POLICIES, MANAGEMENT, AND MONITORING: PROTECTION OF HABITAT UNSING BAT GATES

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Abstract

Bat gates are used to protect a wide variety of habitat "structures" including mines, caves, and cave-like features such as concrete tunnels and abandoned military bunkers. Laws intended to preserve cave resources, historic features, or wildlife may apply to these sites. Bat gates are used as a method of keeping people away from either sensitive resources or dangerous situations.

The Federal Cave Resources Protection Act of 1988 deems the location of caves on lands administered by the departments of Interior and Agriculture as confidential. Location information may not be made public unless the *"secretary"* determines that disclosure of the location would not *"create a substantial risk of harm, theft, or destruction of cave resources."* Other acts establish restrictions for location disclosure of cultural and historic sites, endangered species, and some paleontological resources. Generally, the locations of these sites are exempt from disclosure under the Freedom of Information Act.

Whenever possible, gated sites should not be shown on maps or discussed in publications that would draw public attention and interest. Some sensitive caves are gated: (1) to control entry; (2) allow entry only during certain times of the year, or (3) under special permit. Some mines: (1) pose a threat to the public; (2) may still be active, or (3) be under valid mineral claim. The management of these sites may require special gates that can be easily opened during operations and then closed afterwards.

The location of all mines and caves should be inventoried and the locations recorded for future reference and monitoring. A number of inventory strategies are currently being used which collect various geological and environmental data. This data is invaluable when determining priority for habitat protection or closures for public safety. GIS systems are now in common use by most agencies and provide a convenient repository for this data. Making this information available to the public must take into account confidentiality provisions of Federal law.

Gates should be routinely monitored for evidence of forced entry. Many gates are located in remote areas, seldom patrolled by law enforcement, and in places where sophisticated electronic monitors are of little use. Each gate should be visited on a regular basis. If gates are found damaged, they should be repaired as soon as possible and reinforced if necessary. Regular monitoring and repair reduces agency or landowner liability if an accident were to take place and reduces the risk of resource damage.

Introduction

Bat gates are used to protect a wide variety of habitat "structures" including mines, caves, and cave-like features such as concrete tunnels and abandoned military bunkers. Laws intended to preserve cave resources, historic features, or wildlife may apply to these sites. Bat gates are used as a method of keeping people away from either sensitive resources or dangerous situations.

Determination of Significance

Federal agencies are required by the Federal Cave Resources Protection Act of 1988 to manage Federal lands in a manner which protects and maintains, to the extent practical, significant caves. Caves are deemed significant if they meet the criteria of having biological, cultural, geological/mineralogic/paleontologic, hydrologic, recreational, educational or scientific components. Virtually all Federal caves meet the criteria and are protected under the law.

Any cave located within a special management area, designated wholly or in part due to cave resources found therein, shall also be determined significant. This last category includes such areas as national monuments, special areas, research natural areas, or other areas of special interest. For the Department of Interior, any cave found within an area managed by the National Park Service, is automatically determined to be significant.

Significant caves are to be managed in a manner that protects and maintains their values, in accordance with the Act, the Code of Federal Regulations, and agency policy.

While cave protection laws apply only to natural caves, many wildlife protection laws apply to other habitats where bats are found. Federal laws provide penalties for harassment and vandalism of wildlife on public lands. Similar laws are found in many States, and apply to all lands within the jurisdiction. Since State laws vary, one should become aware of their state laws before engaging in the study or manage bat habitat. Some States require special permits or certification for the capture or handling of bats.

Purposes of the FCRPA

The Federal Cave Resources Protection Act has two purposes. The first is "to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment and benefit of all people." For this to take place it is necessary to evaluate the resource values then determine long-term management goals. For example, caves with special resource values might be protected, while capable of withstanding recreational use might be developed for directed access or remain open for "wild caving."

The second purpose of the Act is "to foster increased cooperation and exchange of information between governmental authorities and those who utilize caves located on Federal lands for scientific, educational, or recreational purposes."

The Act discusses the handling of confidential information concerning the nature and location of significant caves. 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 (Freedom of Information Act), unless the Secretary of Agriculture determines that disclosure of such information would further the purposes of the Act and would not create a substantial risk of harm, theft, or destruction of a significant cave. Other acts establish restrictions for location disclosure of cultural and historic sites, endangered species, and some palentological resources. Generally, the locations of these sites are also exempt from disclosure under the Freedom of Information Act.

No caves should be shown on maps or in publications unless they are developed for public access, and a determination has been made that disclosure of their locations is in compliance with FCRPA. Even though significant cave locations can't be disclosed to the public, there are generally few, if any restrictions, to visiting a significant cave. The exception is where caves have been gated, or access otherwise restricted for the protection of cave resources. Most National Park Service managed areas have restrictions on cave visitation, or require special entry permits.

