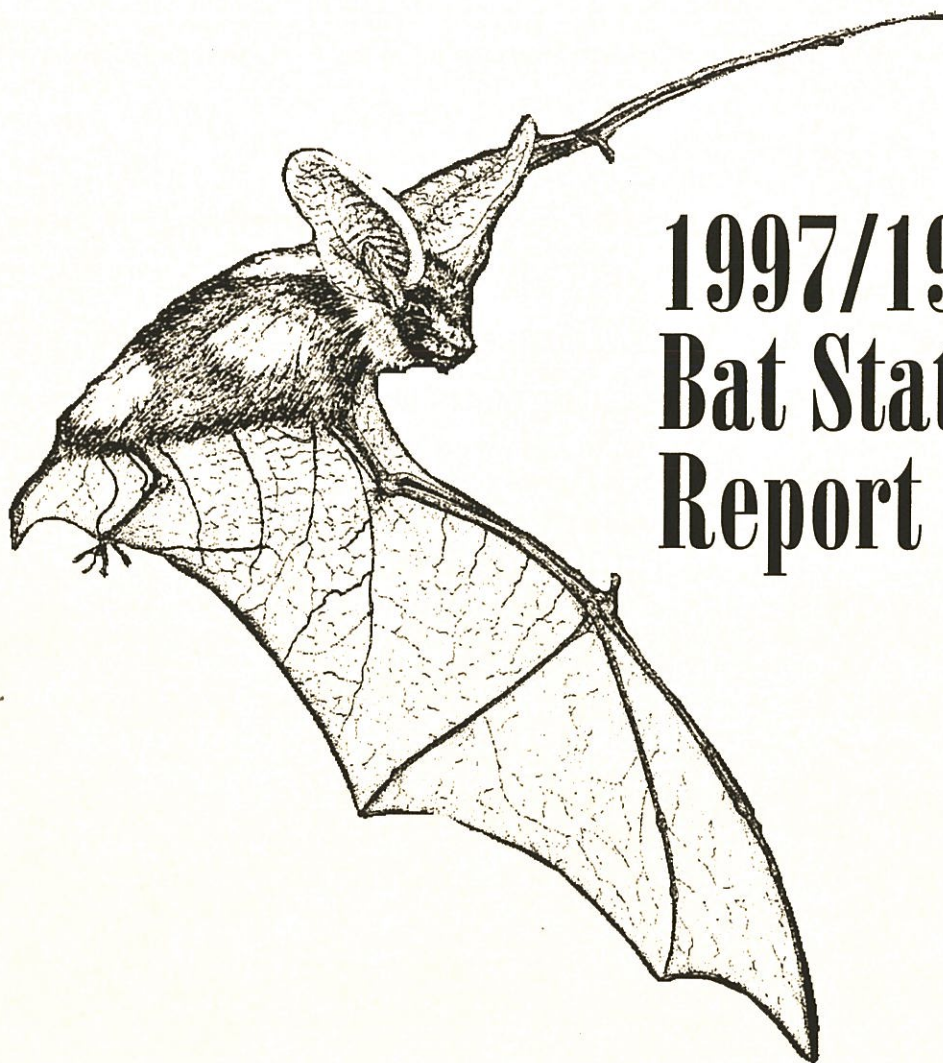
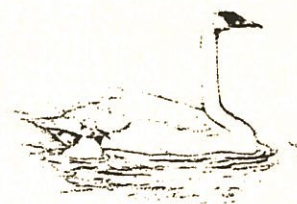
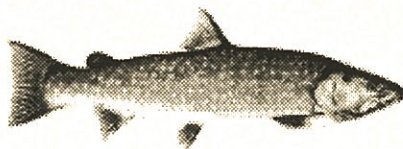




1997/1998 Idaho Bat Status Survey Report



IDAHO CONSERVATION EFFORT

The Idaho Conservation Effort (ICE) was initiated in late 1993 as a interagency species conservation program to develop proactive conservation strategies for species at risk of being listed as threatened or endangered under the Endangered Species Act (ESA) of 1973, as amended. The primary objectives of ICE are to: (1) identify and implement early conservation measures to reduce, eliminate, or mitigate those factors considered to be limiting the species' well being, (2) stabilize and recover the species and their habitats to preclude listing as "endangered" or "threatened" under the ESA, (3) recover populations of species that are listed to facilitate their removal from the list, and (4) encourage private landowners to voluntarily manage their land holdings for species of concern or to maintain or enhance habitat for those species.

An emphasis on early conservation efforts for species at risk allows opportunities for state and federal agencies and other interested parties to stabilize and recover these species and their ecosystems before listing becomes a high priority. Addressing the conservation needs of at risk species maintains management flexibility, reduces potential conflict and restrictive land use policies, avoids the confrontational atmosphere often associated with listing and provides an ecologically sound and cost-effective means to conserve species. The parties currently signatory to the 1998 ICE Memorandum of Understanding are: Idaho Department of Fish and Game, Idaho Department of Parks and Recreation, U.S. Fish and Wildlife Service, Bureau of Land Management, U.S. Forest Service Regions 1 and 4, Natural Resources Conservation Service, Boise Cascade Corporation, Potlatch Corporation, and The Nature Conservancy.

