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Conservation Assessment for the Spotted Bat relative to the Black Hills National Forest South Dakota and Wyoming

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Dr. Cheryl A. Schmidt received her Ph.D. from Texas Tech University in 1995 under the direction of Dr. Robert J. Baker. She has conducted surveys of small mammals and bats, and worked on the ecology of these groups in South America, Mexico, the southwestern United States, Missouri, and the northern Great Plains, including the Black Hills region. Dr. Schmidt is currently an Associate Professor of Biology at Central Missouri State, an adjunct faculty member at Black Hills State University, and a consultant for BS Biological Services. In the summer of 2002 she began small mammal and bat inventories of National Park Service lands in the Northern Great Plains under a cooperative agreement between the National Park Service, the Rocky Mountain Research Station in Rapid City, SD and Colorado State University. She is a member of a team of biologists from South Dakota working with the SD Game Fish & Parks to develop a statewide management plan for bats. In addition, she is working with several groups in western South Dakota to develop research projects addressing foraging habitats and diet for bats in the Black Hills and other areas of western South Dakota.

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INTRODUCTION

This conservation assessment addresses what is known about the biology of one of the rarest mammals in North America -- the spotted bat (*Euderma maculatum*). There is no emphasis on its biology and conservation status in the Black Hills of South Dakota and Wyoming, as it has never been recorded from this region. The purpose of this assessment is to assimilate current knowledge about this species from various sources to provide an informed and objective overview of this species' biology range-wide and, perhaps, its potential for occurrence within the Black Hills. Primary literature (peer-reviewed scientific publications) was the main information source utilized and all sources are cited.

CURRENT MANAGEMENT SITUATION

Management Status

The Wyoming Natural Heritage Database (online 2002) lists *Euderma maculatum* as a species of concern in Wyoming (global/state rank G4/S1B,S2N) as does the Wyoming Game and Fish Department (state rank SSC2; Luce et al. 1999). The G4 ranking indicates that range-wide the species is apparently secure although it may be quite rare in some parts of its range, particularly at the periphery (which, for *Euderma* would include the populations in central and western Wyoming). A G4 rank implies a cause for long term concern. The S1B and S2N refer to rankings during Breeding and Non-breeding seasons, respectively. A state rank of S1 describes the species as critically imperiled because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction. A state rank of S2 indicates the species is considered imperiled because of rarity (6-20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range. This species is not monitored by the South Dakota Natural Heritage Program (SD NHP 2002). In general, this species is thought to be distributed throughout the western states, but very rare.

Existing Management Plans, Assessments, Or Conservation Strategies

The only existing assessment found for this species was produced by the BLM in 1974:

Snow, C. 1974. Report No. 4 – Spotted Bat, Euderma maculatum. Habitat management series for endangered species. US Department of the Interior, Bureau of Land Management, Denver, CO 13pp.

This report was similar in coverage to the current species conservation assessments, but is considered "dated" by some biologists.

REVIEW OF TECHNICAL KNOWLEDGE

Systematics

Euderma maculatum, the sole representative of a monotypic genus, belongs to the Tribe Plecotini within the chiropteran family Vespertilionidae (Frost and Timm 1992). Other members of the Plecotini include the big-eared bats of North America: *Corynorhinus* and *Idionycteris*

(Bogdanowicz et al. 1998; Frost and Timm 1992; Tumlinson and Douglas 1992).

Euderma is easily distinguished from all other North American bats by its large (45-50mm), naked, pinkish ears that are joined together at the base; white spots over each shoulder on the dorsal surface, and one mid-dorsally at the posterior, all with black bases; rest of dorsal pelage is black; venter is whitish with black bases; white patches at the base of each ear; a small (~10mm diameter), naked patch on the throat that is normally hidden by surrounding pelage (Barbour and Davis 1969; Nagorsen and Brigham 1993; Watkins 1977). It would be very difficult to confuse one of these bats with any other species.

Sexual dimorphism is pronounced in this species, with females averaging more than 4% larger than males (Williams and Findley 1979). Ranges for external measurements (mm) for this species have been reported as: total length 107-115; tail length 47-50; length of ear 45-50; and forearm length 48-51 (Watkins 1977). Vernacular names for this species include spotted bat and pinto bat (Watkins 1977).