Some sensitive caves are gated to control entry, allow human entry only during certain times of the year, or under special circumstances.

Some mines pose a threat to public safety, are still be active, or may be under valid mineral claims. The management of these sites may require special gates that can be easily opened during operations, and then closed afterwards.

The location of all mines and caves should be inventoried and the locations recorded for future reference and monitoring. A number of inventory strategies are currently being used which collect geophysical and environmental data. This data is invaluable when determining priority for habitat protection or closures for public safety. GIS systems are now in common use by most agencies and provide a convenient repository for this information. Making this data available to the public must take into account confidentiality provisions of Federal law.

Why Bats?

Man-made openings, such as tunnels and mines, frequently provide suitable bat habitat. In the United States, bats have been found inhabiting concrete bunkers built as military coastal fortifications, and even in concrete access tunnels of abandoned nuclear reactors. It is now recognized that bats will utilize nearly any man-made structure that approximates their natural habitats.

Temperature, humidity, and airflow control suitability of underground habitats. Air movement is the most important of these and has best been extensively studied in caves. The same principals of air flow, cold traps, and warm air accumulation apply to <u>all</u> underground habitats, and control their suitability for bats. When examining a site for bat suitability, this concept should be kept in mind.

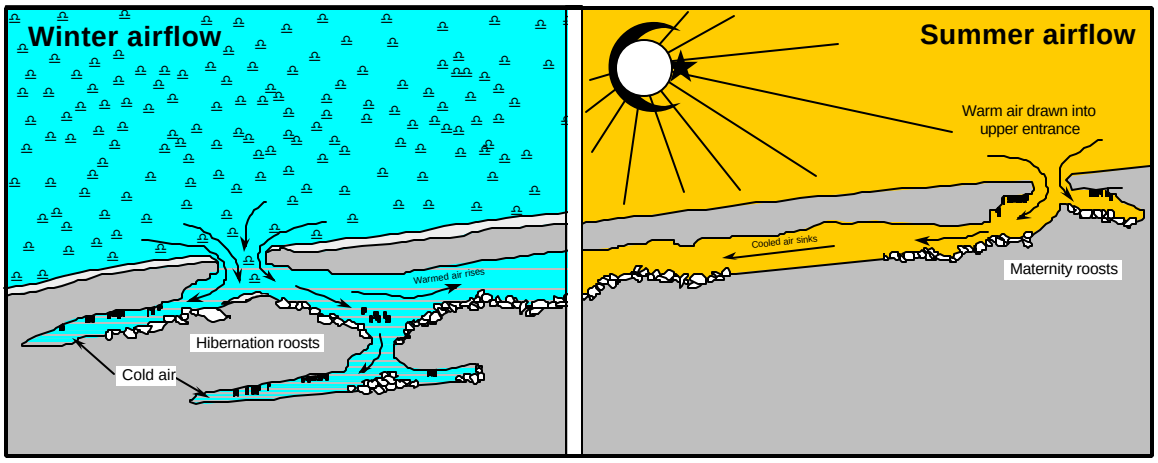
Natural processes which affect cave and mine microclimates are well documented. It should be noted however, that no two caves, or mines, are alike. Temperature, humidity, air movement, and passage configuration interact to create unique habitats. For this reason, it is important to inventory each cave or mine separately, analyze the conditions creating suitable habitat, and avoid generalizations of bat protection needs.

Roost Geomorphology and Bat Habitat

Bats have specific environmental needs for roosting, rearing young, and hibernation. By understanding how air moves through caves and mines at different seasons, it is possible to predict bat usage. Contrary to popular belief, underground temperatures are almost never stable. This is good for bats, since they have differing temperature and humidity needs at different times during their annual cycle.

Gravity, and differences in air density, cause strong air movement when a cave or mine has two or more entrances at different elevations. For example, consider a simple cave with an upslope and down slope entrance. On hot summer days, cool cave air, being more dense than warm outside air, settles toward the lower entrance. The cool air pours from the opening rustling leaves on nearby bushes and trees. Into the upper entrance is drawn warm outside air. As this air is pulled ever deeper into the cave it is cooled by the walls, continuing the process.

