
Prepared by Anthony Kerwin, Wildlife Biologist

Photo by Norm Barrett, Wildlife Biologist, Rogue/Siskiyou National Forest

Abbie Jossie
Field Manager, Grants Pass Resource Area
# TABLE OF CONTENTS

I. Background .................................................................................................................................. 3

II. Life History .................................................................................................................................. 4
   - Habitat Associations .................................................................................................................. 4
   - Roosting Ecology ....................................................................................................................... 4
   - Foraging Behavior, Habitat, and Diet ....................................................................................... 6
   - Reproduction and Development ............................................................................................... 6
   - Behavioral ecology .................................................................................................................... 7

III. Threats ......................................................................................................................................... 7

IV. General Management Direction for Townsend’s Big-eared Bat Roost Sites ......................... 8

V. Grants Pass Resource Area Sites ............................................................................................... 10
   - Oak Mine .................................................................................................................................. 10
   - Gopher / Baby / Lamb Mine ..................................................................................................... 12
   - Tip Top Mine ........................................................................................................................... 13
   - Jewett Mine Complex .............................................................................................................. 15
   - Pickett Mines ............................................................................................................................ 16
   - No Name Cave / Mud Cave ...................................................................................................... 17
   - Additional Roost Resources ...................................................................................................... 18

VI. References and selected literature: ........................................................................................... 19

Appendix A. Cave Gating Criteria ................................................................................................. 22

Appendix B. Federal Cave Resources Protection Act of 1988 ....................................................... 29
I. Background

The Medford District BLM Resource Management Plan (RMP) calls for development of standards and guidelines (RMP p. 57), and management plans of occupied sites of Townsend’s big-eared bats (RMP p. 53). There are eleven sites that are known roosts for Townsend’s big-eared bats in the Grants Pass Resource Area, and 10 or more additional sites that are likely to provide roosting habitat for some period during the year. These sites were discovered during general surveys for bats by Southern Oregon University professors Steve Cross, Ph.D. and contract surveyors, as well as by BLM wildlife biologists during bat surveys and general surveys for landscape management projects. This plan addresses six sites in detail and also provides management direction for other known or newly discovered sites.

Objectives for this plan include:
1) Compile general information on life history of Townsend’s big-eared bats;
2) Compile what is known (and unknown) about the six sites detailed in this plan;
3) Compile what is known about the use history of these sites;
4) Recommend general and site-specific land and resource management strategies that provide for maternity and hibernacula habitat for this species; and
5) Provide a tool for wildlife biologists to use for interdisciplinary team work on projects within the vicinity of known sites and potential habitat.

Information on the biology of the species was garnered from a variety of publications, predominantly from the Species Conservation Assessment and Conservation Strategy for the Townsend’s Big-eared bat from the Idaho Conservation Effort (Pierson et al. 1999) and the Western Bat Working Group Species Account for Townsend’s Big-eared bat (*Corynorhinus townsendii*) (Sherwin and Piaggio 2005). These two documents include a comprehensive compilation of information on the species. Specific citations to other literature are provided as appropriate.

Townsend’s big-eared bats, *Corynorhinus townsendii*, are an Oregon state listed and BLM Sensitive species (BLM Special Status Species website). As such, under the BLM special status species policy (Manual 6840), BLM is required to manage the species so as to prevent it from trending toward the need for listing under the Endangered Species Act of 1973 (as amended). This species is designated as “sensitive” for many reasons. The primary factor affecting this species is loss of suitable roosting habitat and disturbance to roosting sites (Tuttle, 1979; McCracken 1988; Perkins 1990).

Anthropogenic disturbance is another important factor in health of Townsend’s big-eared bat colonies. Several studies have shown a decrease in colony populations correlated with increased visitation rates (Graham 1996; Barbour and Davis, 1996; Pierson and Rainey 1996). Negative effects of anthropogenic disturbance can be exacerbated by high roost fidelity, longevity and low reproductive capacity (Pierson et al. 1999). Disturbance can occur either intentionally, such as would occur with renewed mining at a roost site, or unintentionally such as through recreational caving. In any case, loss of roosting habitat has been cited as likely having the primary impact on bat populations throughout the World, including within the United States (Merlin Tuttle,
personal communication 2006). Pierson and Piaggio (2005) state that, “In general, the long term persistence of North American bat species is threatened by the loss of clean, open water; modification or destruction of roosting and foraging habitat; and, for hibernating species, disturbance or destruction of hibernacula.”

Townsend’s big-eared bats, *C. townsendii*\(^*\), are composed of five subspecies. *C. t. pallescens* and *C. t. townsendii* are the two subspecies found in Oregon. Populations in the western part of the state are considered to be *C. t. townsendii*. Populations in the remainder of the state contain an intergradation of both subspecies.

Townsend’s big-eared bats can be distinguished from all other vespertilionid species by the combination of prominent bi-lateral horseshoe-shaped lump on the nostrils, and large ears. Their ears are obvious when erect, but they can be difficult to see when animals are in torpor or hibernation. Close examination shows that the ears are curled tightly against the top of the head in the shape of a ram’s horns. This can result in misidentification of the species.

Townsend’s big-eared bats are a long-lived and slow reproducing species. Adults give birth usually to one young per year. The longevity record is 21 years, 2 months. There are only seven known significant maternity colonies documented in the state. This management plan evaluates the two significant sites that occur on the Medford District, the Oak Mine site, discovered in 2002, and the Jewitt Mine Complex. Chapman Creek Cave is also a significant maternity colony (Steve Cross, personal communication 2007), but is not included in this plan because there is little to no information available in the Grants Pass Resource Area files.

### II. Life History

**Habitat Associations**

Townsend’s big-eared bats occur in a wide variety of habitats. Its presence is strongly correlated with the availability of caves or cave-like roosting habitat, such as old mines, bridges, buildings and other man-made structures and rarely in tree cavities. It is found throughout Oregon and is generally considered to be a non-migratory species, although short range movements are common.

It generally roosts in cave environments which have different microclimate characteristics for maternity and hibernacula sites.

