Local training is often the most important part of a cave rescue pre-plan, because it associates the SAR team with the people who are lifelong cavers.

Each BLM field office with cave resources should have a Cave Search and Rescue Pre-plan as a part of, or addendum to, a Cave Management Plan or the District's Search and Rescue Plan. The purpose of having a Cave SAR Pre-Plan in place is to save time in the event of an emergency. Personnel changes reinforce the need for a written, readily available Cave Search and Rescue Pre-Plan.

Detailed guidance on the recommended formats for cave search and rescue pre-Plans, documentation sheets for overdue, lost or injured cavers, and a cave search team debriefing report is provided on the following 10 pages. This guidance should be used as a reference source when preparing cave search and rescue pre-plans for your cave areas.

CONCLUSION: Risk management is the primary factor of consideration in the administration of wild cave resources for public use. While the BLM cannot make all caves completely safe for all users, a proactive cave safety policy will complement the Bureau's cave management program and minimize cave accidents. Standardizing caving equipment, techniques, procedures, and training will increase cave safety.

Implementing the cave safety standards discussed above can prevent most accidents; however, the ultimate responsibility for the prevention of cave accidents rests with the cave user.

The BLM is thankful to the National Cave Rescue Commission, the National Outdoor Leadership School, and the National Speleological Society for contributing towards the

development of these cave safety standards.

Search & Rescue (SAR) Pre-Plans for Caves

Importance: Pre-plans are especially important in areas with infrequent search and rescue incidents. It is important that any pre-plan is simple or it won't be used in a time of crisis. It is also important that key people (cave specialists, managers, and dispatchers) know how to quickly access the written pre-plan.

Pre-plans organize personnel and equipment for urgent incidents. They provide guidance through the initial response. For extended incidents, they are replaced by a plan drawn up during the first operational shift.

Searches and rescues are different types of urgent events. Both are emergencies since human life is at risk. The pre-plan is not supposed to provide step by step instructions for all personnel. The pre-plan is a document from the BLM resource area or district manager to his/her staff that uses the Incident Command System (ICS) to provide clear leadership and organizational guidelines in urgent situations. The document should not restate what ICS is; it is a simple document that helps organize cave rescues. Fremont County, Wyoming, uses a one page pre-plan with four pages of appendices. The Worland Wyoming BLM District uses a 20 page pre-plan that lists all local resources, item by item, and provides much more specific guidance. The pre-plan should help the BLM field office move fluidly in a time of urgency. There are two very different types of pre-plans, general and specific.

Contents of Cave Rescue Pre-plans

Cave specific SAR pre-plans which are specific to one cave.

- **Cave description:** Describes the cave, including: temperature, humidity, flood potential, and hazards. Identify specific locations in the cave where obstacles exist that require special rope work (lift or lowering systems), what kind of system is needed, and how much rope and equipment is needed for that location. Identify other special needs or obstacles such as tight restrictions, narrow or sharply twisting passage, water passages, or special communications needs.
- **Access:** GPS coordinates need to be available. Descriptions how to get to the cave in simple terms so a deputy or cave specialist can go see if anyone's there. The closest possible landing zone should be located in the event a helicopter needs to be brought in to air lift the patient to a medical facility. GPS coordinates should be given.
- **Caver parking area:** Describes how to get to the most likely spot to find an overdue caver's vehicle. It also helps rescuers find the cave in the middle of the night.
- **Special equipment:** Includes specialized gear needed for certain passages.

General - Cave SAR pre-plans describe the BLM field office's response to any cave incident. They don't contain specific cave information, but should have a simple referencing system so the general pre-plan steers the responders to documents or people with specific information. The components to consider in a general pre-plan include:

- **Search initial response plan:** Informs the Bureau manager or cave specialist who initially takes charge (Incident Commander) how to respond and who to initially involve. This should only be about a page long. It should be the first part of the pre-plan since it describes the strategy BLM will employ.

- **Rescue initial response plan:** Similar to the above, but specific to rescues.

- **Dispatcher's cave SAR "cheat sheet:"** Questions to ask the reporting party.

- **Cave rescue personnel lists:** Home phone numbers.