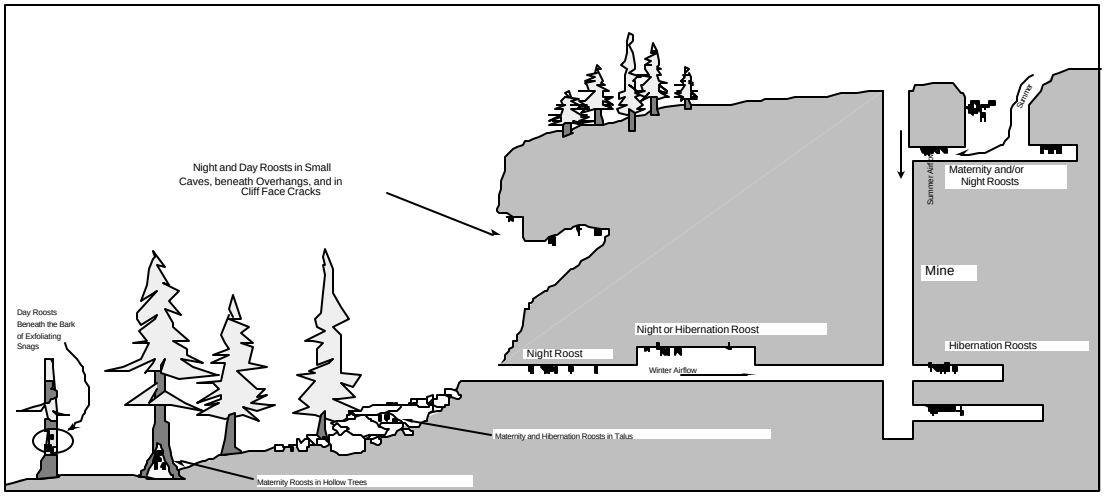
In the winter, when the underground air is warmer than that outside, it rises like smoke up a chimney. It rises as a warm moist column from the upper portal. This upward air movement is sometimes called a "chimney effect" and in the summer a "reverse chimney effect."



Other caves, particularly ones with large deep entrances, become cold traps in the winter. During cold weather, warm cave air is displaced by cold outside air that flows in along the floor. As the cold air accumulates, it cools the cave walls, and eventually causes the cave to assume the surface temperature. Caves with north or east-facing entrances are particularly prone to winter cooling. Once cold air has settled to a low point in a cave or

mine, it may take months of warm summer weather to gradually warm, if it does so at all. These cold caves are of particular importance to Townsend's big-eared bats for hibernation in the western United States.

Lava tubes with thin roofs are sometimes warmed by radiant energy from the sun, much like concrete bridge decks are warmed. These caves may provide suitable habitat maternity colonies. One of the largest *Coreorhinus* maternity colonies in Southwest Washington is found in a power line right-of-way clearing, where the sun strikes the ground during most daylight hours.



Typical Bat Roosts found in Mine and Forest Habitats

Air and Water Flow Dynamics

Alterations to the entrances, air flow dynamics, and water flow dynamics of caves can have serious implications on internal cave climate (Poulson 1975, Scharpf and Dobler 1985). Removal of vegetation in or around cave or mine entrances can alter ultraviolet light levels and change temperatures underground. More light may enter an entrance if vegetation is removed that can enlarge the twilight zone and decrease the dark zone, thus upsetting the balance between twilight and dark zone users (Scharpf and Dobler 1985).

Water often distributes organic material in caves and mines. Alterations in surface hydrology, particularly diversion of water underground, may alter atmospheric quality. Large accumulations of organic materials underground, combined with limited air movement, can cause increased levels of CO^2, which may affect the ability of bats to utilize certain habitats.

Monitoring mine temperature and humidity can be used to identify areas of suitable bat habitat.

Cave and Mine Entrance Zones

Cave and mine entrances are both sensitive and critical to underground ecosystems. Entrances are a focus of biological activity that contributes nutrients to deep cave organisms. The moderating effect of warm moist air creates microenvironments that promote growth and occupation by unusual plants and animals. It is common, for example, to find plants and animals inhabiting cave entrances that are otherwise hundreds of miles outside their normal range (Nieland, James R.). When contemplating activities for the protection of bats, it is important to remember that other resource values are involved.

Vegetation surrounding entrances helps maintain environmental conditions needed by many other animals besides bats. Shading and protection from strong winds, provided by trees, may be essential for maintaining temperature and humidity regimes necessary for bats. Vegetation surrounding roost entrances may also provide protection form predation.

Surveys

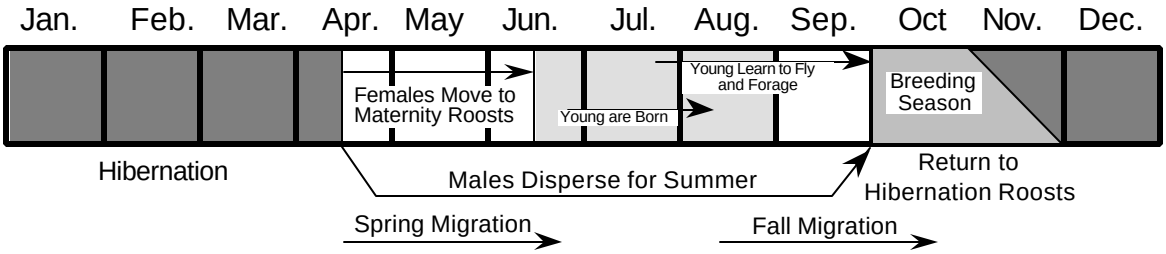
When surveying for bat use, protection of the colony is of utmost priority. Surveys must be done at the correct time of year and should emphasize non-invasive techniques. Most bat species are highly sensitive to disturbance, particularly at maternity sites. A single disturbance at a maternity site, if the females feel threatened, can cause abandonment of the roost and loss of that year's reproduction.

