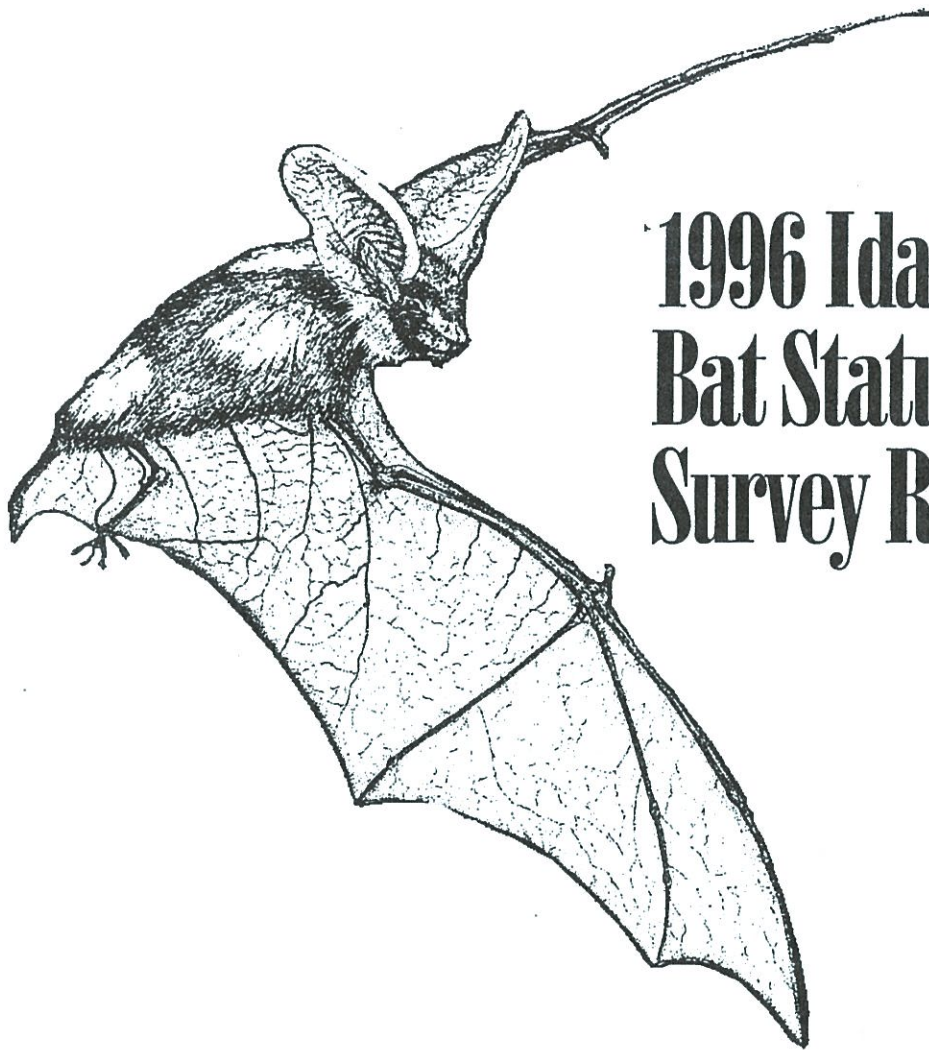
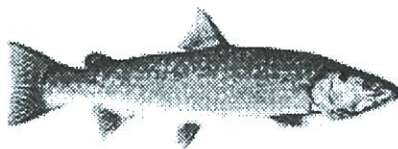




1996 Idaho Bat Status Survey Report



An interagency conservation program (Idaho Conservation Effort) was initiated in Idaho in late 1993 to remove threats and develop Conservation Agreements for species at risk of being listed as threatened or endangered. An emphasis on early conservation efforts for species at risk allows opportunities for State agencies, Federal agencies and other interested parties to stabilize or recover these species and their ecosystems before listing becomes a high priority. Addressing the conservation needs of at risk species maintains management flexibility while reducing potential conflict and restrictive land use policies. Additionally, it avoids the confrontational atmosphere that is often associated with listing, providing an ecologically sound and cost-effective means to conserve species. The primary agencies involved are the U.S. Fish and Wildlife Service, Bureau of Land Management, Regions 1 and 4 of the U.S. Forest Service, Idaho Department of Fish and Game, and Idaho Department of Parks and Recreation.

Relatively little is known regarding the distribution and status of most bat species in the state. Additional information will be needed to ensure their conservation. In 1995, an intensive effort to determine spring, summer, and fall season status, distribution, and habitat preferences for bat species in Idaho was initiated. This report reflects efforts occurring during the 1996 field season and summarizes data for both years. Hibernacula survey results for the 1996/1997 winter are also included.

This report should be cited as:

Vullo, C. et. al., 1997. 1996 Idaho Bat Status Survey Report. Idaho Conservation Effort. Boise, ID. 17 pp.

