

PLECOTUS TOWNSENDII SURVEY

FOR THE NEZ PERCE NATIONAL FOREST by

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ABSTRACT

I surveyed for Townsend's big-eared bat (Plecotus townsendii) during two seasons (summer, winter), in suitable habitat on the Nez Perce National Forest and surrounding areas. A total of 54 mines, 13 buildings, 7 caves, 17 bridges and 3 mist net sites were checked for bats. I found no E. townsendii, and encountered only one site where I found evidence to suggest their presence in the recent past. After the survey was completed, I received one additional sighting on the Salmon River between the Nez Perce and Payette National Forests. I encountered seven other bat species during this work: 1) Myotis fuscus - the big brown bat; 2) Lasiurus noctivagans - the silver-haired bat; 3) Lasiurus cinereus - the hoary bat; 4) Myotis evotis - the long-eared Myotis; 5) M. lucifuga - the little brown bat; 6) M. volans - the hairy-winged Myotis; and 7) M. yumanensis - the Yuma Myotis.

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INTRODUCTION

Townsend's big-eared bat (Plecotus townsendii) is a U.S. Forest Service sensitive species, a U.S. Fish and Wildlife Service C2 species and an Idaho Department of Fish and Game Category C species of special concern (Moseley and Groves, 1990). Hall (1980) designates four subspecies for the continental United States, two of which are federally listed as Threatened or Endangered, and two of special concern. Local distributions are not well known (Kunz and Martin, 1982), but habitat affinities have been addressed by Perkins and Levesque (1987). This bat species relies on caves or cave-like structures for hibernacula and maternity roost sites. Summer male populations appear to be scattered and day roosts are caves, mines, buildings, bridge infrastructures and large bird boxes (Perkins and Levesque, 1987). Ecology of this species' life style is noted in Appendix D.

Due to the bat's special status in Idaho, several surveys have been undertaken in selected portions of the state, mostly the south-central areas (Genter, 1985, 1986; Wackenhut, 1990). These surveys have been limited to recording of museum specimens and hibernacula searches. The purpose of this report is to summarize results of a winter and summer survey of potential roost sites in or adjacent to the boundaries of Nez Perce National Forest, Idaho. The only records for Townsend's big-eared bats on the forest were from the Martin Bridge limestone area of the Seven Devils mountains and in Hell's Canyon along the Snake river.

OBJECTIVES

The objectives of this survey were to:

1. Search all potential habitat within the forest in the summer and revisit potential hibernacula in the winter.
2. Use mist nets, bridge and night roost site surveys to detect presence of other bat species when possible.

METHODS

I surveyed in summer diurnally for bats or bat sign (scat, insect remains) in mines, caves, and buildings. Bridges were searched nocturnally for night roosting bats (see Appendix C) and an attempt was made to occasionally mist net for other bat species or use QMC bat detectors* during the first week of August, 1991. When possible, bats roosting under bridges were captured with hand nets. The sex, age, and condition of captured bats were recorded. Most bats were punch-marked in the wing to avoid counting recaptures twice. Silver-haired bats (Lasionycteris noctivagans) were banded with plastic bands or aluminum bands as part of an ongoing 10-year banding project in the Pacific Northwest. During winter (December, 1991), one or two people with lights searched mines, caves and empty buildings for hibernating bats.

*QMC bat detectors intercept calls at a set frequency (e.g. 20,000 kC, 25,000 kC). The sounds made at each frequency (ticks, puts, chirps) serve to key out the species detected.

RESULTS

A total of 7 caves, 13 buildings, 19 bridges, 54 mines and 4 mist net/bat detector sites was surveyed for bats (Appendix A). Areas sampled are identified in maps in Appendix B. No Plecotus townsendii were noted. I received a report from the Slate Creek District Ranger that he had noted P. townsendii from a cabin (night roosting) along the Salmon River between the Frank Church River-of-No-Return Wilderness and the Gospel Hump Wilderness. I did find old guano which could be attributed to P. townsendii in a mine along the Salmon River, near Slate Creek Ranger Station (T2N, R1E, S26, Butcher Bar, west side). Jerry Thornton (pers. comm.) reported noting one P. townsendii from Pappoose Cave prior to 1985. This is highly probable as there are many cliff faces and abandoned mines along the river, particularly on the Payette National Forest side (south). It is likely this bat is associated with the Hells Canyon population which is less than 10 kilometers west of Pappoose Cave. Table 1 indicates sites and results where Townsend's big-eared bats or their sign were noted.

I also encountered seven other bat species on the forest (Table 2). The silver-haired bat (Lasionycteris noctivagans) and the big brown bat (Eptesicus fuscus) were the most commonly encountered bat species. Bat sampling was somewhat biased as most sample sites were in river canyons or at elevations above 1700 meters.

Table 1. Sites on the Nez Perce National Forest and surrounding areas where existence of P. townsendii is highly likely or where sightings were made.