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 and 1996, 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 1997 and 1998 field season and summarizes data from all four years. Hibernacula survey results for the 1997/1998 and 1998/1999 winter are also included.

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

1997/1998 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 throughout Idaho (Keller 1981, 1992, 1995, 1997; Genter 1986; Keller and Saathoff 1996; Lengus 1996; Bohn and Keller 1997; Perkins and Peterson 1997; Doering and Keller 1998), however, relatively little is known regarding the status of most bat species in the state. Each year since the summer of 1995, the Bureau of Land Management (BLM), U.S. Forest Service (USFS), and the Idaho Department of Fish and Game (IDFG) have made an intensive effort to determine status, distribution, and habitat preferences for bat species in Idaho (Lewis and Wackenhut 1996; Vullo 1997). Hibernacula surveys were conducted during the winters of 1993 and 1995 (Lewis 1994; Lewis et al. 1996) at several sites that had been previously surveyed by Wackenhut (1990). Since 1993, a number of new hibernacula sites have been discovered. All known hibernacula are scheduled for survey every two years.

METHODS

Summer Surveys

In 1997, mist netting was conducted at 26 sites in Idaho between 9 June and 26 August and in 1998, 33 sites were surveyed between 20 June and 3 September (Table 1 and Table 2). Prior to dusk, mist nets were placed near or over still or slow moving water, outside mine adits or buildings or in perceived flyways. 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 9 to 60 feet depending on location. Harp traps were used exclusively at 2 mine sites and in conjunction with nets at numerous 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, sexed, 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.

In 1997 and 1998, 7 audible surveys were conducted near or in canyons in southwest and south-central Idaho by agency personnel, to determine the presence of Spotted bats (*Euderma maculatum*). Spotted bats may be the only bat in Idaho that produces echolocation pulses consistently within the range of human hearing. Surveys and incidental detections are noted in Table 3. Spotted bats were audibly surveyed from sunset until at least 11:30. The time, direction of flight and specific behaviors were noted on a standardized form.

Winter Surveys

Hibernacula surveys were conducted at 18 lava tube caves and 1 alpine limestone cave. Locations are not included in this report in accordance with the objectives of the 1988 Federal Cave Resources Protection Act and the extreme sensitivity to disturbance by bats at these roosts.

Hibernacula surveys are conducted with the primary objective of gathering information to assess trends in the numbers of bats. When possible, all known caves in localized areas are surveyed in one day to preclude data biases that could result from movement by bats between hibernacula. The information is obtained by making reasonably accurate counts while minimizing human disturbance to bats.

A hibernacula survey team generally consists of less than 4 people who can travel quietly and safely in a cave environment. Survey protocol includes minimizing or eliminating travel noise, avoiding shining lights directly at bats unnecessarily, and 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 away from bats that have already been counted. 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 if the information can be obtained without handling the animal.

RESULTS

Summer Surveys

Eighty three individuals of 12 species were captured in 1997 (Table 4), and 277 individuals of 13 species were captured/detected in 1998 (Table 5). Combining both 1997 and 1998, 360 individual bats representing 14 species were caught and released (Table 6). One hundred twenty seven Silver-haired bats (*Lasionycteris noctivagans*) were captured, comprising 35% of the total number of captures during the 97/98 time period. California myotis (*Myotis californicus*), Fringed myotis (*Myotis thysanodes*), Hoary bat (*Lasiurus cinereus*), Pallid bat (*Antrozous pallidus*), Spotted bat, Townsend's big-eared bat (*Corynorhinus townsendii*) and the Western pipistrelle (*Pipistrellus hesperus*) comprised less than 3% of the total bat captures during the 97/98 time period. There were a total 59 mist net and/or harp trapping nights in the 97/98 time period. Pallid bat, Spotted bat and the Western pipistrelle were captured with mist nets at 2 sites or less. Spotted bats were audibly detected at 8 locations. One audible Spotted bat detection was incidental to a mist net survey site while 7 sites were only audibly surveyed.

When data from 1995-1998 were combined (Table 7), six hundred and twenty five bats were captured over 130 trap nights at 107 distinct sites. Silver-haired bats, Little brown myotis (*Myotis lucifugus*) and Big brown bats (*Eptesicus fuscus*) were caught in the greatest numbers (25%, 17% and 18% of all bats caught). The Little brown myotis, Small-footed myotis (*Myotis ciliolabrum*) and Big brown bat were caught at the greatest percentage of different sites, 34%, 30% and 25%, respectively. Less than 10 individuals of California myotis, Fringed myotis,

Pallid bat, and Spotted bat were caught when years were combined. Though captured in 1995-7, no Hoary bats were netted in Idaho in 1998. Additionally, California myotis, Fringed myotis, Pallid bat, Spotted bat, and Western pipistrelle were caught at 5 or less sites. Spotted bats were audibly detected at 9 locations but captured at only one.