*Spotted bat and trumpeter swan illustrations courtesy of Erica Craig.
Map of Idaho with survey locations courtesy of Katy Madrid.*

1996 Idaho Bat Status Survey Report

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INTRODUCTION

Fourteen species of bats are known to occur in Idaho. Studies and surveys have been conducted in some areas of Idaho (Genter 1986; Wackenhut 1990; Lengus 1993, 1994, 1995; Keller 1994; Keller and Saathoff 1994; Lewis 1994; Cassirer 1995). However, relatively little is known regarding the distribution and status of most species in the state. During the summer of 1995 and continuing into 1996, the Bureau of Land Management (BLM), U.S. Forest Service (USFS), and the Idaho Department of Fish and Game (IDFG) began an intensive effort to determine status, distribution, and habitat preferences for bat species in Idaho (Lewis and Wackenhut 1995). During the winter of 1993, hibernacula surveys were conducted at several sites that had been previously surveyed by Wackenhut (1990). Since 1993, new hibernacula sites have been identified and placed on a 2 year survey schedule.

METHODS

Summer Surveys

Mist netting was conducted at 40 sites in Idaho from 13 May to 1 September (Fig. 1, Table 1 Appendix A). Prior to dusk, mist nets were placed near or over still or slow moving water. In some surveys, mist nets were placed at mine adit entrances. Nets were left up for a period of 1 to 8 hours. Nets were 7 to 10 feet in height, mesh size was 1.5 inches, and length varied from 18 to 60 feet depending on location. Harp traps were used exclusively at 2 mine adit sites.

Bats were extracted from the net immediately upon capture. When several bats were captured simultaneously, they were detached from the net and held in individual cloth bags until all bats were removed. Bats were identified to species, sex, and aged to either juvenile or adult. A forearm measurement was taken, and the time and date of capture were recorded on standardized forms. Other information recorded included number of nets set up, cloud cover, location, elevation, wind speed and direction, moon phase, published sunset, actual sunset, starting temperature, ending temperature, when nets were opened, when nets were closed, and habitat information. Differences in capture rates between forested and shrub-steppe habitat were compared using a Mann-Whitney nonparametric test (Zar 1984).

A survey was conducted by BLM and IDFG personnel to determine if a population of spotted bats (*Euderma maculatum*) was present in southwest Idaho. Spotted bats are the only bat in Idaho that can be identified by people when they are echolocating. Bruneau Canyon in Owyhee County was selected as the survey site because of reports of their presence in the canyon. On 6 and 7 August, teams were situated in or along the Bruneau River canyon. On 6 August, a team of 2 people listened for echolocating spotted bats at the Bruneau River scenic overlook from 2100 to 2330. A second team of 3 people hiked 0.5 mile south along the rim of the canyon from the Roberson trailhead to set up a mist net and survey for spotted bats from 2100 to 0300. A third team of 4 people hiked down to the bottom of the canyon on Roberson trail and set up mist nets and listened for spotted bats from 2100 to 0430. On 7 August, a team of 2 people surveyed a draw 4 miles south of Roberson trailhead and another team of 5 people hiked back down Roberson trail. When spotted bats were heard echolocating, information describing behavior, proximity and direction of flight were recorded.

Winter Surveys

Hibernacula surveys were conducted at 16 lava tube caves 1 alpine karst type cave, and 1 mine. Locations are not included in this report in accordance with the objectives of the 1988 Federal Cave Resources Protection Act.

Hibernacula surveys are conducted with the primary objective of obtaining a reasonably accurate count while minimizing human disturbance to bats. A

hibernacula survey team generally consists of less than 4 persons who can travel quietly and safely in a cave environment. Surveyors are careful to minimize travel noise and conversation. They avoid shining lights at bats unnecessarily and avoid getting too close to bats in low passageways. Depending on the configuration of the cave, each person counts all bats of an assigned section during ingress. Egress is done quickly and quietly with lights directed at the cave floor only. Counts are compared after exiting and a final tally is established. Bats are identified to species when possible. Banded bats and band colors are recorded.

RESULTS

Summer Surveys

Two hundred and six individual bats representing 10 species were caught and released (Table 2). All species identified in this study, were captured in multiple locations. Little brown myotis, big brown bat, small-footed myotis, and silver-haired bats were netted in the greatest number. Small-footed myotis, little brown myotis and the big brown bat were also found at the greatest number of sites in 1996. When data from 1995 and 1996 were combined (Table 3), little brown myotis and big brown bats were again caught in the greatest numbers (22.6% and 21.8% of all bats caught). The little brown myotis, small-footed myotis and big brown bat were also caught at the greatest percentage of different sites, 38.6%, 35.1% and 28.1%, respectively. Forearm lengths have been summarized by mean length and range (Table 4).

The rate of bat capture as measured by the number of bats captured per net-night, was significantly higher in forested than shrub-steppe habitats ($U = 321$, $P = 0.008$) (Table 5). With the exception of spotted and pallid bats that were caught or heard only in the shrub-steppe habitat, all species were caught in both habitats.