Distribution And Abundance

Distribution Recognized In Primary Literature

Overall Range

Euderma maculatum is found from central British Columbia, south through much of the western states, into the central portion of northern Mexico (Watkins 1977). The closest records to the Black Hills for this species are from north-central Wyoming in Big Horn, Park, Johnson and Washakie counties (Priday and Luce 1999). In Montana, the species has been collected in Carbon and Yellowstone counties (south-central portion of the state), and heard throughout the Bighorn Canyon National Recreation Area which is along the Yellowstone River on the south-central border between Montana and Wyoming (Foresman 2001).

Local Distribution

Euderma maculatum has never been recorded from South Dakota. Despite numerous surveys for bats in various parts of the Black Hills, spotted bats have never been detected in the region. The closest records of spotted bats are from north-central Wyoming, across a considerable expanse within which there is no roosting habitat for this species. Occurrence of this species in the Black Hills is unlikely.

Additional Information From Federal, State, And Other Records

Information from state and federal agency records are incorporated in the section Current Management Situation, above. No additional information from other state, or from federal records was found.

Estimates Of Local Abundance

This bat is considered rare throughout its range because too few have been captured to provide any kind of estimates of number, or even to provide sufficient information on most aspects of this species' biology (Barbour and Davis 1969; Watkins 1977; Foresman 2001).

Habitat Associations

The spotted bat has been reported from a variety of habitats ranging from xeric-shrub grasslands

to montane forests. Jones (1965) reported that 100% of the *Euderma* caught in his study in the Mogollon Mountains area of New Mexico and Arizona were caught in evergreen forest. Priday and Luce (1999) reported *Euderma* from a number of sites in Wyoming, the unifying habitat components being natural caves or cliff walls with crevices and proximity to water. A common plant community associated with captures of *Euderma* was xeric-shrub grassland including big sagebrush (*Artemisia tridentata*), greasewood (*Sarcobatus vermiculatus*), juniper (*Juniperus scopulorum*), various deciduous trees associated with riparian areas, and conifers and aspen at higher elevations (Priday and Luce 1999). Priday and Luce (1999) suggested that these captures were more associated with roosting areas than indicative of foraging areas.

Roosting Ecology

There is general agreement that *Euderma maculatum* roosts in cliffs (Holroyd et al. 1994; Pierson and Rainey 1998; Wai-Ping and Fenton 1989; and others). While all reported roosts for this species have been in cliff situations, these reports did not include measurements of microclimatic conditions. Wai-Ping and Fenton (1989) reported high roost fidelity in May through July in British Columbia.

Maternity Roosts

Cliffs are the only roosting habitat to which reproductive females have been tracked. Rabe et al. (1998) radiotracked a lactating female in Grand Canyon National Park to a roost in a south-facing limestone cliff. The roost was about 150m above and 200m from the Colorado River (elev. ~700m; Rabe et al. 1998). Wai-Ping and Fenton (1989) radiotracked four female *Euderma*, including one lactating female, to roosting sites in cliff faces in British Columbia.

Hibernacula

No literature describing hibernacula for this species was found.

Summer (Day) Roosts (Of Males And Non-Reproductive Females)

All reported summer roosts of spotted bats were situated in cliff faces of some sort (Holroyd et al. 1994; Priday and Luce 1999; Wai-Ping and Fenton 1989; and others).

Night Roosts

The only report of a night roost for this species was that by Rabe et al. (1998) in which they radiotracked a lactating female from her day roost site in a cliff, to her foraging grounds some 38km away. They reported that after foraging (2400-0100h), and before returning to her day roost, she night roosted until 0330-0350h in an aspen patch on the south face of a small ridge about 1km from her foraging meadow. They did not pinpoint her precise roosting spot, so it is unknown whether she roosted in the aspen themselves, or in a crevice in the ridge.

Interim Roosts

No studies elucidating the use of interim roosts by this species were found.