Forearm lengths have been summarized by mean length and range for both years (Table 4) .

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

Eighteen lava tubes located along the Snake River Plain were surveyed in the two winter seasons during 1997/1998 and 1998/1999. Four of these caves are showing downward population trends, and five other caves were new survey sites that contained more than 10 hibernating bats (Table 13). The remaining ten caves contained few or no hibernating bats.

DISCUSSION

Summer Surveys

Results from mist netting in the four year time period from 1995-1998 show that the Little brown myotis, Small-footed myotis and Big brown bat are apparently broadly distributed in Idaho, and occur in a variety of habitat types. The most commonly captured species were Silver-haired bats, Little brown myotis and Big brown bats. Silver-haired bats were the most commonly captured species in forested habitats.

All species known to occur in Idaho were captured in mist nets in the 1997-98 two year time period. Spotted bats were captured or audibly detected in Cassia County and Valley County, east and north of their known distribution in Idaho, respectively. Both are significant range extensions for this species in Idaho. Fringed myotis were captured in Valley and Idaho counties. These are the only known records for this species in central Idaho.

Western pipistrelles and Pallid bats appear to be primarily limited in distribution to the canyon areas of southwestern Idaho. These canyons are within arid shrub-steppe habitats less than 5000' in elevation.

The number of individuals and species we captured at individual sites was highly variable. Although not exclusive to water sources, our mist netting surveys were focused in these areas. Preference for foraging over open water varies for bat species (Fenton et al. 1980). Differences in foraging strategies by different species of bats may have influenced the species captured. Physiological differences within and between species influence the frequency they require water.

Bat captures per unit of effort is much less in Idaho than many regions in the west. Bats in Idaho are only rarely reliant on isolated water sources and instead have access to either multiple water sources or large areas of open water that precludes their concentrating at a single site.

Hoary bats, although previously thought to be fairly common and widespread, may actually be a species in need of study in Idaho. In 1995, only four individuals, all males, were netted while conducting summer mist net surveys. In 1996, only five individuals, all females, were netted, one of which was a juvenile. In 1997, five individuals, three males and two females were netted, one of which was a juvenile. In 1998, no hoary bats were netted in spite of intensified surveys. Whether this is coincidence, survey error or simply bad luck is unknown. However, it does call attention to the species and, as a minimum, should precipitate future survey efforts in areas where hoary bats have been previously netted. Of the 14 Hoary bats captured in the four year survey period, two were in shrub-steppe habitat many miles from forested habitats.

Winter Surveys

The majority of bats surveyed in the winter are Townsend's big-eared bats. Small-footed myotis are found in small numbers. Townsend's big-eared bats are considered imperiled throughout all regions in the West.

The number of bats present at the largest known hibernacula site in Idaho, ID34025, is greatly reduced since monitoring efforts were first initiated. In 1994, this cave contained 1,995 bats. In February, 1997, surveyors counted just 1,009 bats. In January, 1999, the cave contained 940 bats. The decline between 1994 and 1997 may be at least partially explained by a late season, 1996 wildfire that consumed hundreds of acres of vegetation surrounding the site. The fire may have limited forage availability when bats are normally preparing to hibernate. Some vegetative recovery had occurred between 1997 and 1999, yet numbers of bats surveyed continued to decline.

Hibernacula site ID55002 has experienced significant declines since it was first surveyed in 1988. The portion of the cave that is used by hibernating bats was protected by the construction of a bat gate in 1998 to ensure compliance with the seasonal use closure. The first winter survey after the gate was erected showed a decline from prior counts. Evidence of human disturbance (target shooting) was found immediately adjacent to the newly constructed gate. It is unknown whether the continuing decline may be a product of the new gate, to the apparent disturbance, or to other unknown factors.

Population declines of Townsend's big-eared bats are continuing at all historic hibernacula where long-term monitoring has occurred. Noncompliance with cave closures, vandalism, wildfires, and vegetative conversions may be factors that have led to these declines. Additionally, maternity roosts for this species are largely unknown as are possible impacts during this critical part of their life history. Most hibernacula caves with significant populations are now administratively closed and/or gated to prevent visitor use during hibernation. Most cavers who belong to organized grottos are supportive of conservation efforts and have agreed to abort trips

when hibernating bats are discovered in caves not administratively closed. New sites are being added to the survey schedule when discovered.

Winter weather greatly influences the ability of surveyors to access hibernacula. Some winters, few caves can be accessed because of snow or muddy conditions. Having caves on a two year survey schedule does not guarantee that caves will be surveyed at that interval. Increasing numbers of known hibernacula and limited winter survey capabilities make it unlikely that all caves will be surveyed every other year. It is likely that caves where there are management concerns or that are significant relative to other hibernacula will receive top priority for survey.