**Roosting Ecology**

Townsend’s big-eared bats has been observed to have a high roost fidelity at least in areas where roost availability is low (Sherwin and Piaggio 2005) such as southern Oregon. Humphrey and

\(^*\) The taxonomy for this species has been reviewed and it has been accepted that *Corynorhinus* should be considered to be a separate genus from the Palearctic taxa of *Plecotus*. The Palearctic is generally defined as the European arctic south into supra-Saharan Africa, west into the British Isles, and east through the Koreas into temperate China and Japan.
Kunz (1976) noted that 80 percent of bats remain at or return to the same hibernaculum. It has also been observed that females show high roost fidelity, returning to the same maternity roost each year. Recent research has shown that there is a wide variation in use of alternate roost sites, and between hibernacula and maternity colony periods (Sherwin et al. 2003). It may be difficult to determine use of a site by small colonies or individuals as small numbers can be difficult to detect from limited capture efforts, visually during site surveys, or by acoustic methods if the site is not used on a regular basis. Additionally, difficulty in detection is exacerbated by the soft echolocation call of this species, which cannot be detected unless the bat passes very close to an acoustic detector.

*C. townsendii* is generally a colonial species. Unlike many cave dwelling species that take refuge in crevices, they often form highly visible clusters on open surfaces, and relatively near the cave opening in the “twilight” area of the cave. This makes them extremely vulnerable to disturbance. Colony size can range from a few individuals to many hundreds of animals.

**Maternity Roosts**
Roost microclimate temperatures appear to be a critical site variable for suitability as a maternity roost. Other factors can include roost dimensions, light quality and air flow. Maternity roosts are generally warm and in an area of the cave that holds heat. This helps maintain high body temperature which aids in development of the fetus and young, and aids lactation, reducing energetic costs of these activities. Maternity colonies often form tight clusters, which promote the sharing of body heat and again, reducing energetic costs. These roosting habits can increase the risk of disturbance, threatening entire colonies. This factor is not as much of a risk to most of the Pacific Northwest’s tree-dwelling species, which do not form large colonies and do not generally roost in exposed locations.

**Hibernacula**
Hibernacula can be occupied by one or many bats. Roosts used for hibernating must also have suitable microclimate variables. Variables include stable, cold temperatures and moderate airflow that do not fluctuate greatly with changes in outside conditions. Undisturbed hibernacula are critical for survival. Research has shown that weight loss during hibernation is roughly 55 – 57 percent of body mass (Humphrey and Kunz 1976). It has also been shown that a bat roused from hibernation consumes approximately 60 days of fat reserves, thus disturbance can result in low survival rates during hibernation (Brady 1982; Speakman and Thomas 2004).

**Summer Roosts of Males and Non-reproductive Females**
Microclimate conditions in summer roosts are not as critical as those in maternity roosts or hibernacula. Males and non-reproductive females use a variety of structures (caves, abandoned mines, bridges, tree cavities etc). Males and non-reproductive females may use alternate roosts and likely use a wider variety of roosts during a single summer.

**Night Roosts**
Although large aggregations of Townsend’s big-eared bats have been sighted under bridges, (Pat Ormsbee, personal communication 2007), they do not generally form large aggregations in night roosts. Night roosts can be located in a variety of structures ranging from bridges, caves, buildings and other structures.
**Interim Roosts**

Townsend’s big-eared bats have occasionally been found in aggregations in spring and fall. These sites are often located close to, but not at the same site as maternity roosts. Some evidence suggests that spring time aggregations are pregnant females using specific sites as “staging” sites for colony formation prior to parturition. Autumn roosts have been documented for other species as important for mating and this may hold true for Townsend’s big-eared bats also. These sites are termed “swarming” sites and are thought to be predominantly males with females visiting the site to breed (Steve Cross, personal communication). Small groups of Townsend’s big-eared bats have been documented in mines during the fall (personal observation). I have also observed individual bats, or small groups of two or three bats using sites on an interim basis during the late breeding / early dispersal season.

**Foraging Behavior, Habitat, and Diet**

Townsend’s big-eared bats are generally considered to be late fliers and research has generally suggested two peaks of activity during the night; this also holds true for pregnant females. After parturition and during lactation, females return to the colony up to three times per night to nurse pups. During late lactation, females may remain away from the colony the entire night. They are known to forage within forested habitat and along heavily vegetated riparian corridors, and generally avoid open, grazed pasture land and introduced vegetation (in a study on Santa Cruz Island in California (Brown et al 1994)).

The Townsend’s big-eared bat is a slow-flying (2.9-5.5m/sec (9.5 to 18.0 ft/sec), highly maneuverable bat and has been observed gleaning insects from vegetation. It is a lepidopteran specialist, with a diet consisting of greater than 90 percent moths. Its soft echolocation call indicates it is capable of foraging in very cluttered environments.

Bats are important predators on agricultural pests. The estimated 100 million Brazilian free-tailed bats (*Tadarida brasiliensis*) living in Central Texas caves consume approximately 1,000 tons of insects nightly, a large proportion of which are agricultural pests. Bats are also equally important predators of forest pests and important for forest health. While no particular studies have been done on Townsend’s big-eared bats, feeding studies of big brown bats indicate that they consume significant crop and forest pests including ground beetles, scarab beetles, and numerous species of moths and leafhoppers.

Like many bat species, reproductive females often can consume their body weight in insects each night (Bat Conservation International website).

**Reproduction and Development**

Females may breed as early as four months of age while males do not mature sexually until two years of age. Copulation is preceded by ritualized courtship behavior. Mating generally takes place in the hibernacula between October and February although some females may have been inseminated prior to arrival at the hibernacula. The female stores sperm in the uterine lining until spring when ovulation and fertilization occur. Gestation varies with climactic conditions and generally lasts from 56-100 days.
Birth occurs between May and July, likely dependent on local climactic conditions. Weather conditions prior to birth may affect timing. If bats go into torpor during cold spring storms, birth would be delayed and parturition may coincide with more favorable conditions for survival of young (Willis et al. 2006). Exact timing of parturition may also be dependent on food availability for pregnant females, and thus fetal development (Arlettaz et al. 2001). A single pup is born and weighs an average of 2.4 grams at birth, nearly 25 percent of the mother’s post-partum mass. Young are capable of flight at 2.5 to 3 weeks and are fully weaned at 6 weeks (Pearson et al. 1952).