Two teams of resource specialists detected spotted bats by audible identification on August 6, both in and on the rim of the Bruneau River canyon. While along the Bruneau River on August 7, resource specialists heard 2 spotted bats echolocating simultaneously. Additional research in southwest Idaho completed by Bill Doering in a number of canyons in southwest Idaho also resulted in the detection of spotted bats (9 out of 14 surveyed) (pers. comm.).

All data has been summarized and sent to the Conservation Data Center (CDC) for inclusion in their data base. Additionally, all field survey forms are on file at the CDC.

Winter Surveys

Twenty hibernacula were surveyed in the 1996/1997 winter season (Table 7). Eight of these were new sites that yielded a total of 617 bats; 583 Townsend's big-eared and 34 small-footed myotis.

The remaining twelve hibernacula yielded a total of 1422 bats, about 98% Townsend's big-eared and 2% small-footed Myotis.

The largest known hibernacula site for Townsend's big-eared bats experienced a large decline in individuals from its single previous survey. In 1994, this site survey yielded 1,995 bats. In February of 1997 the surveyors counted just 1,009 bats. This decline may be the result of a late season, 1996 wildfire that consumed hundreds of acres of vegetation surrounding the site.

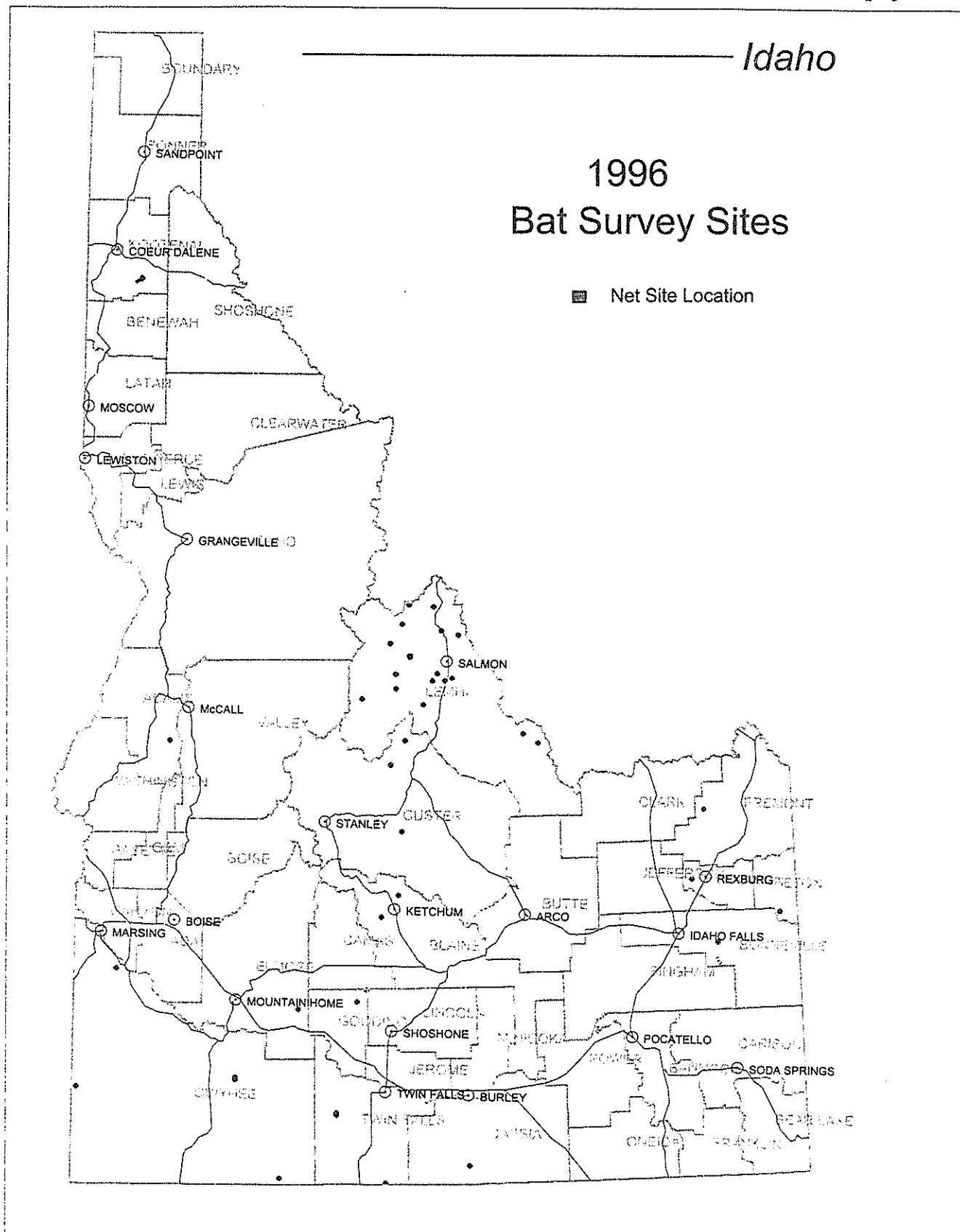


Fig. 1. Survey locations, 1996.