Unusual and/or Undocumented Observations

In the winter of 1996/1997, a decision was made to survey one hibernacula twice in the same winter to determine if movement occurred during winter months and the extent of variation in wintertime bat numbers. There are at least 5 caves within two miles of the hibernacula that was chosen for survey. In December of 1996, 138 bats were counted by Lyle Lewis and Paula Call and in January of 1997 220 bats were counted by Lyle Lewis and Martha Wackenhut. All three individuals had extensive experience surveying hibernacula. Surveyors counted independently and compared counts after exiting the caves. On both surveys, the independent counts were within three percent of each other. This suggests not only that bats are moving between hibernacula, but that bat numbers fluctuate when multiple caves are located proximal to each other. Since this survey, protocol was changed to survey as many caves in an area as possible within a short time-frame to reduce the variability caused by bat movement.

This same cave was also a part of a study by Wackenhut (1990) where bats were banded in the winters of 1988 and 1989. A number of banded bats were observed in the January 1997 survey. All banded bats were located in two clusters of 20-30 animals. There were approximately 6 clusters of this size and many more smaller clusters. This observation raises an interesting hypothesis whether hibernating clusters of Townsend's big-eared bats represent different age classes and whether older animals may hibernate in the larger clusters.

During a rafting trip on the main Salmon River from 2-7 September 1998 we noted 2 interesting bat observations (among the rafting party were 3 wildlife biologists from the Idaho Department of Fish and Game; Chuck Harris, John Beecham, and Don Kemner). On 2 September 1998 we observed a single Townsend's big-eared bat at approximately 1200 hours hanging on a boulder face near the pictographs at Legend Creek. We observed the bat for several minutes, after which time it flew down river about 100 m and landed on the trunk of a ponderosa pine (*Pinus ponderosa*).

On 3 September 1998 about 1600 hours, our party pulled into the Magpie Creek campsite. Circling over the river 20-30 m upstream of the campsite were 15-20 bats. We observed 2 of the bats come together over the river then flutter to the ground landing among some boulders at the base of a large ponderosa pine. We identified the bats as silver-haired bats and noted they were copulating. One of the pair flew away after less than 1 minute of observation; the second

crawled under the boulders and eventually up the trunk of the ponderosa pine. We examined this individual and determined it was a male. We placed it back on the trunk of the tree, and it climbed a little higher before taking flight. We then observed a second pair of bats come together over the river and land about 10 m up on the trunk of the same ponderosa pine in a copulatory position. A few minutes later we observed a third pair of bats come together over the river and land in the canopy portion of the same ponderosa pine. The group of bats continued their circling flight over the river while moving upstream and out of sight. Mating has been thought to take place in silver-haired bats during the fall migration period, and this may be the first documented evidence of such reproductive behavior.

On March 7, 1997, a hibernacula cave was surveyed by Charlene Vullo, David Kesner, and Paula Call. Upon approaching the cave entrance, a single bat was observed on a rock just outside the drip line of the cave. The bat was licking at a patch of snow on the rock. Due to the entrance configuration, the survey party had to pass within about 6 inches of the bat. The bat continued to lick at the snow patch and did not change position while the survey party passed. The bat was identified as a small-footed myotis. About 20 minutes later, during the survey, a bat was observed flying in the cave. It landed and crawled into a crack in the cave ceiling. Upon examination, the bat was completely out of view except for one foot. Two Townsend's big-eared bats were observed in a copulating position on the cave ceiling during this same survey. Both bats appeared to be in torpor.

CONCLUSIONS

Determining populations status, life history, and the distribution for bat species is complex due to variable movement and habitat use patterns of bats. More information is needed to successfully manage and conserve bats in Idaho. Large areas within the state still remain unsurveyed. Long term monitoring, particularly of Townsend big-eared bats, has yielded significant information regarding the status and trend of this species throughout Idaho. Issues that are important to address through additional survey efforts include: 1) identification of natural caves and abandoned mines that provide habitat for bats, 2) long term variability in use of habitats by individual species and groups of species, 3) un-surveyed areas, and 4) impacts on bat populations or habitats as the result of land management activities. Annual reports will continue to be published through the Idaho Conservation Effort.

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Table 1. Survey dates, survey locations, habitat type, species netted and numbers of individuals of each species netted in Idaho in 1997.