- 1) Internal
- 2) Local
- 3) State and Regional (have a copy of the National Speleological (NSS) Member's Manual available)

- **Cave rescue logistics**

- 1) Internal
- 2) Local (including County and State Emergency Management Coordinator)
- 3) Regional (identify the Regional Cave Rescue Coordinator by calling the NSS)

- **Medical pre-plan**

Prepare a list of local emergency medical technicians and other medical specialists who have cave training/expertise.

- **Forms**

- 1) Overdue caver questionnaire
- 2) Lost caver questionnaire
- 3) Injured caver questionnaire
- 4) Search Team debriefing sheet (maze caves need this more than others)
- 5) Master copies of cave-specific forms

- **References** (these could be kept in your Emergency Operations Center)

- 1) Manual of U.S. Cave Rescue Techniques, by Steve Hudson
- 2) Latest copy of the NSS Members' Manual
- 3) Next latest copy of the NSS Members' Manual (format alternates annually)
- 4) Any search text (e.g., NASAR Field Commander's Notebook for SAR)
- 5) ICS Plans Book (contains master ICS forms to be photocopied)

- 6) Appropriate phone books for local area and agencies

Distribution of the written pre-plan: The pre-plan should be kept in the dispatcher's notebook. It should also be posted on the wall in your Emergency Operations Center. The Emergency Operations Center is often either a room in the Sheriff's Office with a phone and a radio or the BLM field office.

Generic Cave Search Pre-Plan

Search is an emergency. Search management involves a sequence of steps that are started in order, with each step progressing until the situation is resolved.

The search management sequence is:

- 1. Pre-plan** - Be prepared. Know the hazards and resources.
- 2. Interview** - Information must be gathered from first notice. The more information, the more focused the effort can be. The investigation scales up as the search progresses and more search areas are ruled out.
- 3. Call Out** - Trained help should be enlisted. At this stage, it is time to evaluate the urgency of the situation. This will determine the size and type of response. It is critical that in-cave tasks are dealt with by experienced cavers who can make the judgment calls needed underground.
- 4. Establish the Search Area** - In a cave incident, we may consider the entire cave at the early stages, but should then establish segments within the cave and assign them priority or rank. We must not ignore the fact that the subjects may no longer be in the cave or that they may be in a portion of the cave not on the map.
- 5. Confinement and Attraction** - Once you have established the search area, it is vital that you know if the subject leaves the search area. In a cave situation it is also vital that you know if the subject moves from one segment to another. Guard the entrance(s) and maintain an accurate log of who entered and who left. Place lights with notes and other attraction devices at key cave intersections so wandering searches will stay there.
- 6. Hasty Search** - To begin active search, the best action is to quickly check out the most likely places first. Speed is the primary objective here. Check the obvious, look for clues, report conditions.
- 7. Wide Search** - The objective here is efficiency, not pure speed nor absolute thoroughness. Search the passages in order of priority segments. This allows for search of the maximum amount of cave with the cavers on the scene in the fastest time possible. The process can be repeated for increased coverage if needed.

8. Grid Search - As a last resort before suspending the mission, a grid search can be conducted. Grid searching is slow and highly labor intensive, and it is important that teams mark the territory covered in some way. You may have to mount a clean-up trip later to remove all of the notes and flagging. In a complex cave system this process could take a huge number of people an incredible amount of time.

9. Rescue/Suspension - Whatever the method used, the goal is to find the person or determine that they are not within the search area. If found, the exercise becomes a rescue or recovery operation. The options if they are not located are to expand the search area (e.g., to some other cave or some part of the cave we do not know) or to simply scale down the operation. The object is not to quit, but to scale back. The decision to scale back is a tough management decision and should be carefully documented.

10. Critique – Identify the problem areas and the efficiencies; what worked and what did not work. How can the cave search be improved the next time?

Training

Internal training begins with familiarization with the written pre-plan by dispatchers and BLM staff. A next step is having the BLM staff read appropriate parts of Cave Rescue Techniques. The staff should be comfortable with the first four chapters and aware of the rest of the book as reference material. Finally, **a simple mock cave rescue by the local SAR team may be the most valuable preparation.**

External training can be done at your site or at national seminars. National Cave Rescue Commission (NCRC) runs annual week-long cave rescue seminars and currently offers four levels of training (4 weeks total). NCRC also runs many weekend workshops. The best use of staff time may be to have an NCRC instructor offer a short workshop on your site. Inviting other local agencies to participate will help organizations coordinate and cross-train better. Other external training includes ICS training and especially, Managing the Search Function (MSF), a 40 hour NASAR course, or Managing the Search Operation (MSO), with a similar curriculum.