Foraging Habits

Although spotted bat activity has been reported over a variety of habitats, a careful review of the literature indicates that foraging *per se* is usually associated with forest clearings, meadows, and open marshy areas. Most credence was paid to those authors who specified feeding buzzes as criteria for foraging, instead of just detection of audible passes. Rabe et al. (1998) radiotracked a

lactating female who traveled 38.5km from her day roost to forage over a higher elevation (~2500m) meadow system on the Kaibab Plateau in northern Arizona. Wai-Ping and Fenton (1989) reported that in their study area in British Columbia, most foraging occurred over marshes and in open ponderosa-pine woodland. Perry et al. (1997) reported capturing lactating females over a stock pond adjacent to an open grazed meadow surrounded by mixed conifer forest and 0.4km away from cliff habitat in the Sacramento Mountains of New Mexico. Storz (1995) reported that 81.5-100% of foraging at two sites in Dinosaur National Monument occurred over open meadow. However, some authors did report foraging activity (based on audible calls; feeding buzzes not specified) of *Euderma* over riparian corridors (Navo et al. 1992; Szewczak et al. 1998). Interestingly, both Szewczak et al. (1998) and Geluso (2000) reported foraging of spotted bats around buildings surrounded by open areas. Mist-net surveys which report capture of spotted bats over ponds and streams surrounded by trees (e.g. Kuenzi et al. 1999) may not be indicative of foraging habitat.

Flight patterns during foraging are typically circular or elliptical (Storz 1995; Wai-Ping and Fenton 1989). Contrary to early reports, spotted bats typically forage throughout the night, emerging after sunset and foraging until early morning (Berna 1990; Navo et al. 1992; Perry et al. 1997; Priday and Luce 1999; Rabe et al. 1998; Storz 1995; Wai-Ping and Fenton 1989).

Prey Species

Limited data on stomach contents and scat analysis, combined with characteristics of the echolocation pulses used by *Euderma*, indicate that spotted bats feed primarily on moths (Berna 1990; Fullard and Dawson 1997; Watkins 1977).

Characteristics Of Prey Species

Freeman (1981) conducted principal components analysis of 14 cranial measurements of 41 species of vespertilionid bats and then regressed the PC loadings against a prey hardness scale. The first principal components axis related to robustness of the skull, with bats on the negative end having more robust skulls, and bats on the positive end having more "gracile skulls" (Freeman 1981). *Euderma maculatum* fell out on the first principal components axis at a value of about +0.25 indicating a mildly to moderately gracile skull. Freeman (1981) also ranked the hardness of the prey items for these 41 bat species on a scale of 1 (softest; e.g. Neuroptera and Diptera) to 5 (hardest; Coleoptera), and calculated a weighted average of the food habits for each species. According to this scheme, *Euderma* prey items had a weighted average of 2.00, reflecting the primacy of Lepidoptera in this bat's diet (Freeman 1981).

Reproduction And Development

Life History Characteristics

Because of this species' tendency toward a solitary nature, relatively little is known about the life history characteristics for this species.

Survival And Reproduction

As *Euderma* is a temperate zone vespertilionid, it is assumed that, like most other temperate vespertilionids, reproduction is limited to one offspring per year. However, there are no studies which actually monitored reproduction. Although there are anecdotal reports, such as dissections of females with one uterine horn enlarged and containing a placental scar (Watkins 1977), that

support each reproductive effort producing only one offspring, when a female reaches sexual maturity and whether or not she reproduces annually is not known. No records of longevity or survival rates were found.

Local Density Estimates

No literature was found which provided local density estimates for *Euderma maculatum.*

Limiting Factors

The primary limiting factor for this species is thought to be the availability of suitable cliff roosting sites (Pierson and Rainey 1998; Priday and Luce 1999; Storz 1995).

Patterns Of Dispersal

No studies were found which addressed dispersal in this species.

Metapopulation Structure

As mentioned above, patterns of dispersal for this species are not known. To date, no studies have addressed population genetic structure of this species. The metapopulation structure of this species is an area in need of research, as are most other aspects of this bat's biology.

Community Ecology

Predators

Watkins (1977) summarized reports of predation on released *Euderma* by kestrel, peregrine falcon, and red-tailed hawk. No reports of predation on *Euderma* in natural settings were found.

Competitors (e.g. For Roost Sites And Food)

Individual spotted bats have been reported to establish and defend foraging territories from conspecifics (Pierson and Rainey 1998; Storz 1995), although Wai-Ping and Fenton (1989) reported substantial overlap in foraging territories in British Columbia.