Date	Location	Habitat	Features	Species	<i>n</i>
8 June*	Bruneau	S	canyon		
9 June *	Bruneau	S	canyon	Spotted bat audible detection	
9 June	Pritchard Creek	MS	mine	Small-footed myotis 1	1
10 June*	Bruneau		canyon	Spotted bat audible detection	
19 June	City of Rocks	S	juniper	Big brown bat 2 Long-eared myotis 6 Spotted bat audible detection	8
25 June	Silver City	F/S		Hoary bat 2 Silver-haired bat 2	4
3 July	Big Cottonwood Canyon	S	canyon		0
9 July	Silvermoon Gulch, adits	F/S	mine	Long-eared myotis 3	3
16 July	Bruneau Dunes State Park	S	buildings	Pallid bat 3	3
17 July	Mary's Creek	S		Spotted bat audible detection	
22 July	Bob Moore Creek	F/S	rock	Long-eared myotis 1 Long-legged myotis 1 Small-footed myotis 3	5
22 July	Black Rock Adits	F	mine	Townsend's big-eared bat 1 + another observation	1
23 July	unknown mine adit	S	mine	no captures, but visual	0
23 July	Hawaiian Copper	S	mine	Little brown myotis 1 Townsend's big-eared bat 1	2
29 July	Harriman State Park	F	bat houses	Little brown myotis 2	2
30 July	Big Lost River	S	canyon		0

Date	Location	Habitat	Features	Species	<i>n</i>
5 August	Flying B, south of airstrip	S/F	rock bluffs	Big brown bat 3 Hoary bat 1 Little brown myotis 3 Silver-haired bat 6 Spotted bat 1	14
5 August	Haystack Rapids	S/F	rock	Big brown bat 2 Little brown myotis 1, 1 escape	3
6 August	Bighorn Bridge	S/F	cliff		0
6 August	Big Creek confluence	S/F	canyon		0
6,7 August	Last Chance Creek	S/F	canyon		0
7 August	Ouzel #1	S/F	canyon	Big brown bat 2 Fringed myotis 1 Little brown myotis 3 Silver-haired bat 5, 1 escape Small-footed myotis 1 Townsend's big-eared bat 1	13
7 August	Ouzel #2	S/F	canyon, burn		0
8 August	Goat Creek	S/F	cliff	Little brown myotis 4, 1 escape	4
12 August	Papoose Cave	F	cave		0
13 August	Bird Creek	F	old Ponderosa Pine	Fringed myotis 1	1
14 August*	Snake River, Murtaugh		canyon		
18 August*	Salmon Falls Creek		canyon	Spotted bat audible detection	
20 August	Kerry Purcell Mine	F	mine, springs	Small-footed myotis 2	2
20 August	Purcell Springs	F	mine, springs	Hoary bat 1 Little brown myotis 1 Yuma myotis 3	5

Date	Location	Habitat	Features	Species	<i>n</i>
26 August	Stalagpie	S	cave	Hoary bat 1 Long-eared myotis 1 Small-footed myotis 3 Townsend's big-eared bat 3 Yuma myotis 1	9

* audible survey only

Table 2. Survey dates, survey locations, general habitat type, species netted and numbers of individuals of each species netted in Idaho in 1998.

Date	Location	Habitat	Features	Species	<i>n</i>
20 June	City of Rocks	S	juniper	Big brown bat 17 California myotis 2 Long eared myotis 6 Small footed myotis 1	26
29 June	Lick Creek Adit	F	mine	California myotis 1 Long eared myotis 3 Long legged myotis 8	12
1 July	Friedorf Gulch Mine	F	mine	Long eared myotis 3 Long legged myotis 1	4
4 July	Vineyard Gulch	F	mine		0
9 July	SE Williams Creek	F			0
12 July	Jones Reservoir Area	S		Little brown myotis 1 Small footed myotis 3	4
13 July	Tamarack Falls	F	reservoir	Little brown myotis 9	9
14 July	Trail Creek	F/S		Silver haired bat 2	2
15 July	King's Bowl	S	lava rock, great rift	Big brown bat 1 Little brown myotis 2 Small footed myotis 1	4
16 July	Dougherty Gulch Stock Pond	F/S			0
17 July	Deadwater Gulch	F/S		Little brown myotis 1 Small footed myotis 1	2
18 July	Moose Creek	F	placer holes	Big brown bat 2 Little brown myotis 3 Silver haired bat 18	23
20 July	Tamarack Falls	F	reservoir	Little brown myotis 10	10
22 July	Big Desert, Houghland Allot	S		visual, small footed	0
27 July	Rabe's Pond	F		Big brown bat 1	1

Date	Location	Habitat	Features	Species	<i>n</i>
1 August	Duck Peak	F	meadow	Long legged myotis 1	1
4 August	Little Owyhee River	S	canyon	California myotis 1 Pallid bat 1 Western pipistrelle E Yuma myotis 3	5
5 August	Haynes Creek Pond	F/S		Silver haired bat 1	1
8 August	Flying B Ranch/Brush Creek	F/S	rock bluffs	Big brown bat 12 Little brown myotis 1 Long legged myotis 2 Silver haired bat 28 Yuma myotis 2	45
10 August	IMA Mine/ Patterson Creek	S	mine, rock talus	Long-legged myotis 2 Small-footed myotis 1	3
10 August*	confluence Mary's Cr. and Sheep Cr.	S	canyon	Spotted bat audible detection	
13 August	Pass Creek	F/S	rock	Little brown myotis 2 Long-eared myotis 9 Long-legged myotis 6 Silver-haired bat 1 Small-footed myotis 1	19
13 August	Reynolds Creek	S	canyon	Western pipistrelle 1	1
22 August	Whimpey Creek Mine	F	mine		0
24 August	Moose Creek, ½ mile above Ranger Station	F	Cedar old growth	Big brown bat 1 Little brown myotis 1 Silver-haired bat 16 Small-footed myotis 1 Yuma myotis 4	23
24 August	Selway River -Bridge above Moose Creek	F			0