Risk Assessment Checklist

Employee Name: _____ Reviewed: (Employee Initial) _____

Position Title: _____ Date: _____

Area or Division: _____

Job Element	Risk	Recommended Protective Measures
Specific Job Element, Pre-Trip Preparation/ Equipment Check	Unprepared/ Equipment Failure	Before Your Cave Trip * Obtain a cave map * Know the location of physical and legal access * Locate information on risk * Tell someone where you are going and when you should return * Inspect and test equipment before using. Be sure all equipment is adequate for the cave trip
		Recommended Protective Equipment: * cave map * gate keys or combination * pencil * small tablet * three reliable independent light sources * if carbide light is a source, extra carbide and a lamp repair kit * extra batteries and bulb * hard hat with chin strap or preferably a caving or climbing helmet equipped with a light * boots * knee/elbow pads * face dust mask * gloves * fluorescent flagging * compass * small first aid kit * 20 feet of 1 inch nylon webbing * personal medication * 1-quart of drinking water * adequate quick energy food supply * large garbage bag or space blanket * small candle

Job Element	Risk	Recommended Protective Measures
		For vertical caves, vertical climbing gear and knowledge and <u>experience</u> of its proper use, cave pack. Vertical work can have extreme inherent risks!
Caving Trip	No communications with office resulting in premature launch of search/rescue effort	Leave an itinerary with your supervisor or dispatch. Information should include: <ul style="list-style-type: none"> * Cave location (and interior destination in the case of large caves) * Directions to get to the cave * Accompanying personnel * Location of extra keys or lock combinations * Expected time of exiting the cave and arrival at the office * Time when a search team should be activated * Other locations you may be found, including other caves, restaurants, etc.
	Encounters with snakes, rodents, insects, bats	<ul style="list-style-type: none"> * Use standard snake avoidance procedures * Avoid rodent concentration areas; do not disturb bat roosts * Utilize a NIOSH/MSHA approved respirator in caves having potential Hanta Virus, Histoplasmosis or other airborne hazards * Wear gloves and when necessary seal clothing to prevent entry of insects
	Lost vehicle keys.	<ul style="list-style-type: none"> * Place your car's ignition keys in a safe location <u>before</u> entering the cave * Each party member should be told the location of vehicle keys
	Bodily injury from gate operation	*Use proper lifting techniques, use caution, request help when necessary (gates should be designed to minimize these dangers)
	Lost cave gate key and/or trapping other party in cave	*After entering cave, lock gate behind you and place gate key in a safe location
	Uneven, slippery terrain when crawling, climbing and walking; loose rock/breakdown material; danger of injury from falling	<ul style="list-style-type: none"> * Sturdy hiking boots with adequate ankle support and non-marking soles * Knee pads * Elbow pads * Gloves * Hard hat with a chin strap or a climbing helmet * Move carefully with caution, so as not to dislodge loose rocks.
	Intense darkness with a danger of tripping.	<ul style="list-style-type: none"> * Have an adequate, reliable light source, move slowly * Do not exceed physical capabilities

Job Element	Risk	Recommended Protective Measures
	Getting lost and/or disoriented	<ul style="list-style-type: none"> * Sign the cave registers when entering and leaving cave areas * Use group tactics to avoid disorientation * Continually look back and establish landmarks * Flag route when uncertain of location * Carry map and compass, look for survey markers and refer to cave map * Have a minimum of one experienced caver per group of four * Stay within your <u>group's</u> ability and experience * Never attempt to go further into a cave than a point from which you can safely find your way out * Mark your trail at frequent intervals with removable markers such as reflective tape or engineer's tape * Check your back trail frequently * <u>Always</u> remove your trail markers on the way out
	Psychological problems, claustrophobia, intense silence	<ul style="list-style-type: none"> * Discuss "natural fears" with novices before entering * Work as a team, take your time, talk to group members * Provide reassurance to those in need * Escort afflicted person from cave if necessary
	Water: danger of falling in resulting in exposure accelerated hypothermia, Giardia from drinking	<ul style="list-style-type: none"> * Use caution when traversing wet areas * Don't enter caves that are known to be flooded or affected by seasonal water flow conditions or caves located in washes or canyon bottoms when weather conditions may threaten flooding * Keep up to date on local weather conditions * Don't drink from cave water sources
	Exertion/exhaustion, hypothermia, wind exposure	<ul style="list-style-type: none"> * Recommend proper physical conditioning. The group leader should inquire about people with known potentially dangerous physical conditions and treatment needs before entering the cave * Adequate clothing should be worn in layers * Quick energy foods should be consumed to keep up with calorie utilization * Avoid overexertion * The group should pace itself for the slowest member
	Breathing difficulty from dust, histoplasmosis, hydrogen sulfide (H ₂ S), Carbon dioxide (CO ₂), or other gases in some caves	<ul style="list-style-type: none"> * Avoid dusty areas when practical * Use a dust mask * Move slowly to lower respiration rate and reduce dust * Avoid known H₂S and CO₂ risk areas * Test oxygen level and other suspected gas levels with appropriate monitoring equipment * Stay alert to breathing rates in lower parts of caves