Table 1. Survey dates, survey locations, habitat type, species netted and numbers of individuals of each species netted in Idaho in 1996.

Date	Location	Habitat ¹	Species	n
13 May	Pond Adjacent to Jarbidge R.	S	None	0
1 Jun	Little City of Rocks	S	None	0
2 Jun	Little City of Rocks	S	Little brown myotis 1	1
3 Jun	King Hill Cr.	S	Small-footed myotis 1	1
13 Jun	City of Rocks	S	Big brown bat 9 Little brown myotis 2 Small-footed myotis 1	12
25 Jun	Killarny Lake	F	Silver-haired bat 2	2
26 Jun	Killarny Lake	F	Little brown myotis 1 Silver-haired bat 1	2
30 Jun	Thorn Creek Res	S	Small-footed myotis 2	2
3 Jul	Salmon Falls Cr. (Lily Grade)	S	Little brown myotis 2	2
9 Jul	N. Fork Owyhee R.	S	Little brown myotis 3	3
10 Jul	Reynold's Cr.	S	Small-footed myotis 2 Western pipistrelle 9	11
12 Jul	Salmon Falls Cr. (Lily Grade)	S	None	0
13 Jul	Yellowjacket Cr.	F	Big brown bat 4 Long-eared myotis 1 Silver-haired bat 7	12
14 Jul	Roseworth Pt. Pond	S	None	0
15 Jul	Warm Springs Cr.	F	Townsend's big-eared bat 2	2
16 Jul	Lake Creek	F	None	0
16 Jul	Tamarack Falls Bridge	F	Little brown myotis 9	9
20 Jul	Musgrove Cr.	F	Big brown bat 1 Long-eared myotis 1 Silver-haired bat 5	7
21 Jul	Hughes Cr. Pond	F	Big brown bat 1 Hoary bat 1 Silver-haired bat 1	3
23 Jul	Tex Cr.	S	Little brown myotis 2 Small-footed myotis 2	4

¹ F = forested, S= shrub-steppe

Table 1 (cont.). Survey dates, survey locations, habitat type, species netted and numbers of individuals of each species netted in Idaho in 1996.

Date	Location	Habitat ¹	Species	n
26 Jul	Williams Lake Rd.	F	Little brown myotis 5	5
27 Jul	Perreau Cr.	F	Hoary bat 1 Small-footed myotis 2	3
2 Aug	S. F. Williams Cr	F	Big brown bat 1 Little brown myotis 1 Silver-haired bat 7 Small-footed myotis 1	10
6 Aug	Bruneau R.	S	Small-footed myotis 1 Western pipistrelle 1 Spotted bat audible detection	2
7 Aug	Bruneau R.	S	Little brown myotis 1 Pallid bat 2 Western pipistrelle 2 Spotted bat audible detection	5
7 Aug	Dahlonge Cr.	F	Big brown bat 1 Little brown myotis 9 Silver-haired bat 2	12
9 Aug	Sand Creek Desert, (unnamed cave)	S	Townsend's big-eared bat 4	4
10 Aug	Iron Cr.	F	Small-footed myotis 2 Little brown myotis 1 Long-eared myotis 3	6
13 Aug	Shoshone Cr.	S	Little brown myotis 3 Long-eared myotis 2 Pallid bat 1 Small-footed myotis 2	8
14 Aug	Railroad Canyon	F	Little brown myotis 1 Small footed myotis 1	2
15 Aug	Fourth of July Cr.	F	Small-footed myotis 2 Townsend's big-eared bat 2	4
16 Aug	Cartier Slough WMA	S	None	0
16 Aug	Hawley Cr.	F	Big brown bat 1 Hoary bat 3 Little brown myotis 3 Small-footed myotis 1	8
17 Aug	Drake Cr.	F	Long-legged myotis 1	1
17 Aug	Panther Cr.	F	Big brown bat 9 Little brown myotis 3 Silver-haired bat 3	15

¹ F = forested, S= shrub-steppe

Table 1 (cont.). Survey dates, survey locations, habitat type, species netted and numbers of individuals of each species netted in Idaho in 1996.

Date	Location	Habitat ¹	Species	n
21 Aug	Pope-Shenan Mine	F	Small-footed myotis 3 Long-eared myotis 1 Long-legged myotis 3	7
22 Aug	Tormay Mine	F	Long-legged myotis 1 Small-footed myotis 1 Townsend's big-eared bat 4	6
23 Aug	Herd Cr.	S	Big brown bat 5	5
26 Aug	Squaw Cr.	F	Big brown bat 4 Small-footed myotis 1 Long-legged myotis 1 Long-eared myotis 1	7
27 Aug	Blackbird Cr.	F	Long-eared myotis 1	1
29 Aug	Carmen Cr.	F	Long-legged myotis 1	1
30 Aug	Challis Cr.	F	Big brown bat 8 Little brown myotis 1 Long-legged myotis 1 Small-footed myotis 1 Long-eared myotis 1	12
31 Aug	Spring Cr.	F	Big brown bat 3 Small-footed myotis 1 Long-legged myotis 1	5
1 Sep	Morgan Cr.	F	Long-legged myotis 1 Small-footed myotis 1 Big brown bat 1 Long-eared myotis 1	4

¹ F = forested, S= shrub-steppe

Table 2. Sex and age composition by species and the number of different sites an individual species was captured in Idaho in 1996.

