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November 18, 2009

Dear Larry, Elizabeth, and Danielle:

We have completed the project **Bat Species Richness and Abundance at the Chiricahua National Monument and Fort Bowie National Historic Site (10th year for the 10-year project)**. I want to thank the National Park Service, Desert Southwest CESU, and the Arizona-Sonora Desert Museum for their financial support, help, and cooperation. Many people were consulted for this project and I appreciate their input, time, and comments. Please see the report for specifics concerning this project.

I have provided a hard copy of the report to those involved with this research project and the deadlines have been met for this report. Thanks again to everyone that helped make this project a success. I look forward to continuing this project in both of the parks over the next two years.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karen Krebbs'. The signature is fluid and cursive, with a large, stylized 'K'.

Karen Krebbs
Conservation Biologist

**BAT SPECIES RICHNESS AND ABUNDANCE AT THE CHIRICAHUA
NATIONAL MONUMENT AND FORT BOWIE NATIONAL HISTORIC SITE
(10th year for the 10-year project)**

Final Report for the 2009 Fieldwork

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Prepared for:

The National Park Service,
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and The Arizona-Sonora Desert Museum.



Photo 1: Townsend's big-eared bat (*Corynorhinus townsendii*).

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EXECUTIVE SUMMARY

We carried out fieldwork in May, June, and August 2009, at the Chiricahua National Monument (ChrNM) and Fort Bowie National Historic Site (FBNHS) in southeastern Arizona. Year 2009 was the tenth year of an on-going ten-year project to monitor and inventory bats for the National Park Service (NPS). A total of ten evenings of netting were spent in the two monuments at five different water sources. Two hundred eighty bats of 12 species at ChrNM and 36 bats of 4 species at FBNHS were captured in 2009. The netting sessions in May and June at the ChrNM and FBNHS are usually more productive for number of bats and species captured than the August netting. Bats appear to be more difficult to net at the two monuments once the summer monsoon rains arrive since the monsoons produce standing water enabling the bats to disperse to other areas to drink and forage. During dry periods, bats tend to congregate at the few available water sources. During the 2009 fieldwork at the ChrNM, rainfall was below normal for the monsoon period (July and August) and we captured a larger numbers of bats than normal for this period. The August rainfall (Table 11) failed to replenish water at several of the netting sites at both the ChrNM and FBNHS. Until recently, the water source at the FBNHS (Apache Springs) was a permanent spring and there was usually water at this site all summer. Apache Springs was well below normal in water volume (personal obs.) during the June and August fieldwork.

In 2009, I continued to train field helpers to assist with the fieldwork. Phil Brown (Arizona Sonora Desert Museum Employee), Austin Cockman (Arizona-Sonora Desert Museum Volunteer), and Houston Flores (volunteer) helped during the ten evenings of bat netting. Danielle Foster (Resource Manager of ChrNM) and her two sons (Ryan and Nathan) also helped with the fieldwork. The tenth year of fieldwork was completed by August 17, 2009, and the results are presented in this final report.

ACKNOWLEDGEMENTS

I want to thank the National Park Service (NPS), Desert Southwest Cooperative Ecosystem Studies Unit (Desert Southwest CESU), and the Arizona-Sonora Desert Museum (ASDM) for their support and financial contributions to this project. I also appreciate the support and input from Larry Norris. Brian Carrie, Danielle Foster, and Larry Ludwig have provided guidance, help, support, and made arrangements for camping and overnight accommodations after the evening netting. Danielle Foster updated me on weather events before the fieldwork and this was appreciated. Austin Cockman, Phil Brown, Danielle Foster, and Houston Flores helped with the bat netting and fieldwork. Pat Young and Gareth Rixton helped with rain data information.

Janet Tyburec provided records for the Bat Conservation International Bat (BCI) Workshops on the east side of the Chiricahuas for comparison to my data. The Arizona-Sonora Desert Museum (ASDM) financial department staff (Kathryn Riser and Penny

Poynter) oversaw all grant financial requirements and paperwork. I appreciate the support of Robert Edison, Dr. Richard Brusca, Dr. Christine Conte, Dr. Debra Colodner, and Marie Long. I also appreciate conversations with Angie McIntire, Tim Snow, and Janet Tyburec. Barbara Yates helped with the report copies. All the above people helped make this project successful. All photos are the property of Karen Krebbs. It is always a pleasure to work in these parks and I appreciate the opportunity to do so.

INTRODUCTION

More than 950 different species of bats are known worldwide, making up about one-quarter of all living mammals. Bats are among the most diverse and geographically dispersed group of living mammals (Kunz 1988). Bats provide essential ecosystem services including flower pollination and seed dispersal. They are also the major predators of night flying insects. Given the large volumes of insects consumed (up to 100% of body weight per night) and the long distances traveled, these bats are thought to play a major role in regulating nocturnal insect populations and in transporting nutrients across the landscape, particularly from stream corridors to tree roosts (Rainey et al. 1992). Despite the great diversity of bat species around the world and in the United States, bats are poorly studied compared to other mammals. Since bats are secretive and often elusive, the most basic natural history and ecological information has not been studied or documented for many species. Bats are threatened by habitat destruction, fragmentation, pollution, pesticides, and human ignorance. Drastic reductions in bat populations have occurred during the recent years in the United States and worldwide (Harvey et al. 1999). As human population increases, more pressure is placed on natural resources and more bat habitat has been lost.

The Chiricahua Mountains lie at a meeting place of four ecosystems: the Sierra Madre to the south; the vast Chihuahuan Desert; the warmer Sonoran Desert; and the Rocky Mountains (Parent and Scott 1994, Weldon 1993). The Chiricahuas are the most massive mountain range in southeastern Arizona and harbor the largest forested area (Parent and Scott 1994). The Chiricahua Mountains encompass sizable acreages of oak and oak-pine woodland and lesser amounts of coniferous forests in Arizona and Sonora (Gehlbach 1993). The large size of the Chiricahua Mountains and its nearness to the Sierra Madre range in Mexico mean that a wide variety of bird, animal, and plant life found nowhere else in the United States can be seen here (Davis and Russell 1995). Many plants and animals of the Sierra Madre Occidental reach the northern limit of their range in the Chiricahuas (Parent and Scott 1994). The Chiricahua National Monument (Map 1) encompasses 12,000 acres and hosts a large variety of bird, animal, and plant life unique to this area. Twenty-three of the 44 species of bats that occur in the United States and Canada have been documented in the Chiricahuas. There are an additional 20 species of bats that occur in Mexico that are not common in the United States and some of these Mexican species may be present in this mountain range. The high diversity of bat species in the Chiricahua Mountains is the result of a diversity of habitats and plants that make up this area. The Fort Bowie National Historic Site in the Dos Cabeza Mountains (Map 1) also boasts a great diversity of mammals (Roth and Cockrum 1970).

A ten-year on-going inventory and monitoring program for bats was initiated in 2000 at the ChrNM and in 2001 for the FBNHS. Many of the bat studies carried out in the past have taken place on the east side of the Chiricahua Mountains and have not included the ChrNM on the western side of this mountain range. Bat Conservation International carries out its yearly bat workshops at the American Museum of Natural History Southwestern Research Station on the east side of the Chiricahua Mountains (Tyburec 2009). The 1970 mammal survey by Roth and Cockrum at the FBNHS was the last study carried out for bats in the Dos Cabezas Mountains. Long-term studies can identify population trends and indicate how bats respond to weather extremes like drought or wet periods in these mountain ranges. Since Arizona is experiencing a long-term drought, it is essential that land managers obtain information about how animals respond to the weather extremes. Results from bat species inventory and monitoring projects can help resource managers better manage their natural resources and the animals that depend upon these resources for their survival. It is also essential for managers to know what bat species occur in these areas. In 2009, we completed the tenth year (ChrNM) and the ninth year (FBNHS) for this ten-year bat study. We surveyed five different sites for bat species diversity at selected water sources within the two parks.

OBJECTIVES

- 1) Carry out a total of ten evenings of netting for the ChrNM and the FBNHS in May, June, and August 2009.
- 2) Compare the previous years' netting data at the ChrNM (2000-2008) and the FBNHS (2001-2008) to that of 2009.
- 3) Provide a final report to the NPS, Desert Southwest CESU, and ASDM by November 30, 2009.

METHODS

Ten evenings of netting were carried out at the ChrNM and the FBNHS in southeastern Arizona during May, June, and August 2009. Standard mist nets were utilized at five different water sources to capture bats in both parks. Up to three separate 2.6 m or 6 m nets were set up at each site and monitored from dusk until midnight. We collected data for weight, species, sex, reproductive condition, external parasites, and noted other physical traits for all bats captured (Tables 1-10). All data collected was recorded on data sheets and later entered into a table for the final report. Bats were released at the site of capture after the data collection. Each of the five water sources was inventoried for one evening for the ChrNM (May) and FBNHS (June) and the netting repeated in August for each site at both parks. One to three trained volunteers assisted in the nightly netting at each site.