Nursery colonies begin to disperse about the time young are fully weaned (August) and break up altogether in September or October. Birth rate is low, with females giving birth to one young per year. First year survival averages 38 to 54 percent (Pearson et al. 1952 in Pierson et al. 1999), and adult survivorship is approximately 80 percent.

Behavioral ecology

Roosting behavior of Townsend’s big-eared bats makes them highly vulnerable to disturbance. They generally show high roost fidelity. They also roost in highly visible clusters on open surfaces, both during the maternity and hibernating seasons and seldom seek shelter in crevices (Dalquest 1947, Barbour and Davis 1969, Kunz and Martin 1982 in Pierson et al. 1999). If a large proportion of a colony is lost, the low reproductive rate of bats would limit recovery of a population for a considerable length of time; bats cannot sustain elevated rates of mortality or depressed levels of recruitment (Hill and Smith 1989, McCracken 1989 in Journal of Mammalogy, 1992). There may be a minimum viable colony size below which an individual’s reproductive success could be threatened (Tuttle 1979 in Racey and Entwistle 2004 p. 714).

III. Threats

General Threats

Bats have a generally bad reputation with the public and it is not uncommon to find roosts littered with dead bats, obviously killed by humans; several thousand *C. townsendii* were killed in an arson fire in New Mexico in 1992 and an individual was seen shooting a rifle into a Brazilian free-tailed bat roost (approximately 80,000 bats) in Nevada in 1993. “These unrelated incidents underscore the extreme susceptibility that aggregated bat populations have to injury and by uninformed and/or misinformed general public.” (Pierson et al. 1999).

The most limiting resource for bats is undisturbed roosting habitat (Tuttle, personal communication 2006). Loss of suitable, undisturbed habitat can result in reduction in reproductive success, reduction of populations, or extirpation of colonies. As this species in southwest Oregon exists in small colonies in relatively limited habitat, the loss of a few suitable colonies could have implications for the species in the region. This highlights the importance of protecting and maintaining all extant colonies.
Disturbance

Townsend’s big-eared bats are very sensitive to disturbance during both the maternity and hibernating seasons. They have been known to abandon maternity roosts, or abort or abandon young pups because of disturbance during the maternity season. They exhibit high roost fidelity, but bats will abandon long-established roosts for less suitable habitat when disturbed. Lower survival and/or fecundity probably result. The implications for disturbance of maternity colonies were emphasized by Humphrey and Kunz (1976) in a study in Kansas and northern Oklahoma:

“…clearly handling and simply the presence of people cause this species to desert preferred roosts as well as alternate roosts. It is unknown whether reduction results from direct loss of embryos or young, delayed development followed by failure to over-winter or failure of living females to occupy the nursery the next year. Whatever the mechanism, nursery populations decline after disturbance and do not recover in the following year.”

Disturbance within a hibernaculum is another issue entirely; disturbance during the winter can threaten survival. Bats store fat during the late summer and early fall to survive through the winter when food sources are low and environmental conditions are not conducive to active foraging (i.e. foraging will not result in a net gain of energy). Fat stores are marginally adequate to sustain a bat during the winter. During hibernation, bats go into torpor, where body temperature ($T_b$) drops to near ambient temperature. This is very energetically efficient; basal metabolism lowers to less than 25 percent of basal metabolic rate (Speakman and Thomas 2004 pp. 459 – 460).

Disturbance by humans can be purposeful or accidental. Speakman and Thomas found that even brief visits to caves where no bats were handled resulted in an arousal from hibernation lasting up to 8.5 hours. Human disturbance affects arousal frequencies and potentially has a negative impact on winter survival of bats (Id. p. 462). They found that each arousal of several hours duration for the little brown bat, *Myotis lucifugus*, costs up to 108 mg of fat or the equivalent energy stores for 67 days of torpor (Id. p. 460). With little in excess fat stores, one can easily see how disturbance can threaten winter survival.

IV. General Management Direction for Townsend’s Big-eared Bat Roost Sites

Management Direction

The Medford District Resource Management Plan provides management direction for known roost sites for bats. For known roost sites, as an interim measure, the RMP (p. 53) designates a no timber harvest buffer of 75 meters (250 feet). The RMP also states that management standards and guidelines (p. 53) and a management plan (p. 57) be developed for each site. This implies that a management plan would override the recommendations in the RMP based on site-specific conditions. Natural caves are protected under the Federal Cave Resources Protection Act of 1988 (Appendix B). Protection extends to protection of cave resources and disclosure of location.
General Management Recommendations
Despite variability in microhabitat characteristics and seasons of use, there are some general management recommendations that should be considered for this species. (Management recommendations for the six specific sites addressed in this plan are included below.)

Management recommendations should be instituted where feasible, practical and necessary to minimize disturbance from land management and other activities.

- **Use of roosts by Townsend’s big-eared bats is complex and dynamic** (Sherwin et al. 2003). All mines and caves should be assumed to be occupied whether bats have been documented using them or not. Surveys to determine occupancy are time consuming and could be hazardous. Minimal surveys have occurred at most sites on the Grants Pass Resource Area and it can take up to 10 visits during a season to confirm that bats are not using a complex site (Sherwin et al. 2003). Use in shallow adit sites that can be safely entered can be determined during single seasonal visits. Sites that do not have documented use should continue to be protected because these sites likely get occasional use and could serve as refugia if nearby sites are disrupted because of natural occurrences (e.g. cave in, wildfire), or anthropogenic disturbances. In further support of this, bats have been documented (bachelor colony and females with young) in past years where none were documented in surveys during 2006 (personal observations). See specific sites below for details.

- General management recommendations include buffering sites from land management activities and disturbance, and minimizing visits to roost sites.

- With the exception of blasting activity, a buffer of 75m (250 feet) around adits with potential bat habitat should protect the colony from disturbance without the additional requirement of a seasonal restriction. For blasting, a no disturbance distance of approximately 0.5 miles is recommended, dependent upon local topography (Michael Herder, personal communication 2006). Changes to this distance due to topography should be made in consultation with the project or Resource Area wildlife biologist.