Looking for evidence of bat use at a mine portal

Guano is found where bats have been night roosting in the porta

Timing

Each potential roost site should be surveyed over a complete yearly cycle. Survey months are December-January for hibernation use, and mid-July to mid-August for maternity or day roosting. December and January surveys minimize disturbance because both sexes are in deep torpor and the reproductive activity is at a minimum. If weather is more mild than usual, entry into deep torpor by males and some females may be delayed. It is not uncommon for low levels of activity to continue throughout the winter, particularly during warm spells, when the bats may briefly emerge from torpor. Summer surveys are designed to locate maternity and male roost sites. In all cases, be certain to use recommended techniques to lessen disturbance and reduce the probability of abandonment of the roost site (Perkins, Mark J.).



Shown above is the yearly cycle followed by Townsend's big-eared bats in the Pacific Northwest.

Maternity Roosts

A maternity colony of bats consists of females (which may be pregnant or have young), and sometimes juveniles (May 15-September 15). The critical time for a maternity colony is after the birth of the young. For approximately 4-6 weeks, the young are non-volant and totally dependent on their mothers for nourishment. Disturbance at the roost can cause the females to abandon the roost, leaving the young to die of starvation. Disturbance can also cause young to detach from the ceiling and fall to the floor of the cave or mine. Once this occurs, the young are likely to die from starvation or predation. The female will not recover a young that has fallen (Noel, Debra C., 1993.

Hibernacula

A hibernaculum consists of a colony of bats that hibernate during the winter months. When bats hibernate, they lower their metabolism to a point that a minimum amount of energy from stored fat is required. If a disturbance causes a bat to flee, it must first increase its metabolism and body temperature. This utilizes stored fat that would otherwise be used for minimal metabolic functions. Some researchers estimate that as much as 10 percent of body fat may be consumed during each arousal. If 50-70 percent of total stored fat is needed for survival, it's apparent that hibernating bats can tolerate only a limited number of disturbances. It is common for bats to arouse from torpor, fly around briefly, then resume hibernation. These arousals may be initiated by fluctuations in temperature or humidity, or other biological triggers.

Surveys to determine bat use require special training and expertise. Please refer to the other papers presented as a part of this symposium for guidance.

Roost Protection

CAVE AND MINE GATES

Clearly, the single greatest threat to bats is human disturbance. This can come from recreational use, intentional harassment, or the closing of cave or mine entrances for safety or liability reasons.

Caves and mines are often perceived as a safety hazard or a liability risk. As a result, mining companies, agencies, or private landowners often seal a cave or mine by blasting, back filling, or gating (Belwood, 1991).

Many of these closure methods alter airflow, change underground temperature and humidity, and may block the ingress or egress of cave or mine dwelling animals (Tuttle and Stevenson, 1977). Incidents of adverse effects from cave or mine closures include the entombment of 20,000 little brown bats in New Jersey (they were later rescued), and an incident in Wisconsin in which approximately a quarter million little brown bats were nearly fumigated (Belwood, 1991).

The most acceptable method of restricting access is through the use of bat gates. Bat gates are usually constructed of horizontal angle iron bars and welded to support posts. Bars are spaced at (5 3/4 inches), wide enough for bat passage, but narrow enough to block humans. Building gates is expensive and can create unwanted impacts if improperly placed.

Gating is considered a serious undertaking and should only be done when less impacting alternatives are unworkable or have failed. (Alternative techniques include seasonal closures and signing, public education, limiting road access, and non-disclosure of cave locations.) The decision to gate a cave or mine should be made only after careful analysis and monitoring for bat use.

The survey plan should establish baseline levels of bat use of the site prior to habitat management. After the gate is installed, bat acceptance of the gate should be monitored over the next several seasons.

GATE PLACEMENT

Before placing a bat gate, the impact of gate construction on other values must be assessed. For example, it would be inappropriate to excavate for a gate if an archaeological site were to be disturbed or delicate formations or paleontological deposits would be damaged. In most cases adverse impacts can be mitigated, but only if a careful inventory is completed first.

A valid use of caves is for recreational use. The level of this activity is often based on a cave's location, ease of access, and how well it is known to the public. Discouraging recreational use of a popular cave is very difficult and gating such a site without prior public involvement may encourage forced entry attempts. Gating a popular cave is a serious undertaking and should be proposed only when it is biologically necessary.