Chiricahua National Monument

Bats were mist netted at four sites in May and August 2009 (Tables 1-10). The netting site at the small pool north of the Bonita Canyon Campground and the Big Rock

study site were totally dry in May and August. The remaining netting sites contained water in May and August. The four netting sites were: 1) Small Pool in the drainage parallel to the road, 228 m (249 yards) north of Bonita Canyon Campground (BCC), 2) "Old Pump" 2.4 km (1.5 mi) north of BCC, 3) "Big Rock and Small Stream" near park offices and south of BCC, and 4) Silver Spur Creek below the meadow and south of BCC.

One site was netted per evening. Two to three separate nets were set up at each site. The ends of the net were placed on 3 m (10 ft) poles (two-5 ft. poles on top of each other), hung over the water, and attached to another 3 m pole on the opposite side of the water. The nets were opened as early as 1900 hours and closed as late as 2420 hours. Each location had at least two people processing the bat capture and count. Each bat caught in the net was processed immediately and released. We also recorded bat vocalizations for some of the bat species.

Fort Bowie National Historic Site

Bats were mist netted at Apache Springs in the FBNHS (Tables 5 & 10). Apache Springs is located between the Visitor Center and the Cemetery at FBNHS. This site was monitored for bats in 2001 through 2008. Until recently, Apache Springs had been a reliable source of water each year but the floods in 2006 changed the channel and the volume of water decreased. Two nets were set up at this site for one evening in June and August 2009. The nets were opened as early as 1900 hours and closed as late as 2400 hours. This site had at least two people processing bats and all bats were released after the data collection. In the past years (2001, 2002, 2003) we have only inventoried bats in June at the FBNHS. In 2004, we began to inventory bats in both June and August so that the data would be consistent with that for the ChrNM where we net bats before and during the summer monsoon rains.

RESULTS

Tables 1-10 present the raw data from the ten evenings of bat mist netting at the ChrNM and the FBNHS for 2009. Included in each table are the data that was taken on each bat captured in the nets. Tables 11 to 15 summarizes the rainfall data for the ChrNM, ChrNM bat summary data for 2000-2009, FBNHS bat summary data for 2001-2009, abbreviations, and netting location data. Table 14 explains the abbreviations for bat species, netting locations used in Figures 3, 4, and 6 for both the ChrNM and the FBNHS, and total number of bats captured by species. Over the past ten years, a total of 1,904 bats of 17 species (Tables 12 and 13) have been captured at the ChrNM and the FBNHS.

Chiricahua National Monument

A total of 280 bats of 12 species (Table 12) were captured at the ChrNM in 2009. During the past ten years, we have captured a total of 17 species (Figure 6) and 1,747 bats at the four netting sites in the ChrNM (Table 12, Figure 6).

Fort Bowie National Historic Site

At the FBNHS, a total of 36 bats of four species (Table 13) were captured over two evenings in 2009. Over the past nine years, we have captured 10 species (Figure 4) and 157 bats at the FBNHS (Table 13, Figures 2, 4). In 2005, we captured two new species (*Leptonycteris curasoae* and *Corynorhinus townsendii*) to this area (Table 13). In August 2007, our netting efforts only produced one bat (*Leptonycteris curasoae*). In 2007, we captured more individual bats (43) than we had for any year in the past (Table 13). Cave myotis (*Myotis velifer*) appears to be the most numerous bat species captured (Table 13) in this area over the past eight years but there is a maternity roost for this species within the park. Our 2009 netting attempts produced a new species (Mexican long-tongued bat, *Choeronycteris mexicana*, Photo 5) for Apache Springs. We usually capture the Mexican long-nosed bat at the ChrNM but have never captured this species at FBNHS until this year.



Photo 2: Hoary bat (*Lasiurus cinereus*).

DISCUSSION

We accomplished all of our objectives for the 2009 bat inventory and monitoring program at the ChrNM and the FBNHS. Year 2009 was another exciting year for the ten-year bat monitoring and inventory project at the two parks. We carried out ten evenings of netting at five different water sources in the ChrNM and the FBNHS in southeastern Arizona. Our 2009 data at the ChrNM indicated that this year's total number of bats captured was only exceeded by one other year (2003) for the highest in number of bats captured over the past ten years (Table 12). We continue to experience a drought in Arizona even after the above normal rainfall for 2006 and excellent monsoon seasons for 2007 and 2008 (Table 11) in the summer months in Arizona. Water sources have appeared to shrink each year in the ChrNM (personal observation) even though all four netting sites retained some water until August 2005. During the past few years, we have not utilized the larger nets over the water sources since the smaller net (2.6 m) has been adequate for the shrinking water sites.

During 2009, the summer rain (April-August) was minimal (Table 11). In 2006, three of the five study areas were dry during the May and June bat netting, one site was dry during May 2008, and two of the study sites totally dry in May 2009 (Table 1 & 4). Bats utilize water sources for drinking, to catch insects, and as travel corridors. Bats appear to congregate at water sources during drier periods and when water is not as abundant. Insects also seek out areas of standing water during periods of drought and when water is scarce. Bats have been more difficult to capture (results from this study) when there is more water available but as the drought continues, there does not seem to be a significant difference in number of bats captured versus rainfall as in 2003 (Figure 5). Bats have more options for water sources in wet years. The Small Pool and the Rock locations were entirely dry during May and August 2009 and we did not capture any bats at these two study sites. In the past, sites that were totally dry in May usually had water in August when the monsoons rains arrived but over the past several years the dry sites have remained dry during and after the summer rains. At the beginning of this project (2000) it was not uncommon to capture up to 20 bats of seven to eight different species at both of these locations (Small Pool and Rock). The Silver Spur Creek and the Old Pump sites continue to contain water during the drought and are also the two best sites to capture bats (Figure 6).

Until recently, Apache Springs (AS) at the FBNHS has been a reliable year-round water source. The floods of 2006 and recent clearing of vegetation (2005-2006) had open the area and allowed larger species like lesser long-nosed and Townsend's big-eared bats (*Leptonycteris curasoae yerbabuenae*, *Corynorhinus townsendii*, Table 13) to utilize this drainage. Larger bats may not been able to maneuver in this crowded space and this may explain why larger species have not been captured at this site before 2005. Opening up this area probably allowed the larger species (Table 13, Krebs 2005 NPS Report) sufficient space to drink water at this spring. In 2009, we captured another new species at AS (Mexican long-tongued bat, *Choeronycteris mexicana*, Table 10 & 13). In 2007, there was a noticeable difference (decrease in level) in water at AS. Since 2007, the spring has not been as reliable as in past years. In 2008, there was more water volume in June than for August but the water level was lower than normal for both months. For the past two years, we have captured more cave myotis bats than for any other species. There is a maternity roost for this species in the ice cave at the fort and it appears that this species is utilizing the water at AS. Since the water volume is lower now at AS, the other species of bats (Table 13) may be drinking at another water source or may be avoiding the competition from the cave myotis.

We captured more than 200 bats at the ChrNM in each of 2003, 2004, and 2009 (Table 12). This is almost more than twice as many bats captured for each of the previous three years. The extended drought may have contributed to the high number of bats captured in these three years. In 2005, we captured a total of 195 bats at the ChrNM and probably would have netted a higher number of bats if rain had not spoiled several of the netting sessions. In 2006, a total of 114 bats were captured at the ChrNM and was lower than the previous four years but the capture of only one individual bat in August contributed to this lower number. The rainfall during July and August 2006 was high and

bats were difficult to capture during this time supporting the hypothesis that bats are more difficult to capture during wetter times.

For the past seven years, and with the exception of 2002, 2006, and 2008, we have captured hoary bats (Photo 2) at the ChrNM. Hoary bats roost in the foliage of trees and are considered one of Arizona's tree bats (Monday 1993). All five hoary bats captured in May 2005 were males but five pregnant females were netted in May 2004 at the ChrNM. It would be difficult to say if these females were resident or migrating through our area for more northern latitudes. It is not known if young are born in Arizona and we have not captured any lactating females during this project. Females have been taken in Arizona in April, May, July, August, October, and December (Hoffmeister 1986). Hoffmeister states that females are present longer in Arizona than for bats that are just migrating through the state in April and May. In southeastern Arizona hoary bats may be present year-round (Hoffmeister 1986). We rarely net hoary bats in August but in 2009 we captured one male hoary bat at the Old Pump site (Table 7) where we also captured the only hoary bat in May for the year.