Job Element	Risk	Recommended Protective Measures
	Exposure to unsafe levels of radon gas (potential cause of lung cancer)	<ul style="list-style-type: none"> * Measure radon levels to determine acceptable exposure limits * Exposure to radon should not exceed maximum allowable rates * Document radon exposure time in log book
	Disease causing agents in rodent/bird droppings, cactus spines in rat nests	<ul style="list-style-type: none"> * Avoid rodent concentration areas and bat roosts * Wear gloves * Use a NIOSH/MSHA approved respirator
Search and rescue (getting injured out of cave)	Additional lost or injured people	<ul style="list-style-type: none"> * Refer to Cave Search and Rescue Plan * Implement Incident Command System in the event of a rescue * Attend/host cave search and rescue training on a regular Basis
Post Cave Trip Notification and Clean-up	Launch of pre-mature search effort, explosion, corrosion, dead batteries	<ul style="list-style-type: none"> * Check in with dispatcher or office. After office hours, notify supervisor by telephone * Properly store carbide to assure that water will not contaminate resulting in released gas * Charge lamp batteries or change when necessary. When charging batteries it is essential that proper ventilation is maintained and a log kept of their use. Batteries are considered a hazardous waste and should be disposed of properly * Clean all equipment and make it ready for next trip * Store equipment in a dry location * Store batteries and carbide separate from other caving equipment
Documentation of Effort to Notify Cave Users of Risks and Recommended Protective Measures	Uninformed Cave Users Exposure to Unsafe Conditions	<ul style="list-style-type: none"> * Complete Risk Management Worksheet * Document risks and safety concerns * Develop and utilize (through distribution to cave users) a Check List of the Recommended Protective/Safety Measures for a safe cave trip

APPENDIX 9 – CAVING PRINCIPLES

Caving principles center on two primary concepts: safety and conservation. Caves have unique scientific, recreational, and scenic values. These values are endangered by both carelessness and intentional vandalism. These values, once gone, cannot be recovered. The responsibility for protecting caves must be formed by those who study and enjoy them.

1. Mineral formations, stalactites, stalagmites, phenomena of crystallization, and other natural, historical, archaeological, or paleontological specimens of any kind are NOT to be touched, damaged, or removed from any cave. The only exception to this policy is through specifically authorized separate research and collection permits approved by the BLM Ely District Office, District Manager. Cave visitors need to consider caves as “natural museums” and observe, rather than handle, cave resources. Photographs and other non-touching observations that do not harm cave resources are allowed.
2. Due to confined conditions present within caves, cave resources can be easily damaged, and environments created for possible asphyxiation by camping, cooking, smoking, flares, and open fires (other than carbide lamps) and therefore are prohibited within any cave or cave entrance on the Ely District.
3. Foot traffic within caves is confined to non-delicate areas. Cave visitors should stay on established cave trails when available, and every effort should be made to prevent damage to easily trampled cave resources. If it is necessary for safety reasons to cross pristine flowstone floors, cave visitors should remove boots and proceed in stocking feet. If it is necessary to travel through areas with thick silt, mud or delicate speleothems on the floor, cave visitors need to proceed in single file and follow in established foot falls, or trails. Do not climb on formations and stay low with your head kept down in low ceiling areas to prevent damage to formations. Destruction of features simply for the sake of “pushing new leads” is prohibited.
4. Practice *Leave No Trace* caving principles, including “Pack-It-In, Pack-It-Out.” All equipment, supplies, and other materials taken into the cave by a party need to be removed from the cave by that party at the completion of the trip, including carbide residue if carbide lamps are used.
5. Many cave formations and microclimates are dependent on pristine waters. Water quality and quantity alterations may irreparably damage cave resources. Collecting these waters should be carefully considered and highly discouraged. The cleaning of anything, or the use of soap or detergent (including biodegradable) in any cave water is prohibited.
6. Delicate balances within the cave’s ecological system may be seriously upset by the introduction of human wastes. **Liquid of solid human wastes may not be left in any cave**. If you must alleviate yourself, use pee bottles or double one- gallon zip-locked bags with baking soda, and carry and properly deposited outside of the cave, well away from the cave entrance.