Frequently only a portion of a large cave is used by bats. If recreational use is taking place in the cave, it may be possible to restrict access to a portion of the cave, leaving the remainder open to recreational use. Many caves are only used as maternity or hibernation sites. Outside these critical times, the bats may move to other locations. If this is the case, it may be possible to have the cave closed during critical times of the year but open for recreational use at other times. Seasonal closures may be a workable alternative and generate greater acceptance from the public.

The locations selected for placement of gates will determine both their effectiveness and acceptance by bats. Gates should ideally be placed near the edge of the dark zone, in order to reduce the chances of predation. Gates should be placed in spots that don't restrict airflow. Constricted openings should be avoided, in favor of areas of larger cross section. The gate should not restrict airflow more than the smallest passage cross section in the vicinity.

When contemplating a gate, remember to consider other wildlife that may be using the mine beside bats. Most small animals can easily pass through the gate, but some larger animals may be blocked. Some mines and caves are used by desert tortoise, while other may provide habitat for cougars or bobcats. When larger animals are present, some flexibility in locating the gate may be necessary.

Gates must be constructed to allow access to the cave or mine for monitoring. Current bat gate designs include an access doors or removable bars. The door opening is usually kept small but scaled to allow a stretcher to pass though in the event of an accident.

The American Cave Conservation Association bat gate designs have been used successfully in hundreds of locations to protect bat colonies. They features four-inch flange angle-iron bars spaced 5 3/4 inches apart and hung on vertical supports. The supports can be placed up to fifteen-feet apart, providing wide horizontal openings for bat passage. New design modifications include "half-gates" with open fly space over the top and unique "bat-chutes" (large windows which allow bats to fly through, but screened on the sides so people can't enter).

If the cave has a stream entering the entrance, or if the entrance is narrow and funnel shaped, debris could accumulate against the gate. The gate should be placed in a position that prevents twigs and leave from piling up and turning the gate into a barrier. Organic materials should be allowed to enter the cave in a natural manner, since they are important to deep-cave biota as a food source.

SIGNING

All gates should be accompanied by a sign explaining the reason the cave or mine closure, any seasonal use that may be allowed, and a source for further information. Every effort should be made to inform users of the importance of the closure, and solicit their cooperation.

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CONSTRUCTION TIMING

Gate construction should be timed when bats are absent. Construction creates noise, fumes, and increased traffic, all of which can create disturbance. Welding creates clouds of fume that may disturb bats. If disturbing bats by fumes seems unavoidable, consider installing a temporary "air dam" across the passage using plastic sheeting held against the ceiling with lengths of wood. At the end of the day, the screen can be dropped allowing normal evening bat passage.

MONITORING

Gates should be routinely monitored for evidence of forced entry. Many are located in remote areas, seldom patrolled by law enforcement, and where sophisticated electronic monitors are of little use. Each gate should be visited on a regular basis. If gates are found damaged, they should be repaired as soon as possible, and reinforced if necessary. Regular monitoring, and repair, reduces agency or landowner liability if an accident were to take place and reduces the risk

of resource damage. Signs should be checked for damage and replaced if worn or vandalized.

Vandals knocked this sign down at McDowell Cave in Missouri. Sometimes it is better to place the sign behind the gate where it is out of reach.

Monitoring of bat use is important to determining the effectiveness of gating. The least disturbing method is to conduct an exit count at the entrance to the roost. This method is only valid during the season when the bats are active and under acceptable weather conditions. All potential entrances to the roost must be observed simultaneously. The observers should be stationed so as not to block or disturb the bats upon their emergence (Kingsley et al, 1991).

Back-lighting the emergence with the western sky allows the bats to be silhouetted as they exit. If this is not possible, place a white sheet near the entrance to enhance visibility as the bats emerge. Night vision equipment with an infrared light source can also be used. White or red filtered lights should never be directed into the entrance. However, a low-intensity white light placed above the entrance and shining away from it may be used (Kingsley et al, 1991).

In the summer, roost entrances should be monitored from a half hour prior to dusk until the emergence activity has waned.

Surface Activities

Logging, road building, mining, slash disposal, and water diversion may create adverse impacts to roost habitats. Surface activities may create changes in microclimate and affect suitability for bat occupation.

The following mitigations may help prevent damage to roost habitats:

- Limit use of heavy equipment above or in the vicinity of the roost or over the course of a cave or mine, if there is potential for damage.
- Retain of vegetation in the vicinity of a roost site to protect the entrance micro environment.
- Avoid alteration of entrances or their use as disposal sites for slash, spoils, or other refuse.
- Limit management activities near a roost site when the site is occupied by bats.
- Avoid diversion of surface drainage into mines or caves.
- Avoid blasting within 1/4 mile of roost sites when occupied by bats.