Species	n	Sex ¹	Age ²	No. Sites
Big brown bat (<i>Eptesicus fuscus</i>)	48	23-M, 24-F, 1-E	41-A, 2-J, 4-L	13
Hoary bat (<i>Lasiurus cinereus</i>)	5	0-M, 4-F, 1-E	3-A, 1-J	3
Little brown bat (<i>Myotis lucifigus</i>)	48	16-M, 31-F, 1-E	37-A, 4-J, 6-L	17
Long-eared myotis (<i>Myotis evotis</i>)	12	5-M, 7-F	11-A, 1-J	9
Long-legged myotis (<i>Myotis volans</i>)	10	4-M, 6-F	8-A, 2-J	8
Pallid bat (<i>Antrozous pallidus</i>)	3	2-M, 1-F	2-A, 1-J	2
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	28	24-M, 4-F	23-A, 1-J, 4-L	7
Small-footed myotis (<i>Myotis ciliolabrum</i>)	28	12-M, 14-F, 2-E	20-A, 4-J, 2-L	19
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	12	6-M, 5-F, 1-E	8-A, 0-J, 3-L	4
Western pipistrelle (<i>Pipistrellus hesperus</i>)	12	3-M, 9-F	4-A, 1-J, 7-L	2

¹F = Female, M = Male, E = Escaped bat, unknown sex and age

²Age = Adult, J = Juvenile, L = Lactating adult

Table 3. The total number of bats caught and the number of different sites an individual species was captured in Idaho in 1995 and 1996.

Species	n	% of Total Bats (265)	No. of Sites ¹	% of Total Sites (57)
Big brown bat	58	21.8	16	28.1
Hoary bat	9	3.4	5	8.8
Little brown bat	60	22.6	22	38.6
Long-eared bat	17	6.4	13	22.8
Long-legged bat	13	4.9	10	17.5
Pallid bat	4	1.5	3	5.3
Silver-haired bat	30	11.3	9	15.8
Small-footed myotis	31	11.7	20	35.1
Townsend's big-eared bat	12	4.5	4	7
Western pipestrelle	24	9.1	2	3.6
Yuma myotis	7	2.6	4	7
Total	265		57	

¹sites and captures were combined between years

Table 4. Forearm length (mm) of bat species captured in Idaho in 1996. ¹

Species	n	x	Range
Big brown bat	36	47.3	39.6, 51.5
Hoary bat	4	55.9	53.7, 57.6
Little brown bat	39	36.6	32.8, 40.3
Long-eared myotis	12	38.3	36.5, 40.8
Long-legged myotis	10	40.1	38.6, 42.0
Pallid bat	3	52.7	52.2, 53.5
Silver-haired bat	14	41.8	40.1, 44.0
Small-footed myotis	26	33.2	31.2, 39.8
Townsend's big-eared bat	7	43.5	43.0, 44.2
Western pipistrelle	11	29.7	27.5, 31.7

Table 5. Capture effort in the 2 general habitat types.

	Shrub-steppe habitat	Forested habitat
No. of trapping nights	19	26
No. of nets utilized	42	54
No. of bats captured	60	146
mean bat per night	3.16	5.62
mean bat per net	1.42	2.70

¹forearm measurements were not taken for all bats caught due to processing time and stress or condition of animal

Table 6. Hibernacula survey locations, dates and number of bats counted for sites that contained more than 10 hibernating bats.

Site	Month/year	n	Species
ID540001	1/88	324	Townsend's big-eared bat
ID540001	3/88	477	Townsend's big-eared bat
ID540001	1/89	406	Townsend's big-eared bat
ID540001	1/91	448	Townsend's big-eared bat
ID540001	1/94	165	Townsend's big-eared bat
ID540001	2/96	132	Townsend's big-eared bat
ID540001	12/96	138	Townsend's big-eared bat
ID540001	1/97	220	Townsend's big-eared bat
ID540002	1/88	241	Townsend's big-eared bat
ID540002	1/89	302	Townsend's big-eared bat
ID540002	3/94	128	Townsend's big-eared bat
ID540002	12/95	104	Townsend's big-eared bat
ID540002	3/97	134	Townsend's big-eared bat
ID540003	1/88	268	Townsend's big-eared bat, small-footed myotis
ID540003	2/89	248	Townsend's big-eared bat, small-footed myotis
ID540003	12/95	109	Townsend's big-eared bat, small-footed myotis
ID340001	12/94	1,995	Townsend's big-eared bat
ID340001	2/97	1,009	Townsend's big-eared bat
ID540004	1/88	71	Townsend's big-eared bat, small-footed myotis
ID540004	2/89	62	Townsend's big-eared bat, small-footed myotis
ID540004	1/94	38	Townsend's big-eared bat, small-footed myotis
ID540004	1/96	31	Townsend's big-eared bat, small-footed myotis
ID540004	12/96	25	Townsend's big-eared bat, small-footed myotis
ID340002	3/97	220	Townsend's big-eared bat

Table 6 (cont.). Hibernacula survey locations, dates and number of bats counted for sites that contained more than 10 hibernating bats.