- Prescribed burning should generally not occur within 400m (1,300 feet) of a site to avoid disturbance to roosting bats unless a site-specific assessment indicates a more appropriate distance to avoid heat and smoke effects to bats (Ormsbee, personal communication 2006). Generally, no burning should occur within 75 to 300 meters (250 to 1,000 feet) of an occupied site during the maternity period (May through August) or the hibernation period (October to mid-April), because of the possibility of smoke drifting into the roost. The smaller distance would be appropriate if there is little chance of smoke drifting into the roost with the larger distance applicable if prevailing winds at the time of the burn would carry smoke into the roost.

- Fuel hazard reduction could occur in the immediate vicinity of roosts if bats are documented as absent during activities and if treatments would not affect the microclimate variables of the site. Treatments in dense stands could benefit through treatment of hazardous fuels as well as some small diameter (≤ 12”) thinning; depending
on a site specific assessment, treatments could occur up to the adit opening. Treatments could include removal of small diameter conifers and brush species within the buffer area, while retaining the current canopy closure. Particular attention should be made to retain air flow, and temperature and humidity of the site (i.e., the overstory canopy should be retained to the extent necessary to maintain the temperature/humidity regime of the site).

- Where bats presence has been documented, internal surveys should be limited to once every two years during the season of bat occupancy. This will minimize chances of disrupting the colony. Surveys should be as short as necessary to document presence. Known maternity sites should be surveyed only using exit counts. Exit counts can occur multiple times each year if they can be done without disturbing the colony. Potential sites that have not been surveyed can be surveyed by visual or acoustic monitoring the exit(s) from dusk until total darkness, or by trapping. Utilization of a bat detector (Pettersson’s® or Anabat®) during visual monitoring is recommended. Outflight monitoring can occur from spring through early fall. Multiple surveys are required to confirm non-use during any one year; however, it should be noted that bats may use a site one year and not the following year. They may also use a site on an intermittent basis.

- Entering caves and adits can be very hazardous and should not be done without proper training and personal protective equipment. If entering the sites is not recommended because of safety concerns, bat detectors or limited trapping can be used to monitor the site to determine the level of activity. Alternatively, surveys can be contracted to someone with experience with bats and training in assessing hazards in mines and caves. Surveys at suspected maternity sites should be limited to outflight surveys during the maternity season. If no bats are sighted during outflight surveys, trapping with harp traps could be utilized.

V. Grants Pass Resource Area Sites

Oak Mine

Site Description
This site is composed of a series of adits and shafts all within approximately 100m (330 ft) of each other. One shaft slants down at approximately 45 degrees and appears very unstable; the opening is approximately 1m x 1m. The adit that houses the maternity colony is shallow and easily accessible. The adit is less than 20m (65 ft) deep with an entrance approximately 1m x 2m (3ft x 6ft). There is a shaft just outside the adit and one just inside. There are two alcoves, one just inside the adit and the other at the rear; bats have been found in both alcoves, but the largest concentration is near the end of the adit. The adit is near a major road and is within 50m (160 ft) of a four-wheel drive road that is currently little used because of a fallen tree.

There are no active claims at this site.
Site History / Bat Use and Survey Data
The Oak Mine houses a sizable maternity colony of Townsend’s big-eared bats from around mid-March through mid-August. The mine has been known since at least 1992. Bats were first documented in Oak Mine in 2002 with approximately six Townsend’s big-eared bats in torpor located in the rear alcove of the adit and one additional bat in the entrance alcove (likely a *Myotis volans* (personal observations)). Hibernation was documented in April 2002. The maternity colony in this mine was discovered in July 2003. The first maternity colony consisted of bats found in the entrance alcove in five clusters ranging from approximately 4” x 6” to 12” x 16”. Upwards of 60 bats were estimated in this colony at this time. Outflight counts (n=5) in subsequent years have documented up to 137 bats (range 86 (early season) – 137) in the maternity colony, and winter observations have documented up to 12 (range 0 - 12) bats in the early spring. Use appears to be more consistent beginning around mid-March to early April, and likely coincides with beginning of formation of the maternity colony. In the early fall, bats have been found in torpor in the mine; none have been found in mid-winter.

Prior to discovery of the colony in the Oak Mine, there were only six significant maternity colonies documented in the state (Pierson et al 1999); this is the second significant colony located in the Jackson/Josephine County area.

Vulnerability
The Oak Mine is particularly susceptible to anthropogenic disturbance; it is located within 0.5 miles of a major road and has a four wheel drive road passing within 50m of the adit occupied by the bats. While the colony does not appear to have been disturbed since its discovery, a single visit could cause a considerable decline in the colony’s population.

Though the four-wheel drive road is currently blocked by a fallen tree, it is easy to see how even a single disturbance to this colony can result in displacement, considerable reduction in the population, or even extirpation of the colony.

Site Specific Management recommendations
There are several management options that could provide varying levels of protection for this colony. The adit, along with associated adits and shafts, is within the Granite Horse Landscape Management Project area. There is currently a no treatment buffer of 75m (250 feet) around the series of adits in the area for protection of bat habitat under the Granite Horse Environmental Assessment.

- This buffer should remain in affect for all activities, with the exception of select fuels treatments to reduce the risk of loss of habitat or undesirable changes to microclimate conditions for the colony. Treatments could include removal of small diameter conifers and brush species, particularly above and to the north of this site within the buffer area. There is little to no need for fuel hazard reduction below the site.

Additional management options include:

- Close the road with berms, tank traps and/or additional fallen trees to minimize the chances of anthropogenic disturbances.
• Closure of the adit with a bat friendly gate (Tuttle and Taylor 1994) (Elliott 2006, Appendix A) would be the surest manner to minimize disturbance to the maternity colony and a more permanent solution, needing little or no future maintenance. The closure would still allow indirect monitoring of the colony, and entrance to the colony if necessary for research or other purposes. Cost for a closure on this mine would be approximately $5,000.

Gopher / Baby / Lamb Mine

Site Description
The Gopher / Baby / Lamb Mine complex consists of two main adits. The initial run of the lower adit is generally flooded with a few inches of water. This adit is very extensive with shafts rising above the main adit where it branches at right angles, at approximately 40m (130 ft) in depth. These shafts, which rise over 20m (65 ft), are extensive, with wood bracing and ladders. Exploration of this shaft would be difficult and hazardous. The left branch of the adit is generally flooded and has not been explored as it displays similar hazards. The right branch extends a considerable distance further and dead ends in two or three branches – this adit and branches are usually dry, at least during the summer months. The ceiling and walls of both the main adit and the shaft area continually drip water and there is always standing water in the adit.