PHYSICAL DISTURBANCE

Caves share with other discrete habitats a vulnerability to trampling and physical disturbance and have a much lower human carrying capacity than most surface environments. Small passages suffer greater disturbance than large passages because a greater percentage of small passage area is affected. Besides bats, woodrats and pikas will abandon caves if disturbed. (Senger and Crawford 1984).

ROAD CONSTRUCTION

Roads can cause siltation when constructed near caves (Aley and Aley 1984). Roads have been constructed directly over lava tube caves with thin ceilings that are disruptive to cave inhabitants (Scharpf and Dobler 1985). A cave in San Juan County, Washington, was broken into during road construction. In addition to being directly damaged, the cave was then used for ditch drainage that introduced road oil and sediment into the cave (Nieland 1985). Similar instances have occurred on the Gifford Pinchot National Forest, the Modoc National Forest, and the Deschutes National Forest. Breaking through cave or mine roofs, can cause changes in temperature, airflow, and humidity that may adversely impact bats.

Road construction that poses no direct danger to caves or mines may, nevertheless, pose an inadvertent threat. Roads constructed for timber harvest and other reasons may make secluded caves more accessible to the public that may increase the chance for human disturbance (Scharpf and Dobler 1985).

CLIMATE

Any activity that affects the climatic quality of a cave or mine should be avoided. Removal of vegetation over a cave, in cave or mine entrances, or alteration of entrances can cause disturbance of internal climate and light levels (Poulson 1975, Tuttle and Stevenson 1977, Wauer 1980, Senger and Crawford 1984, Nieland 1985, Scharpf and Dobler 1985, U,S. For. Ser. 1986).

LOGGING

Logging is a common practice above and around caves in rural areas. Many logging related activities are potentially detrimental to roosting habitats. These

include the removal of vegetation above or around entrances, road building over a cave or entrance, or burning slash in cave or mine entrances (Nieland 1985a). Logging residue left in entrances may deplete oxygen concentrations, rendering habitat unusable. (Stringer et. al. 1991)

Slash burning around cave or mine entrances can be deadly to cave dwellers if the smoke is drawn into the cave (Tuttle and Stevenson 1977, Nieland 1985). Controlled burns can fill a cave with smoke and change surface vegetation and nutrient dynamics (Stringer et. al. 1991). There is evidence to indicate that bats inhabiting caves on U.S. Forest Service land were adversely affected when logging and broadcast burning were conducted in the vicinity of a cave (Nieland 1985).

Logging practices should not be conducted over caves or within 400 meters of any cave or mine before the site has been evaluated and appropriate mitigation measures developed. Protection measures may vary depending on size, aspect, and location of entrances. Logging can cause thin cave ceilings to collapse and may rob soil of nutrients or cause alterations in microclimate in and around caves. Activities that constitute logging include the removal of trees or vegetation, timber salvage, firewood cutting, and the burning or dumping of slash in or near cave entrances or above cave systems (Senger and Crawford 1984, Nieland 1985, Scharpf and Dobler 1985, Beck-stead 1992).

MINING

Mining can have devastating impact on bat colonies. Mining includes exploration for, and the removal or extraction of, minerals, fuels, rock, water, or other materials. Any alteration of existing air or water movement can have impacts on bat colonies. A careful analysis should be undertaken prior to conducting any mining operations or alterations on the surface near mine portals. These should be considered in determining mitigation measures to protect listed or otherwise protected wildlife species.

ROADS

Roads should be built to avoid passing over caves or coming near entrances. Roads should be designed to minimize erosion and to prevent alterations in microclimate or (see logging buffer above) the flow of water into or around caves (Wauer 1980, Aley and Aley 1984, Nieland 1985, U.S. For. Ser. 1986, Beckstead 1992). Other impacts may include compacted soils, paving, or any other activities that contribute to the alteration of water percolation above and into caves (U.S. For. Ser. 1986).

POLLUTANTS

Pesticides, herbicides, fertilizers, and other substances that are detrimental to either vertebrate or invertebrate animals should not be used in the vicinity of bat roosts, within a cave's watershed, or within the watershed of streams that serve cave systems (Nieland 1985, U.S. For. Ser. 1986, Beckstead 1992). Other pollution

sources that should be kept away from cave watersheds include sewage, septic tanks, and landfills (U.S. For. Ser. 1986).

Bats

Caves or mines that are used by bats require stringent protection. Since entering a cave or mine to determine bat use can, in itself, cause disturbance or abandonment, those suspected of bat use should be professionally surveyed for bat suitability and use.