Site	Month/year	n	Species
ID340003	4/97	135	Townsend's big-eared bat
ID500001	3/97	160	Townsend's big-eared bat, small-footed myotis
ID340004	2/97	28	Small-footed myotis
ID540005	3/97	30	Townsend's big-eared bat
IDPA0001	3/97	29	Townsend's big-eared bat
ID540006	1/96	40	Townsend's big-eared bat, small-footed myotis

DISCUSSION

Summer Surveys

Experience gained and observations made this field season will be important in making future surveys more effective. The information provided in this report may help others with their surveys to further understand the habits of Idaho's bat species.

Fewer bats were captured per unit effort in the shrub-steppe habitat types than in forested habitat types. Most likely this occurred because winds are more frequent in shrub-steppe habitats than forested habitats. The wind blows mist nets, making them easier for bats to detect and avoid. Secondly, forested habitats have a tendency to be topographically varied relative to shrub-steppe habitats. This results in higher gradient streams with fewer pools that bats can use for drinking. Mist netting these pools is more productive since bats concentrate in these restricted areas to drink water.

Due to limited resources and the large areas that are unsurveyed the effort to survey for bats will continue. Knowledge gained will help to manage and conserve sensitive bat species. Priorities for 1997 include: 1) abandoned mine surveys to identify important bat habitats and formulate mitigation actions as mine closures occur, 2) determine the distribution of spotted bats in Idaho, and 3) bat surveys in unmanaged areas. Annual reports will continue to be published through the Idaho Conservation Effort. The priority survey areas in the state will be dictated by the Idaho Bat Working Group in coordination with local biologists, resource specialists, and other interested parties.

Winter Surveys

Substantial population declines have been documented in historic hibernacula (Lewis 1994). Although not explained, recreational cave use, vandalism and wildfires may be factors responsible for the population declines. Many hibernacula caves with significant populations are now administratively closed to winter recreational use. Organized cavers are supportive of conservation efforts and have agreed to abort cave trips when hibernating bats are discovered. New sites are being added to the survey schedule when discovered.

CONCLUSIONS

Townsend's big-eared bat

Lava beds in southern Idaho, are the most important habitat remaining for Townsend's big-eared bat. This observation is based on the number of hibernacula and number of animals using the hibernacula. The population in this geographic region is at least double the number of animals of any other geographic region within the range of this species. As a result, conservation of the animal here may dictate whether or not a listing as threatened or endangered is necessary. Efforts underway to document the complete life history of these animals may improve conservation efforts.

Spotted bat

The deep canyons of southwestern Idaho appear to be an important area for this rare, little known mammal. Efforts will continue to determine its distribution and life-history requirements in Idaho. This information will be used to manage and conserve this species.

Pallid bat

This species has been collected in Idaho infrequently. The Bruneau Dunes State Park in Idaho has been a unique and important habitat for pallid bats based on results from past survey efforts. Structural changes to buildings frequented by these bats may have affected this population. These impacts will be monitored annually.

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APPENDIX A

Bruneau River

This site is located approximately 20 miles south of the town of Bruneau, Idaho. All locations were established around the Bruneau River Canyon. There were 3 sites within 4 miles of each other. The Bruneau River Canyon is a large basalt canyon with steep cliffs towering above 700 feet. Upland vegetation consisted of mainly wyoming sage, bluebunch wheatgrass, and sandberg's bluegrass. One group packed down the Roberson trail to the Bruneau River. Poison ivy, reed canary grass, juniper and coyote willow were the dominant riparian vegetation along this reach of the river. The mist nets were set up over a wide, shallow ponded stretch of river. Another group hiked approximately 1/4 mile south on the canyon rim and set up a mist net over the upland vegetation. The second night, a group hiked down the Roberson trail and set up nets in the same area as the previous night and placed an additional net over upland vegetation along the trail. A second group listened for spotted bats in a draw approximately 4 miles south of the Roberson trailhead.

Cartier Slough WMA

This site is a wildlife management area and is situated 6 miles west of Rexburg, Idaho along the Henry's Fork River. The riparian vegetation along the slough consisted of mainly willows. The net was set up across the shallow slough adjacent to a mature cottonwood stand. No bats were seen flying in the area.

City of Rocks

This site is located 27 miles south of Burley, Idaho. It is within the City of Rocks National Reserve. The park has numerous large rocks with 200-250 foot vertical faces popular with rock climbers. The area has a diversity of vegetative plant communities. They include aspen, juniper, and sagebrush/grasslands. The mist-net site was a small livestock watering pond.