RANGER DISTRICT	SITE LOCATION	SIGN
Slate Creek	Pappoose Cave	1 bat [*]
Slate Creek	River of No Return	2 bats ^{**}
Slate Creek	Butcher Bar	Old Guano

* Reported by Jerry Thornton,,prior to 1985.

** Reported by Slate Creek District Ranger, January, 1992.

DISCUSSION

The findings of this study indicate that P. townsendii occurrence on the forest is peripheral and the two or three occurrences are most likely single bats not involved in reproductive activities. I noted that most mines, particularly those of the higher elevations, were caved at the entrance or the previous adit had been bulldozed away because of recent mining activities.

Initial population indicators suggest numbers of individuals are low (less than 10 on the forest proper) and thus probable occurrence of this bat species outside of the Salmon and Snake River riparian areas is extremely low.

I encourage continued efforts by NPNF field personnel in locating potential sites (caves, mines and buildings) that might be used by this species. The rationale for this is the example of the Umpqua National Forest in Oregon, where in 1990 a maternity colony believed to contain less than 20 female Plecotus was found to have over 430 females. My survey on the Nez Perce National Forest was by no means complete, and thus the bat could occur outside the river corridors.

Jerry Thornton (American Cave Conservation Society) and I have estimated Idaho's potential population of P. townsendii at less than 1200 individuals based on his field notes and findings of Genter (1985) and Wackenhut (1990). To help in managing those sites where this bat species may occur, I have included management recommendations below.

**Table 2. Additional bat species noted on the Nez Perce National Forest
Forest.**

SPECIES	SITE	# INDIVIDUALS
<u>EUtesicus fuscus</u>	T25N,R3E,S21,NW 1/4	1
	T24N,R1E,S06	2
	T30N,R5E,S25,NE 1/4	1
	Rapid River Fish Hatchery	>2
<u>Lasionycteris noctivagans</u>	T25N,R3E,S21,NW 1/4	14
	T24N,R1E,S06	1
	T30N,R5E,S25,NE 1/4	9
	Rapid River Fish Hatchery	1
<u>Lasiurus cinereus</u>	T30N,R3E,S21,NW 1/4	
	T30N,R5E,S25	
<u>Myotis evotis</u>	T28N,R8E,S25	2
<u>M. lucifugus</u>	T28N,R8E,S25	4
	Mouth Rapid River	>4
<u>M. Volans</u>	T30N,R4E,S09	1
	Mouth Rapid River	1
<u>M. vumanensis</u>	Mouth Little Salmon River	>1
TOTAL BATS OTHER THAN PLECOTUS TOWNSENDII,		47

DISCUSSION

The findings of this study indicate that *P. townsendii* occurrence on the forest is peripheral and the two or three occurrences are most likely single bats not involved in reproductive activities. I noted that most mines, particularly those of the higher elevations, were caved at the entrance or the previous adit had been bulldozed away because of recent mining activities.

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Jerry Thornton (American Cave Conservation Society) and I have estimated Idaho's potential population of *P. townsendii* at less than 1200 individuals based on his field notes and findings of Genter (1985) and Wackenhut (1990). To help in managing those sites where this bat species may occur, I have included management recommendations below.

The critical component in maintaining a viable population of this bat species (if found) is to limit human disturbance. Recommendations below are based on this premise. Human disturbance is the only common factor in all population declines of this species throughout its North American distribution. Even the best bat researchers doing only population monitoring can inadvertently disturb roosting *Plecotus*.

Buffer Zones and Site Protection

I would recommend each site (nursery and hibernaculum - see Appendix D for nursery and hibernaculum definitions) have at least a 450 ft buffer (disturbance free zone) in all directions. Directions to or even general locations (e.g., township, range & section) of sites should not be released to the public. With populations of this species on the decline, all nurseries and hibernacula are considered critical habitat.

When management activities are planned adjacent to sites, activities should be timed to avoid noise and human disturbance of bats during critical seasons. Important times for nurseries are 1 May to about 7 September; important times for hibernating bats are 1 November to 1 May. For example:

<u>ACTIVITY</u>	<u>RECOMMENDED ZONE</u>
Blasting	1/2 (0.5) mile in all directions.
Road Work	Only on existing roads, excluding blasting. Such work should be monitored if it occurs on the road to the south of the cave.

ACTIVITY

RECOMMENDED ZONE

Timber Falling
Outside Buffer

A buffer of about 450 feet in all directions from all the caves should be established. Timber falling in the cave vicinity should be during seasons when bats are not using the site.

Aerial Spraying

I would recommend that aerial spraying of insecticides, herbicides or any chemicals be banned within a 1 mile buffer during any season. The bats rely on an unpolluted insect base and may glean insects from foliage. If they do glean, herbicide ingestion would be detrimental to maintaining a viable population.