Date	Location	Habitat	Features	Species	<i>n</i>
25 August	Seminole Ranchero	F	Cedar old growth, buildings	Big brown bat 3 Fringed myotis 1 Little brown myotis 2 Silver-haired bat 22 Yuma myotis 1	29
25 August	Moose Creek Ranger Station	F	buildings	Big brown bat 4 Long-eared myotis 2 Silver-haired bat 23 Yuma myotis 5	34
27 August	Big Hat Cr.	F/S		California myotis 1 Silver-haired bat 1 Small-footed myotis 3	5
28 August	Chilly Slough	marsh			0
29 August	Seaforth Mines	S/F	mine, rocks	Long-legged myotis 1 Townsend's big-eared bat 1	2
31 August	Pine Creek	F	canyon	Long-eared myotis 1 Long-legged myotis 4 Yuma myotis 1	6
1 Sept.	Sands Wildlife Mgt. Area	S		Long-eared myotis 2 Townsend's big-eared bat 1	3
1, 2 Sept. *	Black Leg Creek			Spotted bat audible detection	
3 Sept.	Upper Moose Cr.	F		Big brown bat 1 Silver-haired bat 3	4

incidental observation reported

Table 3. Spotted bat audible surveys in 1997 and 1998.

Date	Time	Site	EUMA detections
6/8/97		Indian Hot Springs	0
6/9/97	11:16	Bruneau River/ Sheep Cr. confluence	1
6/10/97	10:19-11:07	Bruneau River, Miller Water Draw	2
6/19/97	1:30-2:00	City of Rocks	1
7/17/97	11:11	Mary's Creek	1
8/5/97	10:53 & 11:10	Middle Fork Salmon, Flying B	1 capture* & 1 audible (simultaneously)
8/14/97		Snake River, Murtaugh put in	0
8/18/97	9:39 - 10:34	Salmon Falls Cr., north of dam	4
8/10/98**	not reported	Confluence of Mary's and Sheep Cr.	5 (2 simultaneously)
9/1/98**	not reported	head of Black Leg Cr.	0
9/2/98**	not reported	head of Black Leg Cr.	1

* captured in mist net

** incidental observation

Table 4. Sex and age composition by species and the number of different sites an individual species was captured in Idaho in 1997.

Species	<i>n</i>	Sex ¹	Age ²	No. sites
Small-footed myotis (<i>Myotis ciliolabrum</i>)	10	5-M, 5-F	4-A, 3-J, 3-L	5
Long-eared myotis (<i>Myotis evotis</i>)	11	6-M, 5-F	7-A, 1-J, 3-P	4
Little brown myotis (<i>Myotis lucifugus</i>)	17	6-M, 8-F, 3-E	7-A, 4-J, 3-P	7
Fringed myotis (<i>Myotis thysanodes</i>)	2	1-M, 1-E	2-J	2
Long-legged myotis (<i>Myotis volans</i>)	1	1-M	1-A	1
Yuma myotis (<i>Myotis yumanensis</i>)	4	2-M, 2-F	1-A, 3-J	2
Hoary bat (<i>Lasiurus cinereus</i>)	5	3-M, 2-F	2-A, 1-J, 2-P	4
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	13	11-M, 2-F	11-A, 2-E	3
Big brown bat (<i>Eptesicus fuscus</i>)	10	7-M, 3-F	9-A, 1-P	5
Spotted bat (<i>Euderma maculatum</i>)	1	1-M, audible detections	1-J	8 ³
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	6	4-M, 2-F	3-A, 3-J	4
Pallid bat (<i>Antrozous pallidus</i>)	3	3-F	1-A, 2-L	1
Totals	83			

¹F = Female, M = Male, E = Escaped bat, unknown sex and/or age²A = Adult, J = Juvenile, L = Lactating adult, P = Pregnant adult³includes audible detections sites

Table 5. Sex and age composition by species and the number of different sites an individual species was captured in Idaho in 1998.