Drake Creek

Drake Creek is located 4 miles west of Victor, Idaho. The riparian vegetation consisted of mixed aspen woodlands. The site was adjacent to an open agricultural pasture. The net was set up on the top of the dam of a small pond. Numerous bats were flying over the dam and pond all evening.

Hughes Creek Pond

This site is located 22 miles north of Salmon, Idaho. The pond is adjacent to the North Fork of the Salmon River and is near the Hughes Creek Ranger Station. The riparian vegetation is comprised of cottonwood, alder and willow. Upland vegetation is comprised of Douglas-fir and ponderosa pine. Rock cliff faces are abundant.

Killarny Lake

Killarny Lake is located approximately 14 miles southeast of Coeur d' Alene. The net was placed on a dike located within the lake near the perimeter. The lake edge was marshy consisting of mainly equisetum. Ponderosa pine was the dominant conifer along portions of the perimeter of lake. The bats appeared to be foraging along the edges of timber stands and along the tree tops.

King Hill Creek

This site is located 6 miles north of King Hill, Idaho in the King Hill Creek Canyon. It is within the King Hill Wilderness Study Area and the King Hill Creek Area of Critical Environmental Concern. The upper canyon from rim to rim measures about 250 feet and the lower portion is about 500 feet deep. The upper canyon is characterized by steep vertical basalt cliffs and the lower canyon contains basalt talus slopes and sagebrush-grass habitat. Riparian vegetation at the mist-net site includes willow and dogwood. Small stands of Douglas-fir and aspen are located about 5 miles upstream of the site.

Privately owned land downstream of the site has been heavily impacted by livestock grazing. The mist nets were placed over small (less than 20 feet diameter) natural ponds along King Hill Creek. About 20 bats were observed near the mist-netting site.

Lake Creek

This site is located approximately 7 miles north of Ketchum, Idaho. The habitat within the vicinity of the mist-net site is characterized by Douglas-fir/aspen stands on the north-facing slopes and sagebrush/chokecherry/bitterbrush stands on the south-facing slopes. A series of 3 ponds, enhanced by beaver activity, is located within 300 yards of the mist-net site. Mist nets were set up across 1 adit entrance located on the south-facing slope at approximately 6800 feet elevation. These adits were inventoried for bat use during the spring of 1996; small amounts of scattered guano were found in this adit. At dusk, approximately 8-10 bats were observed foraging above the vegetation near the adit. No bats were caught, indicating that they were not using this adit. It is assumed that this is an infrequent roost site.

Little City of Rocks

This site is located 13 miles North of Gooding, Idaho. The mist net site was immediately inside a BLM Wilderness Study Area. The area has numerous rocks with vertical faces of up to 75 feet. The uplands are dominated by sagebrush/grasslands. The riparian area is subtle due in part to historic and current overgrazing. There is very little in the way of riparian plant species at the site. Water may be scarce to nonexistent in years with normal or below normal precipitation. The area appears to be very important for small-footed myotis. Several hundred bats were seen during the first mist net night and about 25 the second.

Macon Lake

This site is located 25 miles north of Shoshone, Idaho. The actual lake is about an acre in size, but there is a considerable shallow wetland associated with this lake. There is almost no physiographic relief within 2 miles of this lake. The upland vegetation surrounding the lake is comprised of sagebrush-grass. Approximately 5 bats were foraging over the deeper part of the lake.

North Fork Owyhee River

This site is located along the North Fork of the Owyhee River approximately 4 miles south of Cliffs. The mist nets were placed within the North Fork Owyhee campground enclosure about 50 yards downstream of the Mud Flat Road bridge. This open area in the canyon bottom is surrounded by nearly vertical basalt walls. Dominant riparian vegetation consists of mostly willow mixed with alder, chokecherry, golden currant, great basin wild rye, and a variety of other riparian species. Adjacent upland vegetation consists of western juniper, big sage, Idaho fescue and bluebunch wheatgrass.

Pond adjacent to Jarbidge River

This site is located approximately 2 miles northeast of Murphy Hot Springs. A mist net was set up over a pipeline fed pond in a crested wheatgrass seeding. The elevation of the pond is 5720 feet. The east fork of the Jarbidge River is located 1.5 miles to the southwest. The canyon depth exceeds 600 feet and is characterized by basalt cliffs and boulders and wyoming sagebrush/bluebunch wheatgrass habitat.

Reynolds Creek

This site is located 16 miles southwest of Nampa, Idaho. The mist net site is in a narrow rocky canyon that has vertical rock faces of up to 250 feet about a mile upstream of the mist net site. A tunnel that accommodated an irrigation canal was within 300 yards of the mist net site, but was not physically inspected. Reports to area biologists of bats in this tunnel had been made. The riparian area was narrow and comprised largely of willow.

Upland areas adjacent to the site were comprised of sagebrush/grasslands.