Large numbers of the tree bat, silver-haired bat (*Lasionycteris noctivagans*), were netted at the ChrNM in 2003, 2004, and 2009 compared to previous years (Table 12). All the silver-haired bats were captured in May, June, and July and not in the August netting sessions. We captured 42 silver-haired bats in May for 2009. Silver-haired bats are considered to be a highly migratory (Barbour and Davis 1969, Cryan 2003) and perhaps explaining why this species was captured in May and June. Previous studies or reports for this species in the Chiricahua Mountains (Allen 1895, Cockrum and Ordway 1959, Cahalane 1939, Hoffmeister 1986, Schmidt and Dalton 1994) indicate that it is primarily netted in May and June in the summer and during the winter months in this area. We have captured eight females over the past 10 years and all appeared pregnant. During the birth period in June and July, adult males appear to reside in areas apart from those occupied by adult females (Nowak 1994). There is little information about the movements of females through this area. A male silver-haired bat was captured that had a partially healed broken finger (Photo 6, Table 4) and the bat's weight was normal.

Over the past six years, with the exception of 2006 (Table 12), we have captured more Western pipistrelle (*Pipisterellus hesperus*, Photo 7) than for the previous years. Western pipistrelles are slow flyers and it is sometimes difficult to capture this species in the nets. In Arizona, they can be found in all types of habitat scattered throughout the state, except for the northeastern corner (Monday 1993). During conversations with Janet Tyburec (BCI) it was revealed that during the BCI Bat Workshops on the east side of the Chiricahua Mountains that they captured fewer pipistrelles this year than normal. We have captured more big brown bats (*Eptesicus fuscus*) and Western small-footed myotis (*Myotis ciliolabrum*) than for any other species over the past 10 years (Table 12, Figure 3a & 3b). The big brown bat is one of the most numerous species of bats in the United States and in Arizona, this species is found throughout mid-to-higher-elevation forests and at some lower elevations throughout the summer (Monday 1993). The Western small-footed myotis is common throughout Arizona with the exception of the southwestern corner (Monday 1993.)

The scarcity of water in the Chiricahua Mountains during the drier months could be a limiting factor for bats in this area. Bats are mobile (flight) and have the advantage of being able to move to other areas in a short time if a resource such as water is unavailable to them. Bats are the only mammals that have sustained flight (Nowak 1994). Unfortunately, bats that are forced to move to more favorable areas in search of water may have negative effects on resident populations of bats. Bird populations “erupt” (departure of birds from their normal range) when food sources change or are unavailable for the birds (Weidensaul 1999). This results in increased competition for food sources for the resident populations of birds. The same may be true for bat populations that are forced to share a shrinking water source or move to other areas in search of additional water.

Year 2009 was an excellent year for bat captures and species and the high numbers of bats captured can probably be attributed to the dry conditions (Table 11 & Figure 5). A long-term inventory and monitoring projects allow us to examine temporal and spatial population shifts in relation to environmental and climatic change. Finding rare or new species, such as the red bat, Allens’ lappet-browed, occult little brown bat, or detecting population response to drought and flooding would not be possible in a short-term study. Shifting trends in seasonal migration patterns are also more likely captured in long-term studies like the large numbers of male silver-haired bats found in 2003, 2004, and 2009 during this study. Capturing numerous pregnant Townsend’s big-eared bats in 2004 and 2005 at the ChrNM emphasizes the importance of protecting maternity roosts. We capture fewer California myotis on the west side of the Chiricahua Mountains (ChrNM) than researchers on the east side of the mountain (BCI workshop records) probably indicating some differences for this species in this mountain range. We also captured more pipistrelles on the west side of the mountains in 2009 than researchers on the east side. We have captured both nectar species (lesser long-nosed bat and Mexican long-tongued bat) at FBNHS within the past five years and the long-term inventory project makes it possible to capture new species. Our data provides a tool that resource managers and biologists can utilize to help fill in gaps of knowledge for natural history, migration, movements, and population dynamics for bat species in the Chiricahua and Dos Cabeza Mountains. We will continue our study at the ChrNM and FBNHS in 2010 and 2011.

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Photo 3: Phil Brown (left), Ryan, Nathan, & Danielle Foster at the Creek study site in the ChrNM.



Photo 4: Austin Cockman processing a bat.



Photo 5: Mexican long-tongued bat (*Choeronycteris mexicana*) captured at FBNHS.



Photo 6: Partially healed broken finger on a male silver-haired bat (*Lasionycteris noctivagans*).

Photo 7: Western pipistrelle (*Pipistrellus hesperus*).



APPENDIX (BAT FIELD DATA TABLES & FIGURES FOR THE ChrNM and FBNHS 2009)

TABLE 1: Bat netting data from the small pool in the drainage parallel to road 228 m (249 yards) north of Bonita Canyon Campground in the ChrNM on May 4, 2009. Three 2.6 m (8') nets were opened at 1900 hours and closed at 2300 hours. Site coordinates are: (Net #1 s.) N Lat 32° 00.810, W Long 109° 21.267, 1607 m (5271') elev.; (Net #2 n.) N Lat 32° 00.837, W Long 109° 21.257, 1608 m (5274'); (Net #3 n.) N Lat 32° 00.858, W Long 109° 21.264, 1612 m (5287') elev.; clear; temp., wind, humidity from 1825 to 2125 hours: (77.3° F to 62.2° F), (0 to 0.9 mph), (18% to 23%); N = North, Lat = Latitude, W = West, Long = Longitude, temp. = temperature, elev. = elevation, FA = Forearm, TH = Thumb, (g) = grams, P = pregnant, M = male, F = female, s. = south, n. = north, WT. = weight, mm = millimeters, SP = Species., > = greater than, L = left, R = right, LAC = lactating, POST = post lactating, b/t = between, Abbrev = abbreviations.

Whiskered screech owls heard throughout the evening. No bats were captured. Stream is completely dry.

TABLE 2: Bat netting data from the "Old Pump" 1.5 miles north of Bonita Canyon Campground in the ChrNM on May 5, 2009. Three 2.6 m (8') nets were opened at 1900 hours and closed at 2400 hours. Site coordinates are: (Net #1 at pump) N Lat 32° 01.311, W Long 109° 20.344, 1741 m (5711') elev.; (Net #2 b/t #1 & 3) N Lat 32° 01.296, W Long 109° 20.349, 1739 m (5704') elev.; (Net #3) N Lat 32° 01.296, W Long 109° 20.359, 1738m (5701') elev.; clear, temp, wind, humidity from 1903 to 2302 hours: (73.3 ° F to 61.3° F), (0.0 to 0.6 mph), (15 % to 28 %); See word abbreviations in Table 1.

Table 2 – Old Pump					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1914	<i>Myotis ciliolabrum</i>	M	3	TH>4	Tail Projection
1928	<i>Myotis ciliolabrum</i>	M	3.5	TH>4	Left wing holes; Tail
1936	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=32
1936	<i>Myotis thysanodes</i>	F	9	FA=44	P; fringe
1946	<i>Myotis ciliolabrum</i>	M	3.5	TH>4	Tail; FA=33
1940	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=32
1949	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=34
1949	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=32
1955	<i>Pipistrellus hesperus</i>	M	3	FA=30	
2012	<i>Myotis thysanodes</i>	F	7	FA=43	P?; fringe
2012	<i>Myotis auriculus</i>	F	6	FA=37	P; brown ears;
2019	<i>Antrozous pallidus</i>	M	17	FA=54	
2019	<i>Eptesicus fuscus</i>	M	11	FA=44	Small