The upper adit extends in approximately 9m (30 ft) and then bends to the right for an additional 15m (45 ft). It is usually dry, although the floor becomes muddy during the winter months. Other than a small cave-in at the entrance, this adit is stable.

This site has historically been accessible via a road that passes directly in front of the lower adit. It has received considerable use as evidenced by trash in the entrance and graffiti near the back of the secondary adits (right branch). The road was blocked and tank-trapped around 2004; this has successfully prevented vehicles from driving to the adit and likely reduced visitation.

The lower adit, while extensive, does not provide ideal conditions for bats. High humidity levels from standing and dripping water likely preclude long term occupancy by bats, although unexplored areas may be suitable for hibernation or other roosting. The flooded main shaft likely minimizes use by other species of animals. This also makes this mine somewhat unstable and hazardous to human visitors.

The upper adit is dryer and provides better habitat, at least during part of the year. There is no air flow in this adit, but Townsend’s big-eared bats have been documented in this adit during the fall, likely using it as a swarming site. It is unknown if human visitation affects bats’ use of this adit. It has not been documented as a maternity roost or hibernacula; however, if other nearby sites are disturbed, this site could serve as a refugia.

There are no active claims at this site.
Site History / Bat Use and Survey Data
Extensive surveys of this adit have not been done; the potential instability of the lower adit limits survey opportunities. Surveys during the fall (2001) using a Tuttle Harp Trap have trapped bats at the lower adit. Use as a hibernacula, swarming site or intermittent roost is unknown; however, Townsend’s big-eared bats have also been documented roosting in this adit.

Five (5) Townsend’s big-eared bats were sighted in the upper adit in October 2001 (personal observation). Three bats were hanging from the ceiling approximately 3 m (10 feet) in from the entrance. One of these was in torpor. Two bats were sighted flying in the vicinity of the bend in the adit. It was suspected that more bats were in this adit.

Vulnerability
Blocking of the road accessing the mine in 2004 likely reduced visitation, but this has not been documented. The adits are within 0.5 miles of a road and likely still get some human use. While use does not appear to be extensive, human caused disturbance of the site when bats are present would reduce the habitat suitability of the site.

Site Specific Management Recommendations
While the lower adit does not provide prime habitat conditions, it does get some use. Closure of the lower adit with a bat friendly gate is recommended, largely because of safety concerns. Closure of the upper adit, while it could reduce human disturbance, is not warranted given the difficulty accessing the site, the low human use, and only seasonal use by bats. Cost for constructing a closure on the lower adit would be approximately $6,000. This would include the costs of opening the road for access and re-closing it following construction of the closure.

Tip Top Mine

Site Description
The Tip Top Mine consists of a fairly extensive adit system with a shaft and one main adit; the shaft drops into a large (~20m x 20m (65 ft x 65 ft)) cavern. The adit leads to the cavern in approximately 60m (200 ft), and has one short (~10m (30 ft)) branch. After 60m, the adit branches with the right branch leading to the cavern and the left branch continuing downward for a further 60m. There are several additional dog tunnels along this adit. The shaft and a shallow trench (collapsed adit) leading to it were once covered by a wood structure with wood shingles. This structure probably collapsed sometime in 2003 or 2004. There is the wreckage of an old ore processing complex nearby.

There are other adits in the area, but use by bats is unknown. The cavern area does not provide ideal habitat conditions, but provides some habitat and may serve as a refugia if other nearby sites are disturbed.

The site has experienced some mining activity in recent years and two miners died in the adit from carbon monoxide poisoning (ca. 2003). There are no active claims at this site.
Site History / Bat Use and Survey Data
The mine is used as a maternity roost and a hibernacula, with at least 40 bats documented in a
maternity colony, and 26 bats using it as a hibernacula. Bats have been documented in 2005 and
2006 in the cavern area of the complex, although in lower numbers.

A relatively large maternity colony once occupied the cavern and wood structure over the
shallow, collapsed adit. After this structure collapsed, microhabitat likely changed, and use by
bats declined considerably. It is not known if the cavern still provides suitable habitat
conditions for the maternity colony.

Vulnerability
There is a combination of private and public roads leading to the adit. It likely does not get
extensive human use, but mining has occurred in recent years. Because of relatively easy access,
anthropogenic disturbance is probably the most serious threat to this site.

Site Specific Management Recommendations
There are several management options that could provide varying levels of protection for this
colony. The adit and shaft is within the Althouse Sucker Landscape Management Project area.
There is currently a no harvest buffer of 75 meters (250 ft) around the site for protection of bat
habitat under the Althouse Sucker Environmental Assessment.

- This buffer should remain in affect for all activities with the exception of fuels treatments
to reduce the risk of loss of habitat or undesirable changes to microclimate conditions for
the colony.

Additional management options include:

- The site is in a dense stand which would benefit both through treatment of hazardous
fuels as well as some small diameter (≤ 12”) thinning. Treatments could include removal
of small diameter conifers and brush species within the buffer area, while retaining the
current canopy closure.

- Close the public road with berms, tank traps and/or fallen trees to reduce anthropogenic
disturbances. Explore the possibilities of working with private landowners on closures
on private lands.

- Closure of the adit with a bat friendly gate would be the surest manner to minimize
disturbance to the maternity colony and a more permanent solution, needing little or no
future maintenance. The closure would still allow indirect monitoring of the colony, and
entrance to the colony if necessary for research or other purposes. Cost for a closure on
this mine would be approximately $6,000. While both the adit and shaft would need to
be closed, costs for the closure could be minimized by building a chain link fence around
the shaft. Building a bat friendly gate would increase the cost by approximately $4,000.
Jewett Mine Complex

Site Description
The Jewett Mine complex was first explored in 1976 and is the site of one of the most significant maternity colonies of Townsend’s big-eared bats in southern Oregon (Steve Cross, personal communication 2006) with approximately 200 bats documented in one of the adits. There are at least five adits and two shafts. Two of the adits have known maternity colonies and all have been documented as being used as hibernacula.