In-House Bat Surveys

New sites identified as nurseries should be surveyed in the appropriate season by a bat specialist to lessen disturbance. Entry by a competent professional can be accomplished without undue disturbance. Monitoring of nursery sites can be performed by in-house personnel with instructions from a professional. Most sites can be monitored by counting exiting bats. Quiet and established observation posts are necessary to provide comparable counts.

Hibernacula can be entered by staff biologists if they have training in cave safety, proper equipment and training in behavior designed to lessen disturbance to bats. Deschutes National Forest biologists have been successfully counting hibernating bats for the past three years with only two training trips.

Counting of bats at hibernacula also requires the ability to determine species. Suggested timing is early December. Studies show that early disturbance of *P. townsendii* results in more fat loss than that which occurs from late winter disturbances.

Protection Needed

In addition to non-disclosure of bat roost sites except on a need-to-know basis, other protection measures may be needed. The following procedures have resulted in lowering of human activity or in redirecting it to protect the bats during nursery and hibernating roost seasons:

1. Patrol by Federal police.
2. Signing of the cave (on the inside).
3. Road Closures (with sturdy gates).
4. Bat gates (a specific type has been developed if the entire entrance needs blockage from human access).

I would consider a combination of the first three procedures as a second line defense behind secrecy of sites. Gating of cave entrances is not without peril to the bats. Gating has been noted to result in changes in temperature, humidity, bat access, and number of bats willing to fly through a gate. I prefer a gate that allows bat access, restricts humans, and is mostly impervious to vandalism. Most recent gating efforts use a stainless steel bar or v-shaped bars.

PROTOCOL FOR INVENTORY AND MONITORING OF BAT ROOST SITES

Inventory Protocol at Future Sites

Plecotus townsendii is primarily a user of cave or cave-like structures. In southern Oregon and the central coast of California, this species has been known to use building attics as nursery sites. Males have been noted in attics and dark, open garages during spring and summer days in Oregon and Washington. Known winter hibernacula are all caves or mines.

To determine use of caves or cave-like structures, a minimum of two searches should be completed (winter and summer). Ease of determining bat presence varies with each site. I would strongly recommend use of a person with experience for this type of survey. Recognizing bat species without handling takes some repetitive practice, and crawling in tight cave passages or fragile mine adits requires a lack of claustrophobia, special equipment and physical skills. An inventory that minimizes bat disturbance is more likely when at least one skilled person is present.

General observer behavior should closely parallel that recommended below under Monitoring Protocol.

Monitoring Protocol

The preferred method of monitoring nursery colonies has been mentioned (counting exiting bats at sunset). If nursery sites must be entered it is best to use the following procedures:

1. Lights should have a red filter.
2. Observers should number no more than two and avoid conversation.
3. Observers should stay in a hands and knees position.
4. If more than one or two bats take flight, observers should exit.

Winter monitoring should involve two individuals for safety reasons. Too many additional observers may rapidly alter hibernaculum temperature and arouse more bats than two observers. Observers should be quiet, not spend time under bats or shining lights on them more than needed to identify and count, and

immediately exit when the count is finished. Monitoring results should be stored and compared after each count. Date of monitoring should be as consistent as possible from each year or biennium to the next.

Suggested Surveys

I suggest NPNF personnel and any other forests interested in bat surveys, continue recording locations of any caves, buildings, bridges or mist net sites for future surveys. Personnel should be alerted to look for the presence of insect parts or guano on the floor, bats in attics (or potential) and cave openings. Usually the presence of over-wintering moths or crickets indicates bats can make use of the site.

NOTES ON THE OTHER BAT SPECIES

Two of the bat species (Lasionycteris noctivagans and Lasiurus cinereus) noted are associated with old growth or with mature trees which exhibit many old growth characters (Perkins and Cross, 1988). The presence of female Lasionycteris with juveniles in Idaho complements the report of Perkins and Cross (1991) which documented migratory patterns in the Pacific Northwest. The record for Myotis evotis is notable in that little is known of its distribution and ecology. It was captured night roosting under a cement bridge, an activity that was previously noted in Oregon (Perkins, 1984). The other species noted are more common bat species, and the habitat in which they were captured is considered typical.

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Wackenhut, M. C. 1990. Bat species overwintering in lava-tube caves in Lincoln, Gooding, Blaine, Bingham and Butte Counties, Idaho with special reference to the annual return of banded Plecotus townsendii. Unpub. M. S. Thesis, Idaho State University. 64 p.

APPENDIX A

DISTRIBUTIONS

The following list contains my bat records for the area surveyed, sites surveyed, and maps from Appendix B with sites highlighted.

Table A-1. Sites surveyed for bats on the Nez Perce National Forest.