Parasites, Disease

Watkins (1977) indicated reports of the following ectoparasites from *Euderma*: *Cryptonyssus* sp., *Basilia rondanii* and *B. forcipata*, *Ornithodorus* sp. and *O. rossi*. No internal parasites have been reported (Watkins 1977). Rabies has been confirmed in this species (Medeiros and Heckmann 1971).

Other Complex Interactions. Include Interactions With Other Bat Species

No literature was found which addressed ecological interactions of *Euderma* with other taxa.

Roost Site Vulnerability

Pierson and Rainey (1998) characterized Euderma as a "nearly obligate cliff-roosting species." As such, they identified the following activities as potentially negatively impacting this species: highway construction, inundation by impoundments, rockfalls triggered by blasting or by natural causes, intensive recreational climbing, and over-grazing of meadows (the last is actually associated with foraging habitat, not roost sites; Pierson and Rainey 1998).

Risk Factors

Please see Roost Site Vulnerability above.

Response To Habitat Changes

Management Activities

Timber Harvest

The 2001 Phase I Amendment (US Forest Service 2001) to the Land Resource Management Plan ROD 3/97 (LRMP-ROD 3/97; US Forest Service 1997), implementing the selected alternative (Alternative 2), increased the number of acres for Commercial Thinning and Regeneration Opening, while reducing the number of acres for Overstory Removal, Shelterwood Seed Cut, and Seed Tree Cut. Increased areas of commercial thinning would not be anticipated to negatively impact potential habitat for spotted bats. Regeneration openings may provide temporary foraging areas for *Euderma* if they are within foraging distance of roosts and water sources.

No studies have been conducted which address the response of *Euderma* to stand level changes. As this species prefers open terrain for foraging and does not utilized timbered areas for roosting, one would anticipate that stand level changes resulting in more open habitats would benefit this species.

The Land and Resource Management Plan ROD 3/97 (LRMP-ROD 3/97) did address the need to protect caves for bats (page II-43). Management of cliff faces was not addressed as this species has yet to be documented for the Black Hills region.

Recreation

Pierson and Rainey (1998) identified rock climbing as a potentially having a negative impact on *Euderma* populations.

Livestock Grazing

Because this species appears to forage primarily over open terrain such as meadows and pastures (see above citations under Foraging Habits), overgrazing has been proposed as a potential risk for this species (Pierson and Rainey 1998). Although no guidelines for what constitutes "overgrazing" were provided, a reasonable measure would be if the vegetation is removed to the point that *Euderma's* prey base is impacted. No studies have been conducted to assess the impact of various grazing intensities on this species. Livestock grazing may indirectly benefit bat species through the construction of additional water sources (Chung-MacCoubrey 1996).

Mining

No studies were found which addressed the impact of mining activities on *Euderma,* although Pierson and Rainey (1998) identified rockfalls due to blasting for avalanche control as potential risk factors for this species. Rockfalls induced by blasting for other purposes, such as mining, may also, therefore, present a potential risk.

Prescribed Fire

To date, studies assessing the impact of fire regimes on *Euderma* are not available. As *Euderma* tends to forage over open meadows and woodlands, some combination of silvicultural practices with prescribed fire to create open areas and maintain herbaceous plant diversity (and, presumably therefore, promote insect prey base diversity) may benefit this species.

Fire Suppression

As mentioned above, the impact of various fire regimes on *Euderma* has not been studied directly. However, Bock and Bock (1983) reported that fires occurred naturally in the Black Hills about every 10-25 years between 1820 and 1910. Suppression of fire in this region can produce doghair stands of ponderosa pine which are not suitable roosting or foraging habitat for any bats, especially for spotted bats which tend to forage over open terrain. Thus, fire suppression in the Black Hills would probably be more of a detriment than a benefit to *Euderma,* should populations of this species ever be determined to even occur in this region.

Non-Native Plant Establishment And Control

Euderma consumes a variety of moth species. As arthropod diversity correlates with plant species diversity, this dietary variability would suggest the need for a diverse forest flora. Non-native plant establishment tends to reduce native plant diversity and could thus negatively impact the prey base for this bat.