The adits and shafts are generally considered to be stable; however, there are safety considerations of open shafts, hazardous access, loose rock and steep entrances to some of the adits.

The sites are located on BLM and maybe on private lands; currently however, the only access is from Green’s Creek, which necessitates a long hike. Currently one of the land owners has restricted access only to utility workers who maintain towers on Mount Baldy. The access road borders his property and a short segment may be located on his property. He has refused access to BLM, but BLM is currently working with him to gain access to the BLM road and resolve property boundary issues. The landowner has expressed an interest in mining two of the lower adits, one of which provides habitat for the significant maternity colony.

There are no active claims on the mines on BLM lands.

Site History / Bat Use and Survey Data
Discovery of the site occurred some time prior to 1991. A significant maternity colony of Townsend’s big-eared bats is located in Adit / Shaft #1. BLM biologists surveyed the site in December 1991, locating several bats in torpor. Trapping in 1992 documented Townsend’s big-eared bats, big brown bats (*Eptesicus fuscus*) and an unidentified *Myotis spp*.

A survey in September 1993 documented 34 Townsend’s big-eared bats, (30 female, 4 male), and three California myotis (*M. californicus*). Townsend’s big-eared bats were captured in 1998 and 1999 during a radio-tracking project of lactating females.

Limited surveys in 2006 documented bats in torpor in two shallow adits.

Vulnerability
The mine has limited access which minimizes disturbance. BLM is currently unable to easily monitor the sites and the extent that the mine is being worked is unknown. The landowner is aware that there are bats that use the mines. It is unknown to what extent the land owner is working the mines or if he is avoiding disturbing the colony.

Site Specific Management Recommendations
Access is limited at this time. It is recommended that the right-of-way issue be resolved. This would allow installation of bat friendly gates or monitoring of the sites. With resolution of access issues, the following management actions are recommended:

- Maintain a permanent closure on this road with current limited access to property owners, BLM and for utility workers to Mount Baldy.
• Maintain a 75 m (250 ft) no treatment buffer around all shafts and adits. There is currently limited need for fuel hazard reduction although limited fuels treatment may be warranted.
• Work with the land owner to restrict his mining activities, which may disturb the colony during the maternity season (May through July, or August, depending on monitoring results).
• The shaft above Adit #2 should be fenced as it drops 20m (65 ft) or more.
• Consider installing a bat friendly gate on adits and shafts for safety concerns and to limit disturbance to colonies, especially the major maternity colonies (Adits #1 and 3 in the site file). Note that if closure of the roads is maintained and disturbance to the sites is limited to late summer, adit closures may not be necessary. If closure is considered, because of difficulty in accessing one of the adits (it is not accessible via a road, but could be reached via OHV) and the size of the more accessible adits (two in close proximity), costs would run upwards of $15,000.

Pickett Mines

Site Description
The Pickett Mines are a series of at least four adits ranging from 3m to 20m (10 ft to 30 ft) in depth. The adits are scattered along Pickett Creek and Panther Creek with the three largest adits exiting into the creeks. The adit on Panther Creek has not been explored. It is flooded all year and there is a flooded shaft (depth unknown) just inside the adit. All of the adits usually have standing water. The two adits on Pickett Creek are approximately 20 m (65 ft) deep.

There are no active claims at this site.

Site History / Bat Use and Survey Data
Bats have been documented in three sites on upper Pickett Creek; they all appear to be used on an interim basis. During one opportunistic survey, three bats were sighted including a female with her young clinging to her (personal observation). These mines do not appear to get extensive use; however, the documentation of use by a mother and young illustrates the importance of maintaining all cave / mine sites as undisturbed as practicable to maintain optional roosting sites and refugia.

Fuel hazard reduction treatments have been completed within 75 m (250 ft) of the Pickett Creek sites under the Pickett Snake Landscape Management Project.

The Panther Creek adit has not been surveyed and suitability of habitat is unknown.

Vulnerability
The sites on Pickett Creek are scattered and no trails lead to them. Vulnerability to anthropogenic disturbance is low. The site on Panther Creek is accessible via a trail that passes along the entrance to the adit. However, as the adit is flooded, it is not expected to experience much human use.
Site Specific Management Recommendations
As the Pickett Mines experience little to no visitation by people there are no recommendations at this time to protect these sites. Occasional visits to the two larger adits are recommended to determine that they are not experiencing increased visitation.

No Name Cave / Mud Cave

Site Description
This site includes two caves. No Name Cave is a large cave that extends back approximately 45m (150 ft). There is an alcove at the entrance measuring approximately 10m wide, 4m deep and 2.5m high (30 ft x 12 ft x 8 ft). The main cave is accessed through a narrow tunnel at the back of the alcove. It measures 1m in diameter by 10m long (3 ft x 30 ft). It opens into a large cavern, approximately 10m high at its highest point.

Site History / Bat Use and Survey Data
Amateur cavers have been visiting these caves for many years; they were first mapped in 1964. However, No Name Cave and Mud Cave did not come under BLM management until 1994 when they were acquired as part of a land exchange. By that time, the caves had already been heavily vandalized. Many of No Name Cave’s stalactites and stalagmites had been damaged or removed, garbage was prevalent and graffiti had been sprayed on the cave walls. Mud Cave has minimal stalactite or stalagmite formation. Both caves were gated by BLM in 2000.

The No Name Cave closure has been vandalized and attempts to maintain the integrity of the gate have failed. No Name Cave limestone formations also continue to be vandalized, although the most accessible features have already been taken. The Mud Cave gate has remained intact and continues to protect hibernating bats. However, there have been recent attempts (2006) to gain access.

Bats regularly use Mud Cave as a hibernaculum, with documentation of up to nine bats in torpor during winter surveys. No Name Cave regularly has bats in the alcove and Townsend’s big-eared bats have been documented in the main cave.

Vulnerability
While an attempt has been made to close the main road to the caves, off-highway vehicles (OHV) continue to access the site both from the road and from private lands below the caves. Additionally, the landowner whose property the road passes through has open access above the closed portion of the road. This allows relatively unrestricted access to the site via OHVs.

Access to No Name Cave through the damaged closure continues the pattern of human disturbance at this site. Recent attempts to access Mud Cave illustrate the continued vulnerability of this hibernaculum because of easy access by OHVs or other vehicles.