SITE	STRUCTURE	MAP #
Pappoose Cave	Cave	1
Caves near Pappoose	Cave	1
Rapid River Fish Hatchery	Buildings	1
T23N,R1E,S05	Bridges	1
T23N,R1E,S29	Bridge	1
T24N,R1E,S32	Bridge	1
T24N,R1E,S19	Bridge	1
Lucille caves	Caves	1
T25N,R1E,S02	Mines	1
Butcher Bar	Mines	1
T25N,R1E,S03	Bridge	1
Slicker Bar	Mines	2
T27N,R1E,S23	Bridges	2
White Bird	Bridge	2
T30N,R4E,S25	Mist Net	3
T30N,R4E,S09	Bridge	3
T30N,R3E,S35	Bridge	3
T29N,R4E,S22	Bridge	3
T29N,R4E,S27	Mine	3
T29N,R6E,S34	Mine	4
T29N,R6E,S35	Mine	4
T29N,R6E,S36	Mine	4
T29N,R6E,S23	Mines	4
T28N,R7E,S27	Mine	4
T28N,R7E,S34	Mine	4
T27N,R7E,S02	Mine	4
T27N,R7E,S03	Mine	4
T27N,R7E,S11	Mines	4
T26N,R7E,S11	Mine	4
T26N,R7E,S12	Mine	4
T28N,R7E,S36	Cabins	5
T28N,R8E,S06	Mine	5
T28N,R8E,S17	Mine	5
T28N,R8E,S18	Mine	5
T27N,R8E,S07	Mine	5
T27N,R7E,S12	Mine	5
T27N,R7E,S13	Mine	5
T26N,R6E,S25	Mine	6
T26N,R7E,S22	Mines	6
T26N,R7E,S27	Mines	6
T26N,R7E,S28	Mines	6
T26N,R7E,S33	Mines	6
T25N,R7E,S02	Mines	6
T25N,R7E,S03	Mine	6
T25N,R7E,S09	Mine	6

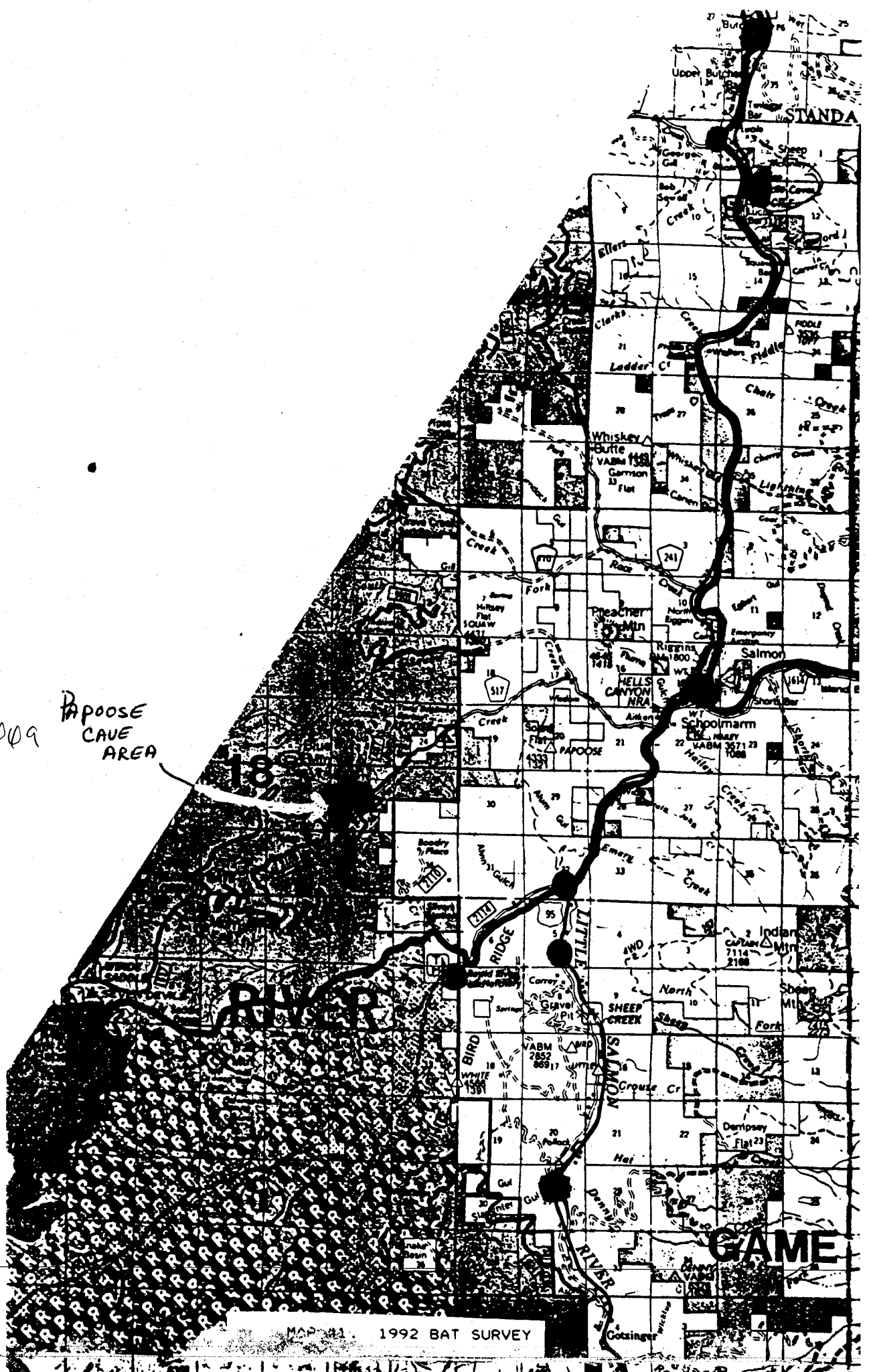
Table A-1 (cont.)