Pesticide Application

Organochlorines used in the past (DDT, dieldrin, endrin, and heptachlor) and suspected of causing large-scale die-offs of bat populations, are now used much less widely and are not considered a major threat to bat populations (Clark 1981). While bats are often thought of as being extraordinarily sensitive to insecticides, recent research does not support this assumption (Clark 1981). No studies were found which examined the impact of organophosphate and carbamate insecticides on bats, even though the use of these compounds increased markedly in replacing organochlorines for agricultural use (Clark 1981).

In the absence of studies conducted to assess the impact of insecticides on *Euderma*, one might be able to apply the general results of such studies for *Corynorhinus townsendii*, another plecotine lepidopteran specialist. Sample and Whitmore (1993) examined the diet *of C. t. virginianus* in order to assess potential impact of gypsy moth infestation and control efforts on the prey base for this species. They concluded that both gypsy moth infestation and the most common control efforts (Dimilin and *Bacillus thuringiensis*, both of which substantially impact non-target lepidopterans) could reduce the prey base for *C. t. virginianus*; the former through reduction of foliage available to larvae of prey species, and the latter through direct reduction in lepidopteran diversity and numbers (Sample and Whitmore 1993). These authors recommended the use of highly selective viral and fungal pathogens for control of gypsy moths (Sample and Whitmore 1993).

Fuelwood Harvest

As *Euderma* is a cliff-roosting species, and forages over open terrain such as meadows, pastures, and marshes, it is not anticipated that the harvest of fuelwood would have a detrimental impact on this species.

Natural Disturbance

Insect Epidemics

No literature was found which dealt with the impact of insect epidemics on *Euderma*.

Wildfire

No literature is available which specifically addresses the impact of wildfires on populations of

Euderma. Early photographs from the Black Hills region indicated that many forested areas were more open with snags (Knight 1994). Brown and Sieg (1999) estimated fire intervals of 10-12 years in the ecotone between forest and prairie in the southeastern Black Hills, and intervals of roughly 19-24 years for more interior forest (near Jewel Cave) in the southern Black Hills. As mentioned above under Prescribed Fire and Fire Suppression, fire suppression leads to doghair stands of ponderosa pine which are unsuitable as either roosting or foraging habitats for many species of bats.

Wind Events

No literature directly addressed the effects of wind events on *Euderma*.

Flooding

No literature is available that addresses the impact of flooding on *Euderma*. However, Pierson and Rainey (1998) identified inundation of cliffs during filling of impoundments as a risk factor for this species.

Other Weather Events

The effects of other weather events on this species are not known.

SUMMARY

Euderma maculatum is found from central British Columbia, south through much of the western states, into the central portion of northern Mexico. The closest records to the Black Hills for this species are from north-central Wyoming in Big Horn, Park, Johnson and Washakie counties.

The Wyoming Natural Heritage Database lists *Euderma maculatum* as a species of concern in Wyoming (global/state rank G4/S1B,S2N) as does the Wyoming Game and Fish Department (state rank SSC2). This species is not monitored by the South Dakota Natural Heritage Program because spotted bats have not been recorded from South Dakota. In general, this species is thought to be distributed throughout the western states, locally common where suitable roosting habitat occurs, but rare overall.

Spotted bats forage primarily over open terrain, including mid- to high elevation meadows, marshes and pastures. Spotted bats have been documented to travel 10-38.5 km from their day roosts to forage. This species tends to establish and defend foraging territories from conspecifics, although in some parts of its range it occasionally displays considerable overlap between individual foraging territories. This species tends to fly in a circular or elliptical pattern 1.5m to 30m (typically around 10m) off the ground during foraging.

Little is known of the life history of this species.

REVIEW OF CONSERVATION PRACTICES

Management Practices

No management plans or other conservation practices were found for this species.

Models

No models pertaining to this species were found in the literature.

Inventory Methods

Inventory methods for bats traditionally included mist-netting over water sources, and more recently, the use of ultrasonic bat detectors. Mist-netting is limited in its effectiveness for most species by appropriate weather conditions and relative availability of water. Wind and rain make nets more visible to bats and reduce the ability to capture bats in the nets. In areas where numerous water sources are available, numbers of bats caught at any one water source can drop.