Site Specific Management Recommendations
• As funding and resources allow, continue annual monitoring of the site to assess the extent of human disturbance and vandalism.
• Block access on the road by tank traps and/or berms.
- Permanently decommission the OHV trail with large boulders and/or trees
  - Work with the land owners to restrict access to this trail, or
  - Reroute the trail.
- Maintain and/or repair the bat friendly closure after access issues have been resolved.
  Cost of repairing the closure would be approximately $2,000. Cost of effectively closing the road and/or rerouting the trails would be approximately $3,000.

**Additional Roost Resources**

There are a number of additional sites that are known or suspected to provide habitat for Townsend’s big-eared bats during varying periods throughout the year. Note that only minimal, if any surveys have been done at the following sites. It may also take up to 10 surveys during a season to determine with a 90% probability that a site is not being used (Sherwin et al. 2003). Therefore, it is likely that more use occurs than has been documented.

Among the sites with known use are the following:

**Golden Standard Mine – hibernacula**
  Threats: currently an active claim

**Bamboo Gulch – hibernacula, interim roost, possibly maternity site**
  Threats: near a road

**Humdinger / Snow Bird mines: hibernacula**
  No known threats

**Waldo Adit: maternity colony**
  Threats: near a road with high use; site is on private land

**Almeda Mine – use documented, but minimal surveys inconclusive on use type**
  A proposal to plug the adits to eliminate acid runoff may permanently eliminated use of this site by bats.

**Deer Mom Adit – maternity, possible swarming site**
  Threats: easily accessible, shallow adit. Note that the area around this site burned, killing all vegetation (moderate BAER severity) in the vicinity during the Deer Creek Fire (2005) and current use is unknown.

Bats have also been documented in Grants Pass Resource Area at Lime Rock, Blind Sam, Copper Queen, Owl Hollow, and the Golden Mary Mine. The general management recommendations listed above should be instituted at all mine and cave sites as practicable and necessary, even for shallow adits greater than 5m in depth. To reiterate, even sites which do not have documented use may provide important habitat and/or refugia from disturbed sites.
VI. References and selected literature:


Idaho Department of Fish and Game. 1999. Species Conservation Assessment and Conservation Strategy for the Townsend’s Big-eared Bat.


Cave Gating Criteria

William R. Elliott, Ph.D.
Cave Biologist, Resource Science Division
Missouri Department of Conservation

Rationale

Poor cave gates can harm wildlife and cave resources. There are many reasons for not gating a cave, and cave gating is not automatically recommended by the Missouri Department of Conservation (MDC). In Missouri private cave owners are generally protected by law from legal liability for injuries to cave visitors, unless it is a commercial show cave. Cave gating is a technical subject that requires knowledge and experience; for example, it cannot be done properly by a general welding contractor without providing specifications, a design and on-site supervision by an experienced cave gater. Knowledge of the cave’s ecology, especially bats, is necessary before a gate is considered. MDC assists cave owners in cave gating, but first a decision guide must be followed (below).

Cave Gate Types

Depending on the needs of the cave, the type of entrance, bats and other wildlife, the design could specify a full gate, half gate, chute gate, cupola gate, vertical bar fence or no gate at all (see illustrations). Caves that have lost their bats may be recolonized with proper gates. Except for vertical bar fences, all gates must have horizontal bars to admit bats, as they cannot fly between vertical bars. Full or constricted gates are not recommended for maternity colonies of Gray bats. Some bat caves that may need a gate for protection are not feasible to gate for certain physical reasons. Many caves that are feasible to gate do not need to be gated because other modes of protection may work better.

Appendix III
Design A

Proper design for a “full” bat gate by ACCA’s Roy Powers. From BCI’s Bats and Mines.
Who is Qualified?

Bill Elliott is the cave and karst coordinator for MDC, and all MDC cave studies and cave gating projects should go through him for scoping, design and approval. Bill has many years of experience in cave ecology, cave management, and cave gating. A few MDC personnel, who are trained in the latest cave gating methods, can work with Bill to build gates, but are not experienced in cave gate design.

Three experts are Roy Powers, Jr., of Duffield, Virginia; Jim Kaufmann, Newburg, MO; and Jim Nieland, U.S. Forest Service, Mount St. Helens, Washington. Mr. Powers is an engineer and cave ecologist who has designed, built, or supervised, more than 600 cave gates. Roy is the leading innovator of bat-friendly cave and mine gates, sometimes called “air-flow bat gates”, for the American Cave Conservation Association (ACCA). ACCA is a nonprofit organization based in the city of Horse Cave, Kentucky, with expertise in cave conservation, restoration, gating and education. ACCA's designs were adopted by Bat Conservation International (BCI) and many government agencies, and have become the industry standard, as specified in the publication "Bats and Mines" by BCI (see Recommended Reading below). Jim Kaufmann has built many cave gates, and he contracts with several agencies. Jim Nieland is a cave specialist for the U.S. Forest Service who builds cave gates and teaches cave gating.

ACCA and BCI, in cooperation with the U.S. Fish & Wildlife Service, U.S. Forest Service, and many agencies, have taught numerous, regional, cave-gating workshops to demonstrate the proper decision-making process, design, and construction techniques for ecologically sound cave gates. These gates have resulted in significant protection and increases of colonies of endangered bats, such as Grays,
Indianas, and others. Protection of other irreplaceable cave resources is another benefit of properly built gates. Major clients include U.S. Army Corps of Engineers, Bureau of Land Management, U.S. Forest Service, National Park Service, and numerous state and local agencies.

Specifications

Specifications vary for different gate styles (see "Bats and Mines" by BCI). Gates are usually made of mild steel. “Modified steel” has more carbon, is stronger and stiffer, and may cost only a little more than mild steel. Stainless and manganal steels are optional for gates in corrosive environments, but they are several times more expensive than mild steel and are unnecessary in most applications. Some special designs are more resistant to hacksaws.