Species	<i>n</i>	Sex ¹	Age ²	No. sites
California myotis (<i>Myotis californicus</i>)	5	4-M, 1-F	5-A	4
Small-footed myotis (<i>Myotis ciliolabrum</i>)	12	3-M, 9-F	8-A, 1-J, 3-L	8
Long-eared myotis (<i>Myotis evotis</i>)	26	16-M, 10-F	22-A, 4-L	7
Little brown myotis (<i>Myotis lucifugus</i>)	32	11-M, 21-F	16-A, 15-L, 1-?	9
Fringed myotis (<i>Myotis thysanodes</i>)	1	1-M	1-A	1
Long-legged myotis (<i>Myotis volans</i>)	25	7-M, 18-F	24-A, 1-L	8
Yuma myotis (<i>Myotis yumanensis</i>)	15	8-M, 7-F	7-A, 7-J, 1-L	5
Silver-haired bat (<i>Lasionycteris noctivagans</i>)	114	84-M, 30-F	88-A, 17-J, 8-L, 1-P	10
Western Pipistrelle (<i>Pipistrellus hesperus</i>)	2	1-M, 1-E	1-J	2
Big brown bat (<i>Eptesicus fuscus</i>)	42	28-M, 13-F, 1-E	37-A, 2-J, 2-L, 1-E	9
Spotted bat (<i>Euderma maculatum</i>)		audible detections		2 ³
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	2	2-M	2-A	2
Pallid bat (<i>Antrozous pallidus</i>)	1	1-F	1-A	1
Totals	277			

¹F = Female, M = Male, E = Escaped bat, unknown sex and/or age²A = Adult, J = Juvenile, L = Lactating adult, P = Pregnant adult³Audible detections only.

Table 6. The total number of bats caught and the number of different sites an individual species was captured in Idaho in 1997 and 1998.

Species	<i>n</i>	% of Total Bats	No. of Sites	% No. sites
California myotis	5	1.39%	4	7.02%
Small-footed myotis	22	6.11%	13	22.81%
Long-eared myotis	37	10.28%	10	17.54%
Little brown myotis	49	13.61%	15	26.32%
Fringed myotis	3	0.83%	3	5.26%
Long-legged myotis	26	7.22%	9	15.79%
Yuma myotis	19	5.28%	7	12.28%
Hoary bat	5	1.39%	4	7.02%
Silver-haired bat	127	35.28%	12	21.05%
Western Pipistrelle	2	0.56%	2	3.51%
Big brown bat	52	14.44%	12	21.05%
Spotted bat	1	0.28%	1	1.75%
Townsend's big-eared bat	8	2.22%	6	10.53%
Pallid bat	4	1.11%	2	3.51%
Total	360		57 ¹	

¹unique sites over years 1997 and 1998

Table 7. The total number of bats caught and the number of different sites an individual species was captured in Idaho in 1995-1998.

Species	<i>n</i>	% of Total Bats	No. of Sites	% No. sites
California myotis	5	0.80%	4	3.74%
Small-footed myotis	53	8.48%	32	29.91%
Long-eared myotis	54	8.64%	21	19.63%
Little brown myotis	109	17.44%	36	33.64%
Fringed myotis	3	0.48%	3	2.80%
Long-legged myotis	39	6.24%	19	17.76%
Yuma myotis	26	4.16%	11	10.28%
Hoary bat	14	2.24%	9	8.41%
Silver-haired bat	157	25.12%	21	19.63%
Western Pipistrelle	26	4.16%	3	2.80%
Big brown bat	110	17.60%	27	25.23%
Spotted bat	1	0.16%	1	0.93%
Townsend's big-eared bat	20	3.20%	10	9.35%
Pallid bat	8	1.28%	5	4.67%
Totals	625		107 ¹	

¹unique sites over years 1995-1998

Table 8. Forearm length (mm) of bat species captured in Idaho in 1997.¹

Species	<i>n</i>	<i>x</i>	Range
Small-footed myotis	8	32.0	30.9 - 32.7
Long-eared myotis	11	37.4	33.4 - 40.3
Little brown myotis	12	35.5	33.3 - 38.4
Fringed myotis	2	42.5	42.0 - 43.0
Long-legged myotis	1	39.3	39.3
Yuma myotis	4	36.3	35.1-38.8
Hoary bat	3	53.0	52.4 - 55.4
Silver-haired bat	6	41.8	41.3 - 44.0
Big brown bat	10	44.3	39 - 47.2
Spotted bat	1	51.8	51.8
Townsend's big-eared bat	6	43.2	41.6 - 44.6

Table 9. Forearm length (mm) of bat species captured in Idaho in 1998.¹

Species	<i>n</i>	<i>x</i>	Range
California myotis	5	32.9	31.8 - 35.5
Small-footed myotis	11	32.6	31.1 - 35.1
Long-eared myotis	24	38.1	33.4 - 41.3
Little brown myotis	31	36.8	34.5 - 43.5
Fringed myotis	1	43.4	43.4
Long-legged myotis	25	39.6	37 - 41.9
Yuma myotis	15	34.5	31.8 - 36.
Silver-haired bat	101	41.8	38.3 - 47.7
Western Pipistrelle	1	28.6	28.6
Big brown bat	27	45.8	37.3 - 49.9
Townsend's big-eared bat	2	44.4	43.1 - 45.6
Pallid bat	1	53.2	53.2