The following recommendations involve eliminating disturbance during critical times and should be applied to caves with suspected or actual bats use. They are intended to complement other cave management recommendations (Poulson 1975, Brady 1981, Nieland 1985, Perkins 1985a, Perkins and Levesque 1987, Senger 1987, Sheffield et. ai. 1987, Ramey 1991, Beckstead 1992):

- *Caves that possess maternity colonies should be closed from 1 May through 30 August.*
- *Caves that possess hibernacula should be closed from November 15 through April 15.*
- *Cave closure for hibernacula and maternity colonies should include a closure buffer of 300 feet.*
- *Restrict access by removing or obliterating jeep and foot trails. Re-routing or closing roads is a useful and effective means of deterrence.*

Signs and Gates

Options for closing caves during critical times include the use of signs, fences, and gates (Brady 1981, Senger 1987), although gates should be considered a last resort (Senger and Crawford 1984) and used only when wildlife is threatened (Senger 1987).

Signs may be adequate to prevent disturbance. A sign might attract attention so it may be best to place it inside the entrance to the cave. The signs should be durable, vandal proof, and be placed so that airflow and egress or ingress is not impeded. The sign must be readable and obvious. Signs should include any accompanying legal consequences as a result of cave entry (Brady 1981).

Gates are an extreme form of deterrence and should be used as a last resort (Senger and Crawford 1984, Senger 1987). Successful gating is an exact science and improper gating has resulted in the prompt abandonment of bats (Brady 1981). Cave disturbance levels that dictate the use of gates are serious situations. Those considering gating as a management option or gating any cave that has bat use should contact Bat Conservation international, and the American Cave Conservation Association, for assistance, designs, and guidance with gating .

There are differing schools of opinion about whether to list bats as the reason for cave closures (Brady 1981, Nieland 1990). Levels of disturbance and whether disturbance appears malicious or accidental may influence those decisions. Contact Bat Conservation International and the American Cave Conservation Association for current guidelines on this issue.

Confidentiality

The Federal Cave Resources Protection Act establishes standards for the handling of confidential information concerning the nature and location of significant caves. 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 (Freedom of Information Act), unless the Secretary of Agriculture or Interior determines that disclosure of such information would further the purposes of the Act and would not create a substantial risk of harm, theft, or destruction of a significant cave [cave resources].

Specific information concerning significant caves will not be made available to the public. This information will be treated as confidential and secured in such a manner as to prevent access by non-authorized individuals. Regulations make it illegal for Federal employees to disclose the locations of significant caves. Information concerning significant caves may be made available only under the conditions noted in the preceding paragraph.

Similar rules for disclosure concerning mine locations do not exist, nor do these regulations apply to state, or privately owned lands. Biologists are, however, encouraged to safeguard location information to minimize the likelihood of encouraging recreational visitation.

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Jim Nieland is the Region-6 cave management specialist for the US Forest Service. He has a background in cave and bat resource management, including an active interest in caves of the northwest, which he has inventoried and surveyed since 1965. His experience includes drafting implementation regulations for the Federal Cave Resources Protection Act of 1988, and is currently working with a Bat Taxa Team, writing survey and management protocol for the Northwest Forest Plan. He is a frequent organizer and presenter at cave management seminars, most recently culminating in a series of five bat gating field sessions. He has a background in general contracting, leading to either the design or construction of 105 bat gates in the last four years. He serves as the secretary and a board of director of the American Cave Conservation Association. He was recipient last year of the National Speleological Society's cave conservation award.

Appendix

FEDERAL CAVE RESOURCES PROTECTION ACT OF 1988

.....

Public Law 100-691
100th Congress

An Act

To protect cave resources on Federal lands, and for other purposes.

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

SECTION 1. SHORT TITLE.

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

SECT. 2. FINDINGS, PURPOSE, 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, educational, 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 man-made. 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 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 "speleo-them" means any natural mineral formation or deposit occurring in a cave or lava tube, including but not limited to any stalactite, stalagmite, helectite, cave flower, flowstone, concretion, drapery, rimstone, or formation of clay or mud.

(8) **SPELEOGEN**. -- The term "speleo-gen" 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 this 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. Those 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 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 parsons or 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; and

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

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 significant cave from destruction by vandalism and unauthorized use.

SECT. 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 at 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 manner in which such collection, removal, or associated activity is to be performed must be provided.

(2) the secretary may issue a permit pursuant to this subsection only if 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 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, or to carrying out activities associated with such collection or removal, from any cave resource located on 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.

SECT. 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, barters 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 section (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.

SECT. 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 was appealed within such 30-day period, within 10 days after court has entered a final judgment in favor of the Secretary under subsection (b),

the Secretary will notify the Attorney General and the Attorney General shall bring civil action in an appropriate United States district court to recover the amount of penalty assessed (plus costs, attorney's feet, 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.-- Title 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 subpoenas and impose sanctions.

SECT. 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 or 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) 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 waters of any rivers or stream or over any ground water 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 the 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.

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Approved November 18, 1988.

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LEGISLATIVE HISTORY--H.R. 1975:

HOUSE REPORTS: No 100-534 (Comm. on Interior and Insular Affairs).
SENATE REPORTS: No. 100-559 (Comm. on Energy and Natural Resources).
CONGRESSIONAL RECORD, Vol. 134 (1988)
Mar. 28, considered and passed House.
Oct. 21, considered and passed Senate, amended. House concurred in Senate amendment.