7. For safety concerns, a minimum group of three individuals is recommended in all caves.
8. No gum or tobacco is to be used within caves. These items allow the introduction of foreign microorganisms into the cave environment resulting in an alteration of the native environment.
9. Gloves should be worn while within cave environments as the oils in the skin may kill any active growth of cave speleothem features.
10. Do not disturb bats or other wildlife. Disruption of wildlife, for example bats and salamanders, causes them to use and waste valuable energy that would otherwise be used to sustain them during critical non-active periods.
11. Pets are prohibited from entering caves on the Ely District.
12. When going into caves in more than one area, caving equipment, boots, and clothing should be cleaned and washed to avoid transporting microbes, funguses (e.g., WNS) and other materials from one region to another.

APPENDIX 10 – CAVE RESEARCH GUIDELINES

The following guidelines will be incorporated into research permits as applicable:

1. All research conducted on the Ely District requires the submittal of a written proposal and subsequent approval of the Authorized Officer. The BLM may solicit the assistance of outside specialists in various disciplines in the vetting of cave researchers and proposal analysis. Approval to conduct research within caves on the Ely District will be made on a case-by-case basis after BLM review and acceptance of the research proposal. Proposals must justify the need for the collection of specimens or sampling of other cave resources. Animals temporarily removed from caves on the District for research purposes shall be repatriated to the source cave upon completion of research activities, as practical. Specimens removed from caves on the District as part of research efforts shall ultimately be placed in a suitable public repository capable of proper curation and permanent housing of the specimens. A uniquely numbered BLM scientific collecting permit must be obtained by the proponent prior to initiating any sampling within caves.
2. Researchers should use non-consumptive techniques, wherever possible. If it would be necessary to alter or damage cave resources to obtain useful scientific data, the researcher is required to include in the proposal an assessment of the potential for and/or level of resource impacts anticipated from the research. The researcher must evaluate the extent to which the research may affect cave biological, geological, hydrological, archaeological, and paleontological resources.
3. Researchers will demonstrate, through verifiable experience, competency for working in the cave environment. This is important for both safety of research team members and for the conservation of resources. Researchers without prior or adequate in-cave experience may be accompanied by a BLM representative at the discretion of the Authorized Officer. To minimize collateral damage to cave resources, in-cave research teams should include only those personnel necessary to accomplish research goals. This may include a BLM representative at the discretion of the agency. The in-cave research team will be adequately briefed on cave conservation techniques and potential resources occurring in the project cave. Researchers must stay within limits of designated in-cave trail, where they are established, unless permission to visit other areas is permitted by the BLM. Researchers and their team are subject to the Caving Principles policy. All in-cave team members will sign the cave permit issued to the researcher. The principal investigator is responsible for the actions of the entire party.
4. The BLM encourages peer-reviewed journal publication of scientific findings resulting from cave research conducted on the Ely District. However, because of the sensitivity of

many resources present in caves on the Ely District, locations of caves are considered proprietary. Researchers must receive guidance from the BLM regarding the level of location information that is appropriate for dissemination for each cave mentioned in scientific papers. BLM sensitive information disclosure review of all manuscripts resulting from research conducted on the Ely District is required prior to submittal for publication.