Table 2 continued – Old Pump					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
2019	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA= 34
2037	<i>Myotis volans</i>	M	5	FA=38	Fur to elbow
2047	<i>Antrozous pallidus</i>	M	14	FA=53	Tear L& R wing
2047	<i>Myotis volans</i>	M	7	FA=39	Fur to elbow
2047	<i>Myotis auriculus</i>	F	6	FA=38	P; brown ears
2047	<i>Myotis velifer</i>	M	7	FA=42	Bald spot
2101	<i>Antrozous pallidus</i>	M	17	FA=54	
2104	<i>Myotis ciliolabrum</i>	M	3.5	TH>4	FA= 33
2104	<i>Lasionycteris noctivagans</i>	M	9	FA=43	
2116	<i>Myotis ciliolabrum</i>	M	4	TH>4	FA=32
2117	<i>Antrozous pallidus</i>	M	16	FA=54	
2117	<i>Lasiurus cinereus</i>	M	22	FA=56	
2142	<i>Myotis thysanodes</i>	M	6	FA=43	Fringe
2142	<i>Myotis volans</i>	M	5	FA=39	Fur to elbow
2204	<i>Myotis californicus</i>	M	4	TH<4	No tail; FA=30
2204	<i>Myotis auriculus</i>	F	7	FA=38	Brown ears
2224	<i>Lasionycteris noctivagans</i>	M	10	FA=40	
2233	<i>Eptesicus fuscus</i>	M	18	FA=46	
2230	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=33
2229	<i>Eptesicus fuscus</i>	M	15	FA=45	
2251	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA= 33
2306	<i>Lasionycteris noctivagans</i>	M	9.5	FA=42	
2308	<i>Myotis ciliolabrum</i>	M	4	TH>4	FA=33; tail
2328	<i>Lasionycteris noctivagans</i>	M	10	FA=43	
2346	<i>Myotis auriculus</i>	F	7	FA=37	Brown ears
2351	<i>Eptesicus fuscus</i>	M	17	FA=47	
2359	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail
2414	<i>Lasionycteris noctivagans</i>	M	8	FA=43	
2425	<i>Eptesicus fuscus</i>	M	14	FA=49	
2420	<i>Myotis auriculus</i>	F	6	FA=38	Brown ears
TOTAL	43 Bats	37 M			
	11 SP	6 F			

TABLE 3: Bat netting data from Silver Spur Creek in the ChrNM on May 6, 2009. Three 2.6 m (8') nets opened at 1900 hours and closed at 2400 hours. Site coordinates are: (Net #1) N Lat 32° 00.529, W Long 109° 21.616, 1609m (5278') elev.; (Net #2) N Lat 32° 00.534, W Long 109° 21.625, 1609 m (5278') elev.; (Net #3) N Lat 32° 00.544, W Long 109° 21.638, 1608 m (5274'); clear; temp., wind, humidity from 1856 to 2348 hours: (76.8° F to 56.6° F), (0.5 to 0.0 mph), (18% to 32%); Bright moonlight; See word abbreviations in Table #1.

Table 3 – Silver Spur Creek					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1950	<i>Myotis auriculus</i>	F	6	FA=37	P; brown ears
1950	<i>Myotis auriculus</i>	F	6	FA=38	P; brown ears
1950	<i>Lasionycteris noctivagans</i>	M	9	FA=43	
1950	<i>Myotis auriculus</i>	M	6	FA=38	Brown ears
1950	<i>Myotis auriculus</i>	M	6	FA=38	Brown ears
1950	<i>Myotis ciliolabrum</i>	M	3	TH>4	Tail
1950	<i>Myotis ciliolabrum</i>	M	8	TH>4	Tail
1950	<i>Myotis auriculus</i>	F	7	FA=37	P; brown ears
1950	<i>Myotis thysanodes</i>	F	7	FA=43	P; fringe
1950	<i>Myotis ciliolabrum</i>	M	3.5	TH>4	Tail
1950	<i>Myotis auriculus</i>	F	7	FA=38	P; Mites, tick brown ears
2020	<i>Myotis ciliolabrum</i>	M	3	TH>4	Tail
2020	<i>Myotis thysanodes</i>	F	6.5	FA=41	P; fringe
2020	<i>Myotis thysanodes</i>	M	6	FA=43	Fringe
2020	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail
2030	<i>Pipistrellus hesperus</i>	M	3.5	FA=29	Black mask; round tragus
2030	<i>Myotis ciliolabrum</i>	F	4	TH>4	P; FA=32; tail
2030	<i>Antrozous pallidus</i>	M	15	FA=54	Hole in tail x 2
2045	<i>Myotis ciliolabrum</i>	M	4	TH>4	FA=33; tail
2046	<i>Myotis volans</i>	M	4.5	FA=39	Fur to elbow
2111	<i>Corynorhinus townsendii</i>	M	8	FA=47	
2112	<i>Myotis thysanodes</i>	F	7	FA=43	P; fringe
2014	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=34
2014	<i>Myotis thysanodes</i>	M	6.5	FA=42	Fringe
2014	<i>Eptesicus fuscus</i>	M	15	FA=47	
2014	<i>Myotis auriculus</i>	M	7	FA=38	Brown ears
2014	<i>Myotis auriculus</i>	F	6.5	FA=36	P; brown ears
2134	<i>Myotis ciliolabrum</i>	M	3	TH>4	Wet; FA=35; tail
2134	<i>Eptesicus fuscus</i>	F	23	FA=46	P
2159	<i>Lasionycteris noctivagans</i>	F	10	FA=39	P

Table 3 continued – Silver Spur Creek					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
2204	<i>Myotis auriculus</i>	F	7	FA=37	P; brown ears
2204	<i>Myotis auriculus</i>	F	7	FA=38	P; Ticks on L hand; brown ears
2223	<i>Myotis volans</i>	M	7	FA=39	Fur to elbow
2223	<i>Myotis auriculus</i>	M	6	FA=36	Brown ears
2225	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=33
2304	<i>Lasionycteris noctivagans</i>	M	10	FA=40	
2350	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=34
2420	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail; FA=32
TOTAL	38 Bats	25 M			
	9 SP	13 F			

TABLE 4: Bat netting data from the “Big Rock and Small Stream” near the offices in the ChrNM on May 7, 2009. Three 2.6 m (8”) nets were opened at 1900 hours and closed at 2400 hours. Site coordinates are: (Net #1 at Rock) N Lat 32°00.521, W Long 109° 21.946, 1597 m (5238’); (Net #2 in stream) N Lat 32° 00.540, W Long 109° 21.965, 1596m (5235’); (Net #3 in stream) N Lat 32° 00.521, W Long 109° 21.967, 1595 m (5232’); clear, temp, wind, humidity from 1853 to 2337 hours: (82° F to 54.7° F), (0.8 to 0.0 mph), (13% to 29%); Whiskered Screech-owl called at 2040 hours; See word abbreviations in Table #1.

Table 4 – Big Rock & Small Stream					
TIME	SPECIES	SEX	WT.	FA/T	NOTES
1917	<i>Pipistellus hesperus</i>	M	3	FA=27	Black mask; tragus round
1930	<i>Myotis velifer</i>	F	7	FA=42	P?; bare patch
1930	<i>Pipistellus hesperus</i>	F	3	FA=28	P; black mask
1930	<i>Myotis velifer</i>	M	8	FA=44	Bare patch
1930	<i>Myotis velifer</i>	F	9	FA=44	P; bare patch
1930	<i>Myotis velifer</i>	F	9	FA=43	P; bare patch
1942	<i>Lasionycteris noctivagans</i>	M	8.5	FA=40	
1942	<i>Lasionycteris noctivagans</i>	M	9.5	FA=41	
1942	<i>Lasionycteris noctivagans</i>	F	8.5	FA=40	P
1955	<i>Myotis velifer</i>	F	10	FA=45	P; bare patch
1955	<i>Myotis velifer</i>	F	10	FA=44	P; bare patch
1955	<i>Lasionycteris noctivagans</i>	M	10	FA=42	
1955	<i>Lasionycteris noctivagans</i>	M	10	FA=42	
1955	<i>Lasionycteris noctivagans</i>	M	9	FA=44	
1955	<i>Eptesicus fuscus</i>	M	18	FA=45	
1955	<i>Lasionycteris noctivagans</i>	M	9	FA=45	