A good gate is made mostly of 1/4" thick angle iron, stronger than the common ¼". The sill (bottom of the gate) is of 6 x 6" angle, usually set over a mat of expanded metal, which prevents vandals from tunneling under the gate. The pins are welded to the gate via large hangers made of 6 x 6" angle, providing more strength than welding the pins directly to the gate. The horizontal bars and columns usually are made of 4 x 4" angle iron strengthened with T-bar stiffeners welded inside from 1 1/2 x 1 1/2 x 1/4" angle; this resists bending from hydraulic jacks. Sometimes we use concrete and re-bar to stiffen the bars. The horizontal bars are spaced at 5 3/4" between bars on hangers made from 6 x 6" angle. The bars are spaced using spacing gauges that can be knocked out after the bars are welded to the hangers. Gates built by novices is that the bars may be irregularly spaced, which can discourage bats and invite humans to crawl through. The drawings in this document detail bars and stiffeners.

To finish the gate, a “bat guard” is welded on the front of the bars at each column, to prevent bats from tearing their wings on hangers. A removable bar with a hidden latch and shrouded (boxed-in) lock is now standard, and is more resistant than a hinged door is to vandals with tools. We normally use padlocks with brass or coated parts to resist rust. Combination locks and chains around the gate should be avoided because they are more vulnerable to bolt cutters and hammers. However, a well-protected, heavy-duty combination lock may be useful on a cave that is monitored often; the combination should be changed routinely.

Many gates are not coated, but any coatings that are applied should be brushed on, not sprayed, to avoid volatiles from entering the cave. Cave gates usually are constructed during a season when bats are not vulnerable, or when air is flowing out of the entrance, thus removing welding fume from the cave. If airflow is not adequate, an air curtain should be put up to keep fumes out of the cave. Ventilation fans may be needed for worker safety (see Elliott, 1995).

Limited space does not allow a full discussion here of the many construction techniques that have been developed for cave gating. Please see Recommended Reading for helpful literature.

Estimates

Jim Nieland developed some cost estimation methods based on past projects. In 2002 mild steel was estimated at about $8.88 per sq. ft. of standard gate. The steel weighs about 22.2 lb. per sq. ft., and the average cost per lb. was $.42 with a range of $.38-.50. Prices have increased since then. In 2005 we paid $.36 per lb. on a low bid.

Gates built by volunteers may cost as little as $25 per sq. ft., materials included. Gates built by agency personnel may cost about $30 per sq. ft., and by contractors up $50 per sq. ft. or more unless the labor
and materials are provided. Many projects include both paid and volunteer labor, so the cost may vary between the above limits. The above examples do not include administrative costs and staff time, which may send the total cost above $60 per sq. ft.

What to Avoid

A few rules of thumb can be followed. Natural entrances should not be sealed because that would change the natural meteorology of the cave and access by native wildlife. Opening a long-sealed cave also can cause problems for the cave unless some means of protection is devised. Gates should not be made of re-bar (it is much too weak). Chain link fences are easily violated. Do not construct any raised footings, stone work, or concrete walls on the floor or around a gate because they can hinder air exchange and cause a change in temperature at the bats’ favorite roosts. Gates should be tailored for the wildlife inhabiting the cave. A cave gate is not a substitute for good land management, but a last resort.

The world’s second largest cave gate, Great Spirit Cave, Pulaski County, Missouri. The half gate weighs 18 tons and is 101 ft. wide and up to 14 ft. tall. Completed in October 2002, it protects endangered Gray and Indiana bats and multiple resources. By Mike Slay.
The “chute gate” at Tumbling Creek Cave, Taney County, Missouri. The rectangular, expanded-metal chute allows maternal Gray bats to access the cave. The colony increased after the gate was built, April 2004. By Bill Elliott.

A cupola, or cage gate (from *Bats and Mines*) is used on some sinkhole entrances. Some are built on a slope with an beveled bottom.
A 10-foot-high, vertical bar fence around a pit entrance in Missouri. The access door is temporarily open. By Jim Kaufmann and Kenny Sherrill.

**Recommended Reading**


A review of cave gating innovations and the decisions that precede a cave gate.


Discusses the gating of Little Scott Cave and how it prevented vandalism.

Missouri Revised Statutes. 2004. Chapter 537, Torts and Actions for Damages, Sections 537.345-348. [http://www.moga.state.mo.us/statutes/statutes.htm](http://www.moga.state.mo.us/statutes/statutes.htm)


The best all-around article on how to do a cave gate.


Cave Gating Decision Guide

1. **Are there poor reasons not to gate** the cave? For example,
   - Purely aesthetic objections to a gate while the cave's resources are being degraded anyway.
   - It may "start a trend" towards too much gating.
   - Because a few people consider themselves above the rules and may threaten the gate.

Score no points for any poor reasons not to gate.

2. **Are there poor reasons for gating** the cave? For example,
   - For fear of liability, which probably is nonexistent. Cave owners are protected by law in Missouri.
   - For administrative convenience (instead of having a comprehensive conservation program).
   - To keep wild animals or competing explorers out.

Score no points for any poor reasons to gate.

3. **Are there good reasons not to gate** the cave? For example,
   - The gate will not comply with current ACCA and BCI standards.
   - A vigilant owner or manager lives nearby.
   - Other controls can be used—road gates, signs, surveillance.
   - Visitors probably will comply with a good permit system.
   - Experts are opposed to the gate.
   - The cave gaters are inexperienced and overconfident.
   - No one will commit to checking and maintaining the gate.
   - Technical reasons: The entrance is too small for a proper gate (e.g., half gate for Gray bat maternity colony), or the environment or budget will not allow a good design.

Score one point each **against** gating if any good reasons against gating hold true.

4. **Are there good reasons to gate** the cave?
   - The cave is hazardous to casual visitors and no other controls (permits and signs) are adequate.
   - Endangered species inhabit the cave and can be bolstered by protection.
   - The cave is a target for vandals, looters and trespassers. A "better clientele" is needed.
   - The cave has high value, is threatened, and it can best be studied and appreciated with a good permit system combined with a gate.

Score one point each **for** gating if any good reasons hold true.

**Final results:** Add up the points for and against gating, and determine which seems more important. Other criteria may have to be considered.

********************************************************************************

This document is in the public domain, and it may be used, without alterations, for educational purposes, although its audience primarily is in Missouri. — William R. Elliott, 9/8/06

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 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 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.—
(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, 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 subsection (b).
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 maybe). 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) 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.