SITE	STRUCTURE	MAP #
T25N,R7E,S10	Mine	6
T25N,R7E,S32	Mines	6
	Cabins	6
T25N,R3E,S21	Mist net	*
T24N,R1E,S06	QMC Detector	*

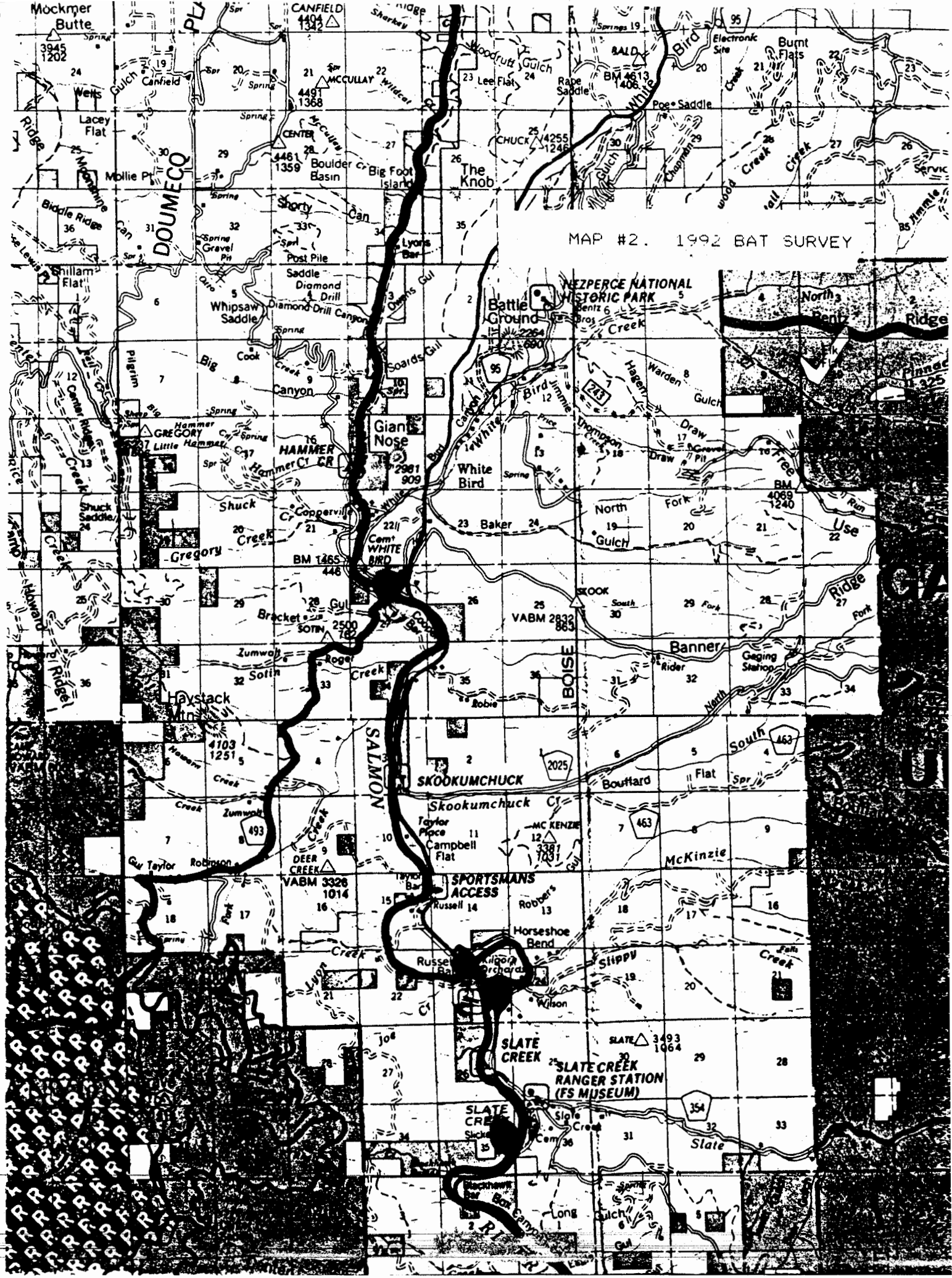
* Not on included maps.