Table 4 continued – Big Rock and Small Stream					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1955	<i>Myotis velifer</i>	F	10	FA=43	P; bare patch
1955	<i>Lasionycteris noctivagans</i>	M	9.5	FA=39	
1955	<i>Eptesicus fuscus</i>	F	14	FA=45	P
1955	<i>Myotis thysanodes</i>	F	8	FA=42	P; fringe
2015	<i>Antrozous pallidus</i>	M	17	FA=52	
2020	<i>Lasionycteris noctivagans</i>	M	8.5	FA=38	
2020	<i>Myotis thysanodes</i>	F	9	FA=43	P; fringe
2020	<i>Myotis californicus</i>	M	4	TH<4	No tail; FA=29
2020	<i>Lasionycteris noctivagans</i>	F	10	FA=42	P
2020	<i>Pipistrellus hesperus</i>	M	3	FA=28	Mask; round tragus
2020	<i>Lasionycteris noctivagans</i>	M	9.5	FA=40	
2020	<i>Lasionycteris noctivagans</i>	M	9	FA=39	
2020	<i>Eptesicus fuscus</i>	F	16	FA=47	P
2020	<i>Myotis ciliolabrum</i>	M	3	TH>4	Tail
2020	<i>Lasionycteris noctivagans</i>	F	10	FA=39	P
2035	<i>Myotis ciliolabrum</i>	M	4	TH>4	Tail
2035	<i>Eptesicus fuscus</i>	F	18	FA=47	P
2035	<i>Lasionycteris noctivagans</i>	M	9	FA=40	
2035	<i>Eptesicus fuscus</i>	M	14	FA=43	
2035	<i>Eptesicus fuscus</i>	M	14	FA=45	
2050	<i>Eptesicus fuscus</i>	M	18	FA=47	
2050	<i>Lasionycteris noctivagans</i>	M	9	FA=42	
2050	<i>Lasionycteris noctivagans</i>	M	9	FA=43	Scrape on chest missing hair
2050	<i>Eptesicus fuscus</i>	F	15	FA=46	P
2050	<i>Lasionycteris noctivagans</i>	M	9.5	FA=42	
2100	<i>Myotis thysanodes</i>	F	7	FA=44	P; fringe
2100	<i>Myotis ciliolabrum</i>	F	4	TH>4	P; tail
2100	<i>Eptesicus fuscus</i>	M	14	FA=46	
2100	<i>Myotis ciliolabrum</i>	M	4.5	TH>4	Tail
2120	<i>Myotis thysanodes</i>	F	7	FA=43	P; fringe
2120	<i>Eptesicus fuscus</i>	M	11.5	FA=43	
2120	<i>Eptesicus fuscus</i>	M	17	FA=46	
2120	<i>Lasionycteris noctivagans</i>	F	8.5	FA=39	P; Small hole in R wing b/t elbow & finger 5
2120	<i>Eptesicus fuscus</i>	M	16	FA=46	
2120	<i>Lasionycteris noctivagans</i>	M	8	FA=41	

Table 4 continued – Big Rock and Small Stream					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
2140	<i>Lasionycteris noctivagans</i>	M	9	FA=39	
2140	<i>Eptesicus fuscus</i>	M	15	FA=44	
2140	<i>Myotis ciliolabrum</i>	F	4	FA=32	P; tail
2140	<i>Eptesicus fuscus</i>	F	14	FA=43	P
2140	<i>Eptesicus fuscus</i>	F	14	FA=43	P
2151	<i>Eptesicus fuscus</i>	M	15	FA=44	
2152	<i>Lasionycteris noctivagans</i>	M	9.5	FA=40	
2152	<i>Myotis velifer</i>	M	9	FA=43	Bare patch
2152	<i>Lasionycteris noctivagans</i>	M	7	FA=40	Hole in L wing
2210	<i>Myotis auriculus</i>	M	7	FA=37	Brown ears
2210	<i>Eptesicus fuscus</i>	M	16	FA=44	
2214	<i>Myotis ciliolabrum</i>	M	4	FA=33	Tail
2214	<i>Myotis thysanodes</i>	F	7	FA=43	P; fringe
2214	<i>Eptesicus fuscus</i>	M	15	FA=42	
2238	<i>Lasionycteris noctivagans</i>	M	9	FA=39	
2238	<i>Lasionycteris noctivagans</i>	M	9	FA=40	Healed broken finger
2238	<i>Eptesicus fuscus</i>	F	18	FA=44	P
2238	<i>Lasiurus cinereus</i>	F	31	FA=55	P; large female
2300	<i>Lasionycteris noctivagans</i>	M	9	FA=39	
2300	<i>Lasionycteris noctivagans</i>	M	9	FA=41	
2300	<i>Lasionycteris noctivagans</i>	M	9	FA=41	
2305	<i>Lasionycteris noctivagans</i>	M	10	FA=40	
2307	<i>Eptesicus fuscus</i>	F	17	FA=43	P
2330	<i>Myotis ciliolabrum</i>	M	4	FA=32	Tail
2330	<i>Lasionycteris noctivagans</i>	M	9	FA=40	
2330	<i>Myotis ciliolabrum</i>	M	4	FA=31	Tail
2330	<i>Lasionycteris noctivagans</i>	M	9	FA=41	
2330	<i>Eptesicus fuscus</i>	M	16	FA=42	
2330	<i>Eptesicus fuscus</i>	M	17	FA=44	
2353	<i>Lasionycteris noctivagans</i>	M	8	FA=42	
2353	<i>Myotis ciliolabrum</i>	M	5	FA=33	Tail
2353	<i>Myotis ciliolabrum</i>	F	4.5	FA=34	P; tail
2353	<i>Lasionycteris noctivagans</i>	M	9	FA=41	
2353	<i>Eptesicus fuscus</i>	M	17	FA=43	
2400	<i>Myotis velifer</i>	M	7	FA=42	Bare patch
2415	<i>Lasionycteris noctivagans</i>	M	8	FA=43	
TOTAL	87 Bats	59 M			
	10 SP	28 F			

TABLE 5: Bat netting data from Apache Springs (AS) at the FBNHS on June 22, 2009. Two 2.6 m (8') nets were opened at 1940 hours and closed at 2400 hours. Site coordinates are: (Net #1 at Spring n.) N Lat 32° 08.737, W Long 109° 26.441, 1496 m (4907') elev.; (Net #2, s. of Net #1) N Lat 32° 08.738, W Long 109° 26.449, 1495 m (4904') elev.; started cloudy then turned clear by 2106 hours, temp, wind, humidity from 1901 to 2300 hours: (83.8 ° F to 79° F), (0.0 to 0.9 mph), (27% to 37%); Stream very dry with a few puddles of water. See word abbreviations in Table #1.

Table 5- Apache Springs					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1950	<i>Myotis californicus</i>	F	3	FA=29	LAC; no tail
2008	<i>Myotis velifer</i>	M	7	FA=43	Bare patch
2216	<i>Myotis velifer</i>	F	8	FA=44	LAC; bare patch
2216	<i>Myotis velifer</i>	F	9	FA=44	LAC; bare patch
2243	<i>Myotis velifer</i>	F	9	FA=40	LAC; bare patch
2243	<i>Myotis velifer</i>	F	10.5	FA=43	LAC; bare patch
2245	<i>Myotis velifer</i>	M	6	FA=43	Bare patch
2310	<i>Myotis velifer</i>	F	11	FA=44	LAC; bare patch
2310	<i>Myotis velifer</i>	F	8	FA=43	LAC; bare patch
2310	<i>Myotis velifer</i>	F	9	FA=41	LAC; bare patch
2310	<i>Myotis velifer</i>	F	9.5	FA=44	LAC ; bare patch
2335	<i>Myotis velifer</i>	F	8	FA=43	LAC; bare patch
2335	<i>Myotis velifer</i>	F	11	FA=44	LAC; bare patch
2335	<i>Myotis velifer</i>	F	10	FA=43	LAC; bare patch
2335	<i>Myotis velifer</i>	M	9	FA=43	Bare patch
2335	<i>Myotis ciliolabrum</i>	M	3	FA=32	Tail
2339	<i>Myotis velifer</i>	F	11	FA=43	LAC; bare patch
TOTAL	17 Bats	4 M			
	3 SP	13 F			

TABLE 6: Bat netting data from the small pool in the drainage parallel to road 250 yards north of Bonita Canyon Campground in the ChrNM on August 10, 2009. Two 2.6 m (8') nets were opened at 1900 hours and closed at 2200 hours. Site coordinates are: (Net #1) N Lat 32° 00.835, W Long 109° 21.266, 1618m (5307') elev; (Net #2) N Lat 32° 00.864, W Long 109° 21.260, 1618 m (5307') elev.; overcast; temp., wind, humidity from 1909 to 2118 hours: (79.1.4° F to 74.6° F), (0.0 mph), (44% to 51%); Bats flying around. At 1930 hours Western Screech-Owl call. See word abbreviations in Table 1.

No bats were captured during evening. Stream is completely dry.

TABLE 7: Bat netting data from the “Old Pump” 1.5 miles north of Bonita Canyon Campground in the ChrNM on August 11, 2009. Three 2.6 m (8’) nets opened at 1900 hours and closed at 2400 hours. Site coordinates are: (Net #1 at pump) N Lat 32° 01.293, W Long 109° 20.308, 1680 m (5510’) elev.; (Net #2, s. of #1) N Lat 32° 01.297, W Long 109° 20.332, 1679 m (5507’) elev.; (Net #3, s. of #2.) N Lat 32° 01.294, W Long 109° 20.351, 1678 m (5504’) elev.; Humid and overcast then became clear at 2028 hours, waning moon, temp, wind, humidity from 1900 to 2300 hours: (75.2° F to 70.8° F), (0.3 to 0.0 mph), (58% to 54%); water level down; See word abbreviations in Table 1.