5. As a precautionary measure to minimize the potential for the spread of White-Nose Syndrome in bats into Nevada, researchers must comply with the BLM's most current White-Nose Syndrome Containment and Decontamination Procedures regarding this issue. Any changes in guidelines or protocols that may be instituted during the life of a permitted research activity will automatically require compliance by the cave researchers.
6. Research activities must not alter or remove materials from any cave that will result in degradation of the cave. An exception exists for paleontological or archaeological material that is subject to potential destruction, damage, or vandalism. Consideration will be given to research projects that enhance the overall knowledge and understanding of the cave system. Any removal of paleontological or archaeological material must be conducted by a professional who meets Standard of the Interior qualifications and with permission from the Ely District Office.
7. Research conducted within caves on the Ely District will not be allowed if it results in the depletion of any cave resource. During the proposal review process, the BLM will consider the potential for future technologies accomplishing research goals with reduced overall impact to target and/or other cave resources. Every effort will be made to avoid unnecessary publicity or advertisement that could result in increased cave visitation or vandalism, and precipitate otherwise unnecessary salvage operations.
8. Static cave resources such as archaeological, mineralogical, or paleontological material that will be moved, altered, or removed for research purposes will be photographed in-situ with an included scale prior to alteration or removal. Multiple photographs that show the relationship of such resources within the context of the undisturbed condition (position) of the object(s) will be taken such that the reference points within the cave may be relocated. To ensure that the original location of removed resources can be accurately relocated, the location will be referenced to an unobtrusive permanent survey station or other recoverable, permanent reference point in the cave. Additionally, the original location of the resource may be plotted on an existing map of the cave.

9. The Ely District Office may require that a BLM representative accompany research activities in some caves. Other specific conditions may be added as necessary to an individual research or collecting permit.

APPENDIX 11-
COLLECTION PERMIT

Permission is granted to _____ and Cooperators, _____ of (representing) _____ to collect samples of _____ from _____ while under cave permit number _____ dated _____, and further subject to the following requirements:

1. No more material or specimens will be collected than is identified above for the authorized research being conducted;
2. Materials or specimens will be collected from as unnoticeable a location in the cave as possible, to avoid adverse impacts on the scenic quality and on other natural features associated with the cave;
3. Upon discovery of any archeological resources (as defined by Public Law 96-95, Archeological Resources Protection Act of 1979) during performance of collection activities, all surface disturbance and/or collection activities associated with those archeological resources are to be ceased immediately, with no further collection activities permitted at that location(s) until additional required permits are issued;
4. A copy of any findings, reports, and/or publications resulting from the research shall be forwarded to Bureau of Land Management Ely District Office (EYDO) upon completion of such documents;
5. Upon EYDO request, representative specimens of samples or materials collected and photographs depicting their onsite collection and other affiliated research activities will be provided to the EYDO office. All materials provided should be suitable for interpretive display, and/or use for environmental education programs;
6. It is understood that all materials, samples, or specimens collected are property of the EYDO. These materials will be made available to other researchers for study and research purposes. It is the responsibility of the collector to maintain a chain of control of the materials and keep track their location at all times. The EYDO will be notified of all transfer of materials.
7. Any substances developed for commercial purposes as a result of bioprospecting or other processes will be subject to royalty payments as negotiated prior to their commercial production.

8. Other special requirements and requests.

District Manager
Ely District Office

Date

I, the undersigned, have received a copy of this document and will adhere to all requirements stipulated herein.

Signature

Date

APPENDIX 12-
GUIDELINES FOR CAVE DIGGING PROJECTS

1. All digging must be approved by the BLM Ely District Office (EYDO) prior to the activity beginning.
 - a. Proposals for digging must be submitted to the EYDO in writing and approved by the Authorized Officer.
2. Proposals should include the following points;
 - a. Location of dig and surface and subsurface maps,
 - b. Reasons for conducting the dig (geologic and physical evidence that suggests the dig and location will be productive),
 - c. An operation plan (how the dig will be conducted, including tools, and equipment, anticipated personnel, anticipated scheduling, disposal of spoils, mitigations),
 - d. Safety concerns and practices in accordance with appropriate requirements to be followed by digging participants.
3. All digging proposals will be screened for possible conflicts with other resources (i.e., paleontology, archeology, biology, resource degradation, etc.)
4. A report will be submitted to the EYDO within five days after each digging event describing the progress and any safety concerns or efforts. Any new discoveries will be reported within 24 hours. All injuries will be reported to the EYDO immediately.
5. **NO** blasting or explosive devices will be used in digging operations.
6. All new discoveries will be surveyed as they are explored. Copies of all survey notes and sketches will be made available to the EYDO within 14 days.
7. Management needs and recommendations will be discussed with the EYDO for inclusion in a management plan.