Part 290-CAVE RESOURCES MANAGEMENT

Sec.

AUTHORITY: 16 U.S.C. 4301-4309; 102 Stat. 4546.

SOURCE: 59 FR 31152, June 17, 1994, Unless otherwise noted.

§290.1 Purpose and Scope.

The rules of this part implement the requirement of the Federal Cave Resources Protection Act (16 U.S.C. 4301-4309), hereafter referred to as the "Act". The rules apply to cave management on National Forest System lands. These rules, in conjunction with rules in part 261 of this chapter, provide the basis for identifying and managing significant caves on National Forest System lands in accordance with the Act. National Forest System lands will be managed in a manner which, to the extent practical, protects and maintains significant cave resources in accordance with the policies outlined in the Forest Service Directive System and the management direction contained in the individual forest plans.

§290.2 Definitions

For the purposes of this part, the terms listed in this section have the following meaning:

Authorized officer means the Forest Service employee delegated the authority to perform the duties described in this part.

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 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 opening which is an extension of the cave entrance or which is an integral part of the cave.

Cave resources mean any materials or substances occurring in caves including, but not limited to, biotic, cultural, mineralogic, paleontologic, geologic, and hydrologic resources.

National Forest System Lands means all national forest lands reserved or withdrawn from the public domain, acquired through purchase, exchange, or donation, national grasslands and land utilization projects, and other lands, waters, or interests administered by the Forest Service.

Secretary means the Secretary of Agriculture.

Significant cave means a cave located on National Forest System Lands that has been determined to meet the criteria in §290.3 (c) or (d) and has been designated in accordance with §290.3 (e).

§290.3 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, or recreational purposes, the opportunity to nominate caves. The authorized officer shall give public notice, including a notice published in the FEDERAL REGISTER, calling for nominations for the initial listing and setting forth the procedures for preparing and submitting the nominations. Nominations for subsequent listing will be accepted from governmental agencies and the public by the Forest Supervisor where the cave is located as new cave discoveries are made. Caves nominated but not approved for designation may be renominated as additional 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 caves and cave resources, within the limits imposed by the confidentiality provisions of §290.3 (c) and (d).

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

(1) Biota. The cave provides seasonal or yearlong habitat for organisms or animals, or contains species or sub-species of flora or fauna 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 defined in Parts 800.2 and 296.3 of this chapter respectively, or in 16 U.S.C. 420, *et seq.*) or other features included in or eligible for inclusion on 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, represent formation processes that are of scientific interest, 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 or scientific information.

(4) *Hydrologic.* The cave is a part of a hydrologic system or contains water which 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) *Specially designated areas.* All caves located within special management areas, such as Special Geologic Areas, Research Natural Areas, or National Monuments, that are designated wholly or in part due to cave resources found therein are determined to be significant.

(e) *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) of this section, the authorized officer shall designate the cave as significant. The authorized officer will notify the nominating party of the results of the evaluation and designation. Each forest will retain appropriate documentation for all significant caves located within its administrative boundaries. At a minimum, this 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 §290.4.

(f) *Undiscovered Passages.* If a cave is determined to be significant, its entire extent on federal land, including passages not mapped or discovered at the time of determination, is deemed significant. This includes caves that extend from lands managed by any other Federal agency into National Forest System land, as well as

caves initially believed to be separate for which interconnecting passages are discovered after significance is determined.

(g) *Decision Final.* The decision to designate or not designate a cave as significant is made at the sole discretion of the authorized officer based upon the criteria in paragraphs (c) and (d) of this section and is not subject to further administrative review of appeal under Parts 217 or 251.82 of this chapter.

§290.4 Confidentiality of cave location information.

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

(b) *Requesting confidential information.* Notwithstanding paragraph (a) of this section, the authorized officer may make confidential cave information available to Federal or State governmental agencies, bona fide educational or research institutes, or individuals or organizations assisting the land management agencies with cave management activities. To request confidential cave information, such entities shall make a written request to the authorized officer which 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. The decision to permit or deny access to confidential cave information is made at the sole discretion of the authorized officer and is not subject to further administrative review or appeal under 5 U.S.C. 552 or parts 217 or 251.82 of this chapter.

§290.5 Collection of information.

The collection of information contained in this rule represents new information requirements as defined in 5 CFR 1320, Controlling Paperwork Burdens on the Public. In accordance with those rules and the Paperwork Reduction Act of 1980 as amended (44 U.S.C. 3507), the Forest Service has received approval by the Office of Management and Budget to collect cave nomination information under

clearance number 0596-0123 and confidential information under 0596-00122. The information provided for the cave nomination 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 (16 U.S.C. 4304).