Table 7 – Old Pump					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1917	<i>Pipistrellus hesperus</i>	M	3	FA=28	Black mask; tragus round
1925	<i>Myotis californicus</i>	M	3	FA=30	No tail
1920	<i>Pipistrellus hesperus</i>	M	3	FA=28	Black mask; tragus round
1935	<i>Myotis californicus</i>	F	4	FA=31	POST; no tail
1940	<i>Pipistrellus hesperus</i>	M	3	FA=28	Black mask; tragus round
1940	<i>Myotis thysanodes</i>	F	6	FA=43	POST; fringe
1940	<i>Myotis thysanodes</i>	F	6	FA=42	POST; fringe
1945	<i>Myotis thysanodes</i>	F	5	FA=45	POST; fringe
1945	<i>Myotis thysanodes</i>	M	5	FA=46	Fringe
1950	<i>Myotis velifer</i>	F	5.5		POST
1950	<i>Myotis thysanodes</i>	M	5	FA=43	Fringe
1955	<i>Myotis thysanodes</i>	F	5	FA=44	POST; fringe
1955	<i>Myotis thysanodes</i>	M	6	FA=44	Fringe
1955	<i>Pipistrellus hesperus</i>	M	3	FA=30	Black mask; tragus round
1955	<i>Pipistrellus hesperus</i>	M	3	FA=29	Black mask; tragus round
1955	<i>Myotis thysanodes</i>	F	6	FA=43	POST; fringe
1955	<i>Pipistrellus hesperus</i>	M	3	FA=29	Black mask; tragus round
1955	<i>Myotis thysanodes</i>	M	6		Fringe
2007	<i>Myotis velifer</i>	F	5	FA=44	POST; bare patch
2007	<i>Myotis thysanodes</i>	M	6	FA=44	Fringe
2010	<i>Myotis velifer</i>	F	4	FA=42	POST; bare patch
2010	<i>Myotis ciliolabrum</i>	M	4	FA=33	Tail
2010	<i>Myotis auriculus</i>	F	5	FA=39	POST; brown ears
2015	<i>Myotis californicus</i>	M	3	FA=30	No tail
2015	<i>Corynorhinus townsendii</i>	F	8	FA=42	
2030	<i>Antrozous pallidus</i>	M	17	FA=52	
2030	<i>Pipistrellus hesperus</i>	M	3	FA=28	Black mask; tragus round
2030	<i>Pipistrellus hesperus</i>	M	3	FA=30	Black mask; tragus round
2046	<i>Pipistrellus hesperus</i>	M	3	FA=31	Black mask; tragus round

Table 7 continued – Old Pump					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
2046	<i>Myotis velifer</i>	M	5	FA=43	Bare patch
2046	<i>Myotis velifer</i>	F	5	FA=42	POST; bare patch
2046	<i>Myotis velifer</i>	F	6	FA=41	POST; bare patch
2053	<i>Myotis thysanodes</i>	F	6	FA=44	POST; fringe
2100	<i>Myotis velifer</i>	F	5	FA=42	No nipples; bare patch
2103	<i>Eptesicus fuscus</i>	M	11	FA=44	
2103	<i>Pipistrellus hesperus</i>	M	2.5	FA=28	Black mask; round tragus
2103	<i>Lasiurus cinereus</i>	M	23	FA=53	
2115	<i>Eptesicus fuscus</i>	M	15	FA=45	
2121	<i>Myotis auriculus</i>	F	5	FA=39	POST
2150	<i>Eptesicus fuscus</i>	F	29	FA=51	POST; big bat
2152	<i>Eptesicus fuscus</i>	M	13	FA=43	
2210	<i>Eptesicus fuscus</i>	M	13	FA=45	Pollen
2210	<i>Antrozous pallidus</i>	M	15	FA=52	Ticks
2240	<i>Antrozous pallidus</i>	M	22	FA=54	Yellow pollen on wings
2306	<i>Eptesicus fuscus</i>	M	11	FA=42	Pollen
2306	<i>Myotis velifer</i>	F	5	FA=43	POST; bare patch
2330	<i>Antrozous pallidus</i>	M	18	FA=52	
2330	<i>Myotis thysanodes</i>	F	5	FA=43	POST; fringe
2330	<i>Eptesicus fuscus</i>	M	14	FA=46	
2350	<i>Eptesicus fuscus</i>	M	16	FA=46	Yellow pollen on wings
2350	<i>Eptesicus fuscus</i>	M	17	FA=45	
2412	<i>Eptesicus fuscus</i>	M	17	FA=45	
TOTAL	52 Bats	33 M			
	10 SP	19 F			

TABLE 8: Bat netting data from the “Big Rock and Small Stream” near the offices in the ChrNM on August 13, 2009. Two 2.6 m (8’) nets were opened at 1900 hours and closed at 2400 hours. Site coordinates are: (Net #1) N Lat 32° 00.523, W Long 109° 21.966, 1596 m (5235’) elev.; (Net #2) N Lat 32° 00.503, W Long 109° 21.902, 1597 m (5238’) elev.; mostly cloudy with lightning throughout evening; Temp., wind, humidity from 1925 to 2329 hours: (66.8° F to 62.4° F), (0.0 to 0.5 mph), (66.4% to 100%); Western Screech-owl at 2146 hours; See word abbreviations in Table 1.

Table 8 – Big Rock and Small Stream					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
2006	<i>Corynorhinus townsendii</i>	F	7	FA=43	POST
2025	<i>Eptesicus fuscus</i>	M	17	FA=45	

Table 8 continued – Big Rock and Small Stream					
2103	<i>Eptesicus fuscus</i>	M	20	FA=44	
2219	<i>Myotis velifer</i>	M	6	FA=40	
2243	<i>Eptesicus fuscus</i>	M	17	FA=47	
TOTAL	5 Bats	4 M			
	3 SP	1 F			

TABLE 9: Bat netting data from Silver Spur Creek in the ChrNM on August 14, 2009. Three 2.6 m (8') nets opened at 1900 hours and closed at 2400 hours. Net #1 was closed between 2000 and 2100 hours. Site coordinates are: (Net #1) N Lat 32° 00.530, W Long 109° 21.616, 1622 m (5322') elev.; (Net #2) N Lat 32° 00.534, W Long 109° 21.624, 1620 m (5313') elev.; (Net #3) N Lat 32° 00.553, W Long 109° 21.639, 1617 m (5304') elev.; clear; Temp., wind, humidity from 1855 to 2303 hours: (75.5° F to 63.3° F), (0.0 mph), (57% to 90%); Whiskered screech-owl call at 2100 hours; See word abbreviations in Table #1.

Table 9 – Silver Spur Creek					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1935	<i>Myotis ciliolabrum</i>	F	3	FA=33	POST; tail
1935	<i>Myotis ciliolabrum</i>	F	3	FA=34	POST; tail
1935	<i>Myotis ciliolabrum</i>	F	3		POST; tail
1942	<i>Myotis auriculus</i>	M	5	FA=39	Brown ears
1942	<i>Myotis californicus</i>	M	3	FA=30	No tail
1944	<i>Eptesicus fuscus</i>	F	14	FA=44	POST
1945	<i>Myotis californicus</i>	F	3	FA=29	POST; no tail
1957	<i>Eptesicus fuscus</i>	M	11	FA=46	
1959	<i>Myotis auriculus</i>	F	5	FA=39	POST; brown ears
2000	<i>Myotis thysanodes</i>	M	6	FA=44	Fringe
2001	<i>Myotis auriculus</i>	F	7	FA=38	POST
2002	<i>Myotis thysanodes</i>	F	6	FA=42	POST; fringe
2002	<i>Myotis thysanodes</i>	F	6	FA=44	No nipples; fringe
2002	<i>Myotis ciliolabrum</i>	F	4	FA=34	Tail
2003	<i>Myotis thysanodes</i>	F	5	FA=45	POST; fringe
2004	<i>Myotis thysanodes</i>	M	6	FA=44	Fringe
2005	<i>Myotis thysanodes</i>	F	6	FA=44	POST
2005	<i>Myotis volans</i>	M	5	FA=39	POST; fur to elbow
2006	<i>Corynorhinus townsendii</i>	F	6.5	FA=44	No nipples
2007	<i>Myotis auriculus</i>	F	5	FA=39	POST; Yellow on breast
2009	<i>Myotis thysanodes</i>	M	6.5	FA=43	Fringe