APPENDIX B
MAP LOCATIONS FOR SAMPLE SITES
NOTED IN APPENDIX A

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PAPOOSE
CAVE
AREA



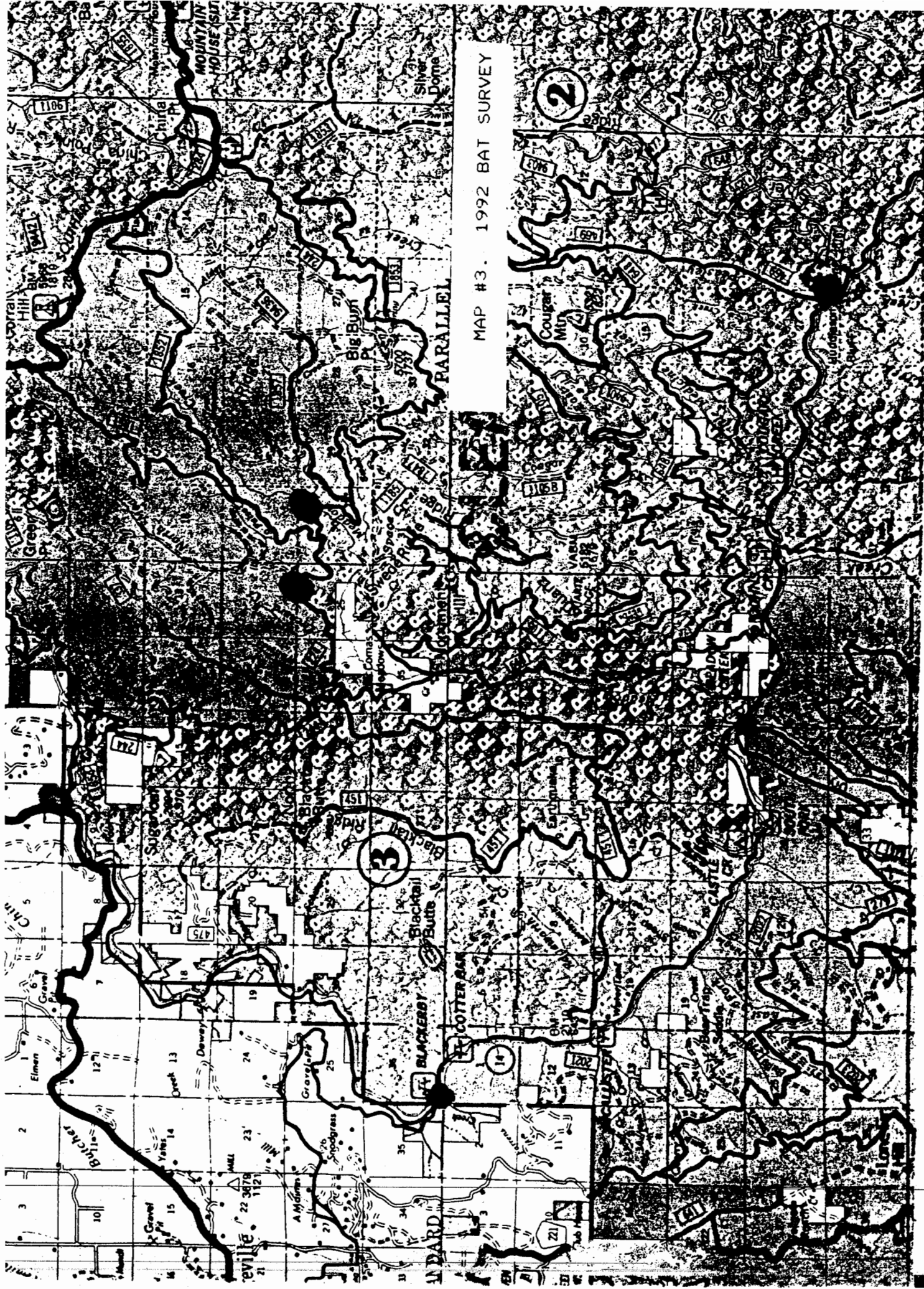
MAP #1. 1992 BAT SURVEY



MAP #2. 1992 BAT SURVEY

NEZPERCE NATIONAL HISTORIC PARK

SLATE CREEK RANGER STATION (FS MUSEUM)



MAP #3. 1992 BAT SURVEY

2

3

4

MOUNTAIN HOUSE (SIT)