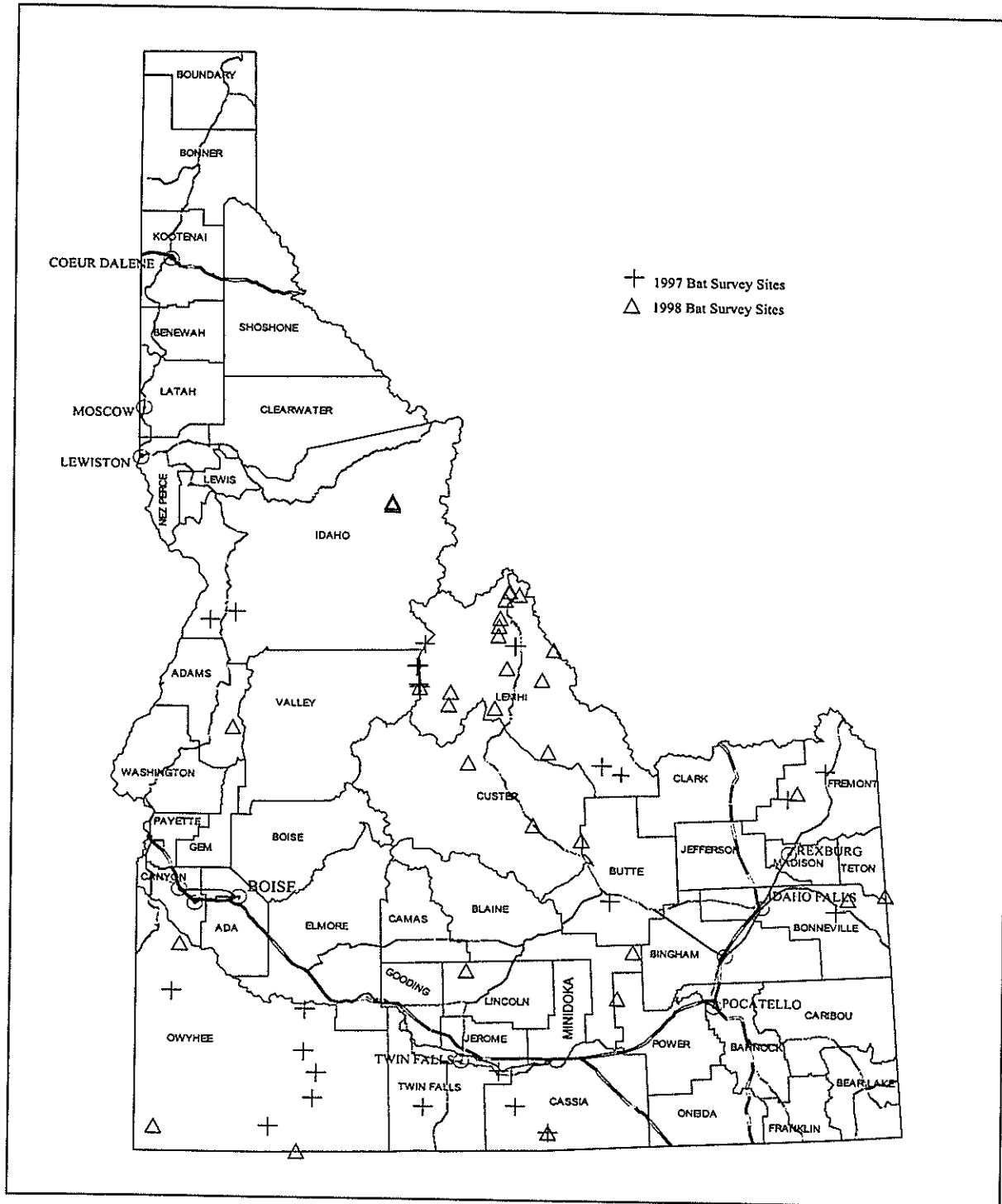
¹ forearm measurements were not taken for all bats caught due to processing time and stress or condition of animal.

Table 10. Hibernacula sites, date, and number of bats for sites with 10 or more individuals during the winters of 1997/1998 and 1998/1999, along with past records for each site.

Site	Month/year	n
ID55001	2/99	150
	1/97	220
	12/96	138
	2/96	132
	1/94	165
	1/91	448
	1/89	406
	3/88	477
	1/88	324
ID55002	2/99	80
	3/97	134
	12/95	104
	3/94	128
	1/89	302
	1/88	241
ID55003	1/98	195
	12/95	109
	2/89	248
	1/88	268
ID34025	1/99	940
	2/97	1,009
	12/94	1,995
	3/93	>1500
ID34001	1/98	135
ID34002	1/98	32
ID5PR02	1/98	35

ID34023	1/98	284
ID34020	3/98	12
IDPA001	1/99	28
	3/97	29

1997, 1998 Bat Survey Sites



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