Table 9 continued – Silver Spur Creek					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
2016	<i>Myotis volans</i>	M	3	FA=38	Small; hair to elbow
2017	<i>Myotis thysanodes</i>	M	7	FA=42	Fringe
2018	<i>Myotis thysanodes</i>	M	5	FA=44	Fringe
2019	<i>Myotis thysanodes</i>	M	6	FA=43	Fringe
2020	<i>Myotis thysanodes</i>	F	7	FA=44	POST; fringe
2021	<i>Myotis thysanodes</i>	F	7	FA=42	POST; fringe
2021	<i>Myotis auriculus</i>	F	6	FA=37	POST; brown ears
2022	<i>Myotis californicus</i>	F	3	FA=29	Young of year?
2024	<i>Myotis thysanodes</i>	M	6		Fringe
2027	<i>Myotis thysanodes</i>	F	8	FA=42	Nipples obvious. LAC?
2028	<i>Myotis thysanodes</i>	M	5	FA=42	Fringe
2040	<i>Myotis thysanodes</i>	F	6	FA=44	POST; fringe
2041	<i>Eptesicus fuscus</i>	M	19	FA=49	
2042	<i>Antrozous pallidus</i>	M	16	FA=52	
2055	<i>Eptesicus fuscus</i>	F	17	FA=48	POST
2107	<i>Eptesicus fuscus</i>	M	16	FA=48	
2107	<i>Myotis thysanodes</i>	F	5	FA=43	POST; fringe
2108	<i>Myotis thysanodes</i>	F	7	FA=43	No nipples; fringe
2122	<i>Myotis auriculus</i>	F	5	FA=37	POST; Ears=18mm
2126	<i>Myotis auriculus</i>	F	5	FA=37	Ears=18mm;no nipples
2148	<i>Myotis thysanodes</i>	F	6.5		No nipples; fringe
2150	<i>Myotis thysanodes</i>	M	6.5	FA=45	Fringe
2211	<i>Myotis ciliolabrum</i>	M	3	FA=33	Mask; tail
2217	<i>Myotis auriculus</i>	M	4.5	FA=38	Brown ears
2217	<i>Antrozous pallidus</i>	M	19	FA=53	
2245	<i>Myotis auriculus</i>	M	5	FA=38	Brown ears
2249	<i>Antrozous pallidus</i>	M	17	FA=54	
2250	<i>Eptesicus fuscus</i>	F	19	FA=50	POST
2318	<i>Eptesicus fuscus</i>	F	14	FA=48	No nipples
2339	<i>Eptesicus fuscus</i>	M	13	FA=47	
2340	<i>Myotis auriculus</i>	M	5	FA=37	Brown ears
2413	<i>Eptesicus fuscus</i>	F	20	FA=51	POST
2413	<i>Myotis volans</i>	F	5	FA=39	No nipple; hair to elbow
2413	<i>Myotis auriculus</i>	F	9	FA=39	No nipples; brown ears
TOTAL	55 Bats/8 SP	24 M/31 F			

TABLE 10: Bat netting data from Apache Springs (AS) at the FBNHS on August 4, 2009. Two 2.6 m (8') nets were opened at 1900 hours and closed at 2300 hours. Site coordinates are: (Net #1 at Spring) N Lat 32° 08.736, W Long 109° 26.442, 1488 m (4882') elev.; (Net #2) N Lat 32° 08.737, W Long 109° 26.446, 1486 m (4875') elev. Stream volume of water is low and there is little standing water (less than in 2008). Waxing moon. Clear but thunderstorm could be heard in the distance. Temp., wind, humidity from 1910 to 2240 hours: (77.9° F to 70.9° F), (0 mph), (55% to 77%); See word abbreviations in Table 1.

Table 10 – Apache Springs					
TIME	SPECIES	SEX	WT. (g)	FA/TH	NOTES
1915	<i>Myotis velifer</i>	F	6	FA=43	No nipples; bare patch
1915	<i>Myotis velifer</i>	F	5.5	FA=44	No nipples; bare patch
1915	<i>Myotis velifer</i>	F	6	FA=44	No nipples; bare patch
1915	<i>Myotis velifer</i>	F	6	FA=43	No nipples; bare patch
1915	<i>Myotis velifer</i>	F	6	FA=44	No nipples; bare patch
1915	<i>Myotis velifer</i>	F	6	FA=44	POST; bare patch
1915	<i>Myotis velifer</i>	F	6	FA=43	No nipples; bare patch
1915	<i>Myotis velifer</i>	F	5.5	FA=43	No nipples; bare patch
1915	<i>Myotis velifer</i>	M	7	FA=44	Wound healed on R uropatagium
1930	<i>Myotis velifer</i>	F	7	FA=43	No nipples; bare patch
1930	<i>Myotis velifer</i>	F	6	FA=44	No nipples; bare patch
1930	<i>Myotis velifer</i>	F	6	FA=43	No nipples; bare patch
1930	<i>Myotis velifer</i>	F	6	FA=44	No nipples; Ticks, bare patch
2012	<i>Choeronycteris mexicana</i>	F	15	FA=46	POST
2030	<i>Myotis californicus</i>	F	3	FA=29	No nipples or tail
2050	<i>Myotis ciliolabrum</i>	M	3	FA=33	Tail
2125	<i>Myotis velifer</i>	F	7	FA=43	No nipples; bare patch
2150	<i>Myotis californicus</i>	F	6	FA=30	No tail
2300	<i>Choeronycteris mexicana</i>	M	23	FA=47	Maggot-like parasite on chin
TOTAL	19 Bats	3 M			
	4 SP	16 F			

TABLE 11: Rainfall data totals (in inches) for the ChrNM for April – August 2000 to 2009. cm = centimeters, “ = inches.

YEAR/ MONTH	APRIL inches	MAY inches	JUNE inches	JULY inches	AUGUST inches	TOTALS (April to August)
2000	0.00	0.00	4.70	2.52	4.59	11.81 “ (30.00 cm)
2001	1.01	0.39	0.36	4.87	5.56	12.19 “ (31.00 cm)
2002	0.08	0.00	0.00	2.97	7.32	10.37 “ (26.30 cm)
2003	0.00	0.00	0.22	1.31	1.36	2.89 “ (7.30 cm)
2004	1.21	0.14	1.18	3.39	3.61	9.53 “ (24.20 cm)
2005	0.51	0.49	0.09	0.36	3.47	4.92 “ (12.50 cm)
2006	0.01	0.00	0.31	9.11	5.15	14.58 “ (37.00 cm)
2007	0.57	0.55	1.11	3.66	5.02	10.91 “ (27.71 cm)
2008	3.01	3.35	2.76	3.14	3.25	15.51 “ (39.40 cm)
2009	0.46	2.43	1.72	2.85	2.17	9.63 ” (24.46 cm)

TABLE 12: ChrNM Bat Summary Data for Years 2000 – 2009. ID = Identification, SP = Species, My = Myotis, YR = Year. See Table 14 for species names.

BAT SP/ YR	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Apal	5	0	5	8	4	6	8	1	4	12
Cmex	0	1	1	1	1	2	0	0	0	0
Ctow	5	3	2	6	17	15	5	8	8	4
Efus	18	14	19	46	41	40	23	66	37	52
Iphy	1	1	1	0	0	1	0	0	1	0
Lnoc	0	6	4	46	37	15	3	6	19	42
Lblo	0	0	0	3	0	0	0	1	0	0
Lcin	1	3	0	3	5	5	0	3	0	2
Lcur	2	0	0	1	0	1	0	0	0	0
Maur	18	5	13	46	16	17	30	12	30	30
Myca	6	12	14	46	21	17	6	14	14	8
Mcil	4	3	0	9	16	21	15	23	24	42
Mocc	0	0	0	0	0	0	1	1	0	0
Mthy	36	31	45	60	34	36	12	10	13	45
Mvel	1	5	5	8	3	1	0	2	9	19
Mvol	6	0	3	5	11	9	9	5	13	8
My SP	2	0	1	0	0	0	0	0	0	0
Phes	2	1	3	5	8	9	2	9	10	16
TOTALS	107 Bats 13 SP	85 Bats 12 SP	116 Bats 12 SP	293 Bats 15 SP	214 Bats 13 SP	195 Bats 15 SP	114 Bats 11 SP	161 Bats 14 SP	182 Bats 12 SP	280 Bats 12 SP

TABLE 13: FBNHS Bat Summary Data for Years 2001 – 2009. ID = Identification, SP = Species, YR = Year.

BAT SP/YR	2001	2002	2003	2004	2005	2006	2007	2008	2009
Ctow	0	0	0	0	1	1	0	0	0
Cmex	0	0	0	0	0	0	0	0	2
Lcur	0	0	0	0	1	0	1	0	0
Maur	1	0	0	0	0	1	0	0	0
Myca	4	3	3	3	0	4	5	1	3
Mcil	1	0	1	1	1	6	3	1	2
Mocc	1	0	0	0	0	0	0	0	0
Mthy	1	2	1	3	0	0	1	0	0
Mvel	2	0	0	1	0	2	33	23	29
Mvol	0	0	0	1	0	3	0	2	0
Myotis SP	2	0	0	0	0	0	0	0	0
TOTALS	12 Bats 6 SP	5 Bats 2 SP	5 Bats 3 SP	9 Bats 5 SP	3 Bats 3 SP	17 Bats 6 SP	43 Bats 5 SP	27 Bats 4 SP	36 Bats 4 SP

TABLE 14: Species Names, Netting Locations, and Total Number Bats Captured for Each Species (2000-2009).