PARALLEL

Big Burn

Blackrail Butte

COTTER ASK

BLACKERSBY

Courser MU

1106

1206

1172

151

151

1168

1202

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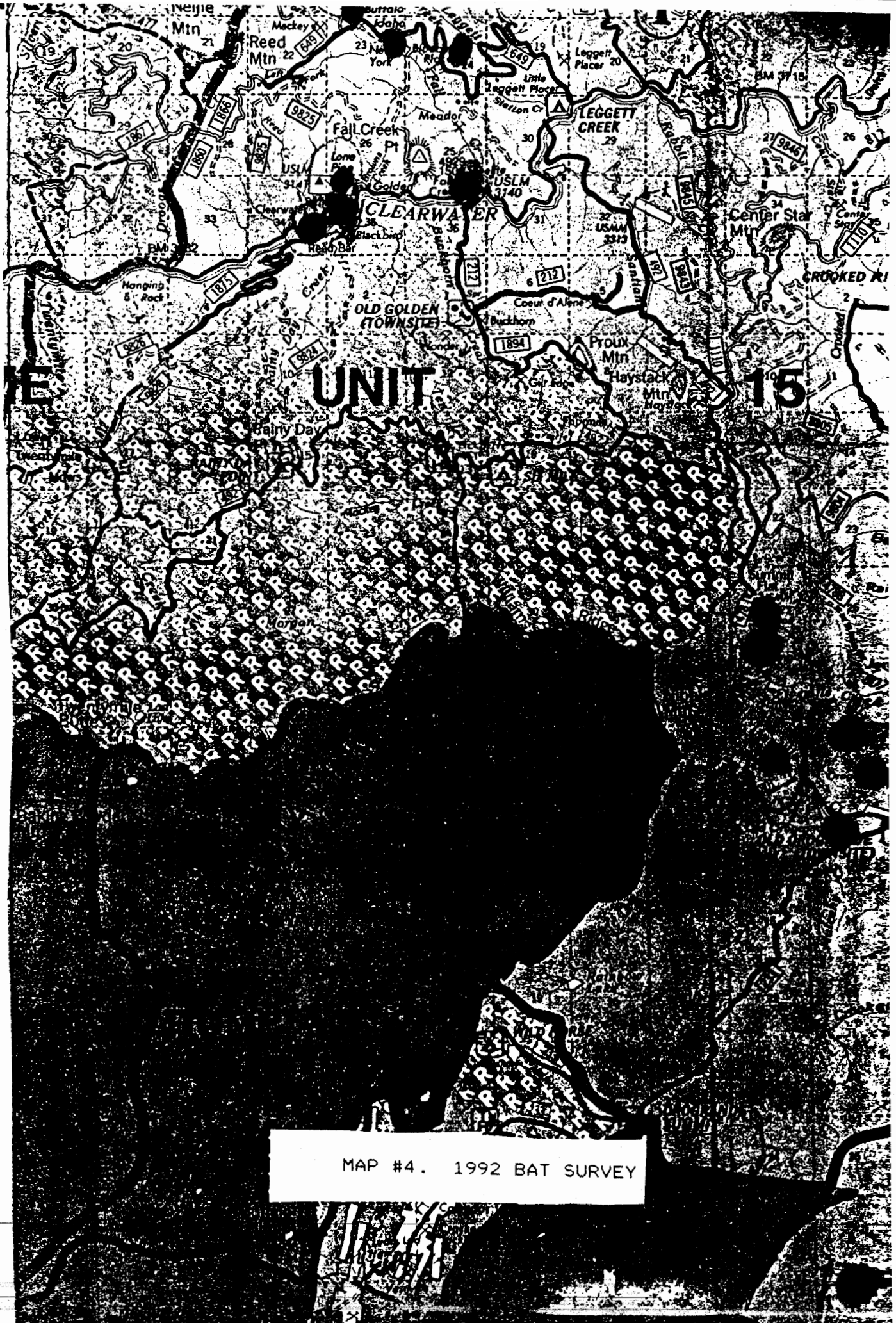
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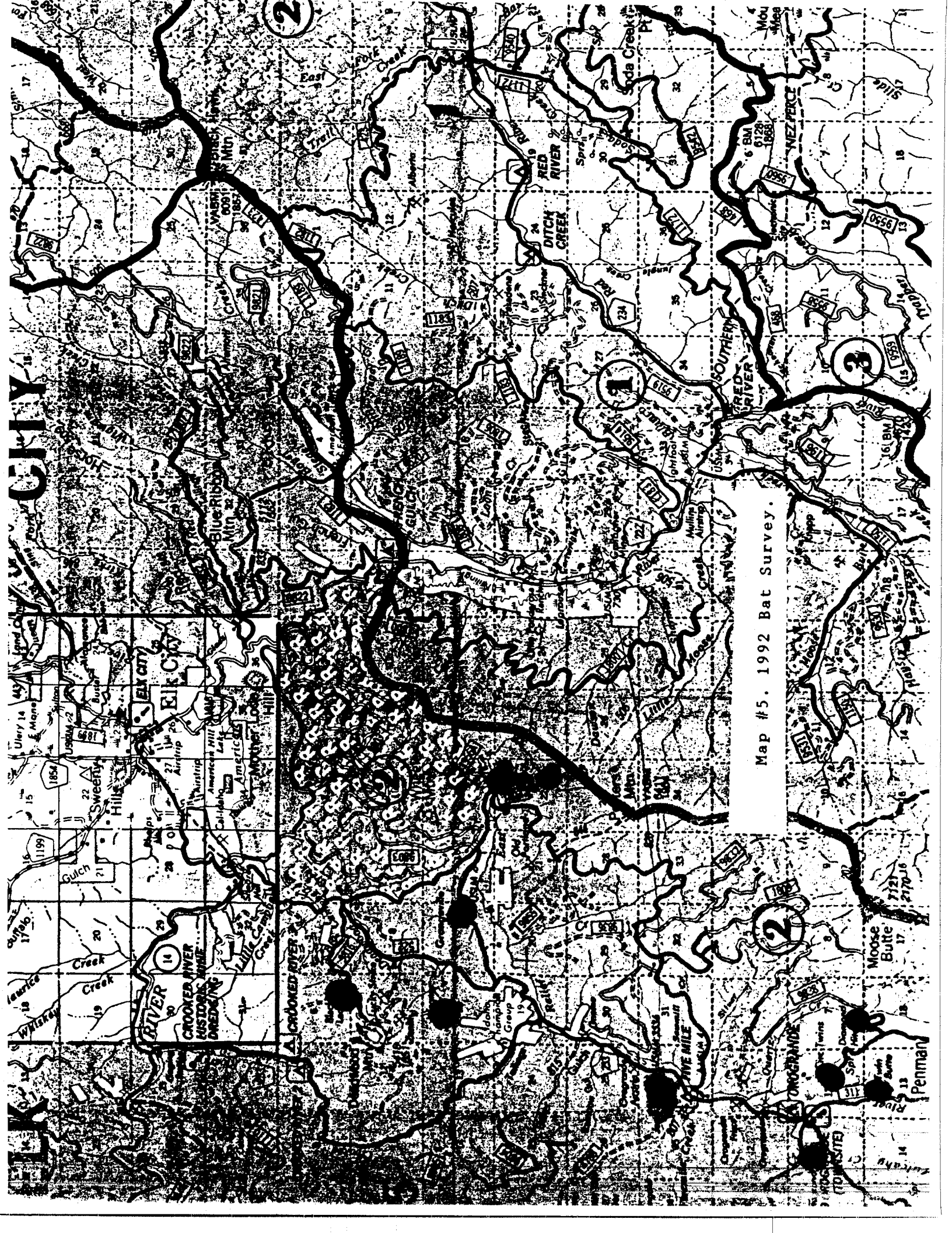
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MAP #4. 1992 BAT SURVEY