Roseworth Pond

Roseworth pond is located approximately 7.5 miles southwest of Castleford, Idaho, on the west side of Salmon Falls Creek. The mist-net site was over a livestock watering pond located at the edge of a burn. Wyoming sagebrush/sandberg bluegrass habitat lies between the pond and the canyon rim about 0.5 miles away. A crested wheatgrass seeding lies to the southwest of the pond. Roseworth Pond is in an allotment that is grazed by cattle from June to October. Topography is gently rolling upland with an elevation of about 4200 feet. The pond at the time of trapping was about 0.3 acres in size. A long cliff canyon which contains Salmon Falls Creek is located about 0.5 miles away. Cliffs in the canyon vary from 10 feet to over 200 feet in height and the total canyon depth exceeds 420 feet.

Salmon and Challis National Forests (sites in chronological order, include Yellowjacket Cr., Musgrove Cr., Williams Lake Rd., Perreau Cr., S.F. Williams Cr., Dahlonga Cr., Iron Cr., Railroad Canyon, Fourth of July Cr., Hawley Cr., Panther Cr., Pope-Shenan Mine, Tormay Mine, Herd Cr., Squaw Cr., Blackbird Cr., Carmen Cr., Challis Cr., Spring Cr., Morgan Cr.)

Mist nets were generally placed over streams, beaver ponds, and/or small lakes in an attempt to capture bats as they foraged and drank after leaving their day roosts. Harp traps and/or mist nets were also placed over the entrances to 7 adits at 4 different abandoned mines. Elevations of the surveyed sites ranged from approximately 3500 to 6500 feet and the actual locations of all net sites, except those over mine adits, were within riparian areas. Riparian communities most commonly surveyed included cottonwood/willow/dogwood associations with or without coniferous tree overstories. These communities were interspersed within a wide variety of surrounding habitat types, both forested and non-forested, ranging from sagebrush/bunchgrass to subalpine fir/grouse whortleberry. Coniferous overstory trees, where present, included ponderosa pine, Douglas-fir, lodgepole pine and Englemann spruce. Habitat types surrounding the surveyed mine adits included Douglas-fir/bluebunch wheatgrass, Douglas-fir/ninebark, sagebrush/bluebunch wheatgrass and mountain mahogany/bluebunch wheatgrass.

Salmon Falls Creek (Lily Grade)

This site is located 5.5 miles south of Castleford, Idaho. The mist net was placed over a wide ponded bend in Salmon Falls Creek. There are active beaver ponds upstream and downstream from the mist netting site. The canyon walls tower more than 400 feet over the creek bottom. The elevation of this site is 3680 feet. There are some steep vertical cliffs varying in height from 10 feet to over 200 feet. Wyoming sage, sandberg's bluegrass and bluebunch wheatgrass dominate the vegetation along the canyon wall. Basin big sagebrush, sandberg's bluegrass, bluebunch wheatgrass and cheatgrass dominate the canyon bottom. Willows are the dominate riparian vegetation.

Shoshone Creek

This survey site is located approximately 17 miles southeast of Rogerson on Shoshone Creek. The habitat in this area was sagebrush/grasslands. The topography of canyon was steep and bouldery with some sheer cliffs and talus basalt slopes. The depth of the canyon was approximately 150 feet. One net was placed over a pool in Shoshone Creek; a second net was placed along a sagebrush talus slope.

Sand Creek Cave

This cave is situated in a sagebrush/grassland habitat type. There are numerous lava features in the general area. The net was set up near the entrance to the lava tube cave. Several bats flew out of the cave.

Tamarack Falls Bridge

This bridge is located 3 miles southwest of Donnelly, Idaho along the Cascade Reservoir shoreline. The shoreline consisted of riparian vegetation and conifers. Two nets were set up along the east shore just south of the bridge. The bats were using Tamarack Falls Bridge as a roost site.

Tex Creek WMA

The Tex Creek wildlife management area is located 15 miles east of Idaho Falls, Idaho. The nets were set up in a willow riparian area along sagebrush/grassland uplands below a rim rock cliff. Three nets were set up in the willow riparian area over the creek. An additional net was placed among the rocks below the rim rock in the upland area.

Thorn Creek Reservoir

This site is located 18 miles north of Gooding, Idaho. The reservoir itself is approximately 200 acres in size, but has gone completely dry during periods of drought. The actual mist net site was a small pond below the earthen dam creating the reservoir. The area is extremely rocky, but does not have any vertical rock formations. Upland vegetation is comprised of sagebrush/grasslands. Much of the area was recently burned in a wildfire and has been seeded with non-native grass and forbs. Approximately 100 bats were seen the first mist net night and 1 was seen on the second.

Warm Springs Creek

This site is located approximately 6 miles west of Ketchum, Idaho. The mist-net site was associated with a mine adit surveyed for hibernating bats during the winter of 1996. The adit is located on the north-facing slope in predominantly Douglas-fir stands. One mist net was set up adjacent to Warm Springs Creek, below the adit, in willow/grass stands at approximately 6200 feet elevation. The second mist net was set up across the entrance of the mine at approximately 6400 feet elevation. Initial inventory of this mine was completed in the summer of 1995; 2 long-legged myotis were found within the mine, apparently using it as a night roost. During the 1996 survey, 2 Townsend's big-eared bats were captured close to midnight exiting the mine.