Acoustic inventory of bats provides advantages over mist-netting in that echolocating bats can be detected regardless of wind or rain. However, identification of echolocating bats to species requires the development of echolocation libraries for signal comparison, and the development of expertise on the part of the researcher in distinguishing among the echolocation sequences of the species in a given area. Incomplete call sequences can lead to erroneous species identification. A study conducted by O'Farrell and Gannon (1999) indicated that use of acoustic detection yields marginally better results for *Euderma* than capture techniques. Advances in molecular genetics are currently being implemented to facilitate determination of presence/absence based on assignment of fecal pellets from bridge and comparable roosts to species (Ormsbee et al. 2002).

Monitoring Methods

The use of Geographic Information Systems can greatly facilitate habitat monitoring, assuming the characteristics for high-quality *Euderma* habitat are known. Current information about roosting requirements for this species may not provide an adequate starting point for this form of habitat monitoring.

Methods previously discussed for determining presence/absence (mist-netting and acoustic detection) can be used indirectly for evaluating population trends and persistence. However, no models are available to predict the amount of each method required to detect various percentages of change in population size. Monitoring methods based on radio telemetry and/or mark and recapture may provide more information, but would also be very expensive, primarily in terms of personnel (time). Use of acoustic monitoring for this species is facilitated by the fact that this species echolocates in the range between 9-12kHz (Fullard and Dawson 1997) and thus is audible to the unaided human ear. Because this species displays roost site fidelity during May through June (Wai-Ping and Fenton 1989), use of exit counts during this timeframe should provide reliable indicators of population numbers.

Regardless of the methodologies employed for inventorying and monitoring, it is critical that the study be designed and conducted by individuals with first-hand experience with the various techniques and detailed understanding of their assumptions and limitations.

ADDITIONAL INFORMATION NEEDS

Distribution

Despite numerous surveys for bats in various parts of the Black Hills, spotted bats have never been detected in the region. The closest records of spotted bats are from north-central Wyoming, across a considerable expanse within which there is no roosting habitat for this species.

Occurrence of this species in the Black Hills is unlikely. Failure to detect the presence of a species is rarely accepted as proof that the species does not occur in a given area. However, given the past level of interest and effort in looking for this species in the Black Hills with no *Euderma* detected, continued "vigilance" as opposed to active surveys may be a prudent strategy.

Species Response To Stand Level Changes

No studies have been conducted which address the response of *Euderma* to stand level changes. As this species prefers open terrain for foraging and does not utilized timbered areas for roosting, one would anticipate that stand level changes resulting in more open habitats would benefit this species. Research on the response of this species to such changes is needed – in areas where *Euderma* occurs in sufficient abundance to support such studies.

Roosting Habitat Adaptability

It is well-documented that this species is a cliff-roosting species and there are no data to suggest that it has the ability to adapt to any other natural roost setting. What is currently unkown is what characteristics make a potential cliff site suitable/unsuitable for roosting by this species.

Movement Patterns

Anecdotal data suggest that this species inhabits higher elevations during the early and middle part of the reproductive season, and then migrate to lower elevations in the latter half of the summer (e.g. Geluso 2000). Focused studies to address movement patterns, in areas where the abundance of *Euderma* would support such studies, are needed.

Foraging Behavior

For a species for which so little of its life history is known, we have relatively detailed knowledge of the spotted bat's foraging behavior. Conflicting reports about the use of riparian areas for foraging indicate, however, that further delineation of foraging habitat is needed for this species.

Demography

Elucidation of the age structure of populations of *Euderma* remains to be achieved and could be critical in providing for better estimates of viability for this species.

Table 1. Priorities and cost categories of research needs.

SUBJECT	PRIORITY*	JUSTIFICATION	COST**
Distribution Summer and winter	Low	Determine extent of National Forest System to be managed for *Euderma* if it is ever determined to occur in the Black Hills	Moderate
Species Response to Stand Level Changes	Intermediate	Understand the impact of stand level changes on distribution and foraging habitat	Moderate
Foraging Behavior	Intermediate	Ensure management of all habitats required	Low
Demography and Metapopulation Structure	Intermediate	Allow predictions about habitat change on demographic and genetic structure of populations of *Euderma*	High

*Low: would refine or improve spotted bat management strategies; Intermediate: is required to develop comprehensive management strategies; High: is required to develop minimal science-based management strategies.

**Low: estimated cost $5,000-$25,000 per National Forest; Moderate: estimated cost $25,000-$75,000 per National Forest; High: estimated cost $50,000-100,000 per National Forest.

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