Map #5. 1992 Bat Survey.

APPENDIX D

NOTES ON NATURAL HISTORY OF PLECOTUS TOWNSENDII

Idaho Distribution

Plecotustownsendii has been extirpated from many sites in the Pacific Northwest. There is no such record as of yet in Idaho. Most known populations occur in the more southerly portions of the state. If one were to take the maximum winter counts by Wackenhut (1990) and Genter (1985, 1986) and add to it the Hell's Canyon population (shared with Oregon), the total population in 1988 was about 1471 bats. I would estimate the northern population to be much less, as the availability of habitat and the northern edge of this species distribution would serve to keep population numbers low.

Roost Site Characteristics

Most roost sites in Idaho are caves. Winter hibernacula are characterized by mostly low humidity in Oregon. Wackenhut (1990) who used a sling psychrometer noted humidities as high as 90 %. It has been my experience that sling psychrometers always inflate humidity values when used in caves with comparison with other humidity detectors. The reason being that even moderately active humans in confined spaces with low air movement quickly elevate humidity levels. Thus, those results are suspect. Preferred air temperatures also exhibit a fairly wide range (0-13.5° C.). However, in Idaho, as in Oregon and Washington, most Townsend's big-eared bats (85%) prefer caves where temperatures are less than 7° Celsius (Perkins and Levesque, 1987; Wackenhut, 1990).

Major hibernacula also have discernable air movement (multiple entrances) and preferred roosting height is less than

three meters. If most bats are on walls or ceilings where cave height exceeds three meters, it is likely they have been disturbed by humans.

No report exists on Idaho nursery caves (where females congregate in summer to bear young). Throughout the rest of the bat's range, nursery roosts are usually shallow caves or entrance zones with temperatures in the 20-25° C range. Day roost sites are usually on walls, rarely on ceilings. The females like to position their roost so that cave intruders are lit by the entering sunlight.

Male summer roosts are not well documented, but are known to include caves, mines, buildings, cliff overhangs, and abandoned train tunnels.

Submitted by: Craig R. Groves

Approved by:

IDAHO DEPARTMENT OF FISH AND GAME

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