SCIENTIFIC NAME	COMMON NAME	ABBREV	TOTAL # Bats (2000-2009)
<i>Antrozous pallidus</i>	Pallid bat	Apal	53
<i>Choeronycteris mexicana</i>	Mexican long-tongued bat	Cmex	8
<i>Corynorhinus townsendii</i>	Townsend's big-eared bat	Ctow	75
<i>Eptesicus fuscus</i>	Big brown bat	Efus	356
<i>Idionycteris phyllotis</i>	Allen's lappet-browed bat	Iphy	5
<i>Lasionycteris noctivagans</i>	Silver-haired bat	Lnoc	179
<i>Lasiurus blossevillii</i>	Western red bat	Lblo	4
<i>Lasiurus cinereus</i>	Hoary bat	Lcin	22
<i>Leptonycteris curasoae</i>	Lesser long-nosed bat	Lcur	6
<i>Myotis auriculus</i>	Southwestern myotis	Maur	219
<i>Myotis californicus</i>	California myotis	Myca	184
<i>Myotis ciliolabrum (leibii)</i>	Western small-footed myotis	Mcil	357
<i>Myotis occultus (lucifugus)</i>	Occult little brown bat	Mocc	3
<i>Myotis thysanodes</i>	Fringed myotis	Mthy	329
<i>Myotis velifer</i>	Cave myotis	Mvel	143
<i>Myotis volans</i>	Long-legged myotis	Mvol	218
<i>Pipistrellus hesperus</i>	Western pipistrelle	Phes	65
Small Pool	----	SP	----
Old Pump	----	OP	----
Silver Spur Creek	----	SSC	----
Rock & Stream	----	RS	----

TABLE 15: ChrNM Netting locations, year, & number of bats captured at each site. ** SSC Meadow & Quarry Trail Pond locations were only netted in 2001.

Location/Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Small Pool (SP)	22	20	2	9	7	13	2	9	1	0
Old Pump (OP)	14	13	18	54	59	76	45	70	50	95
Silver Spur Creek (SSC)	36	29	50	134	81	63	64	47	118	93
Rock & Stream (RS)	35	18	46	96	67	43	3	35	13	92
SSC Creek Meadow**	----	1	----	----	----	----	----	----	----	----
Quarry Trail Pond**	----	4	----	----	----	----	----	----	----	----
Totals	107 Bats	85 Bats	116 Bats	293 Bats	214 Bats	195 Bats	114 Bats	161 Bats	182 Bats	280 Bats

Figure 1 - ChrNM Totals for Bat Numbers & Species by Year

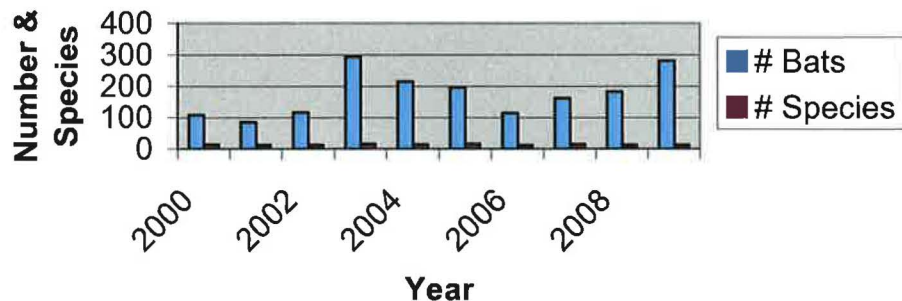


Figure 2 - FBNHS Totals for Bat Numbers & Species by Year

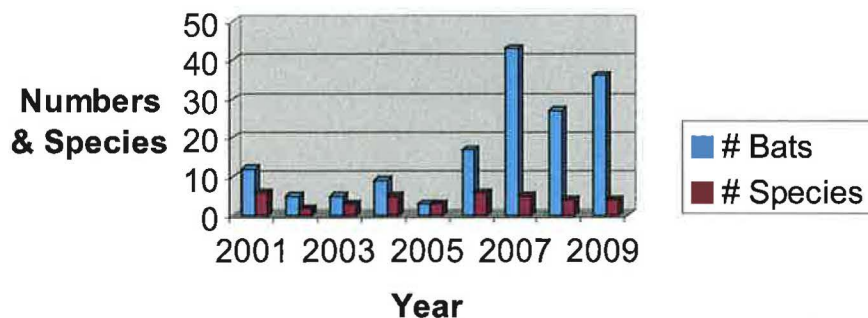


**Figure 3a - ChrNM Bat Species Totals
for 2000-2009 (See Definitions in Table
14)**

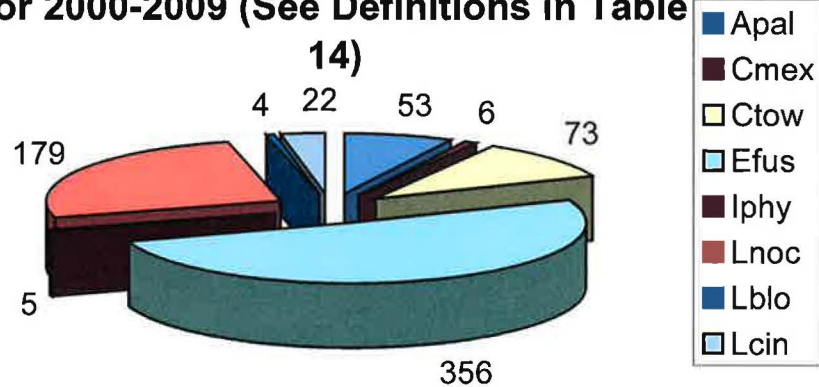


**Figure 3b - ChrNM Bat Species Totals
for 2000-2009 (See Definitions in
Table 14)**

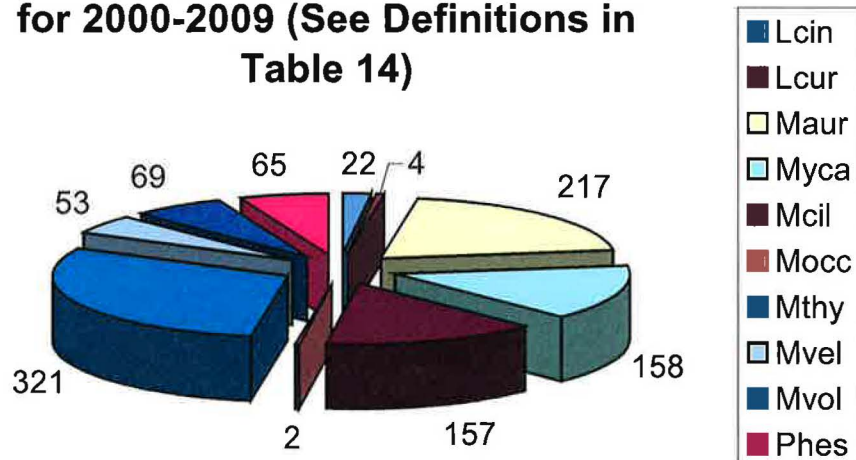


**Figure 4 - FBNHS Bat Species Totals
for 2001-2009 (See Definitions in
Table 14)**

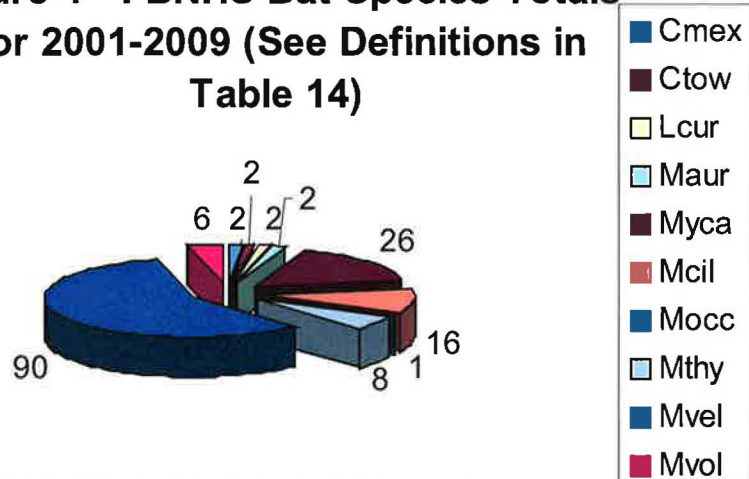


Figure 5 - ChrNM Totals for Bat Numbers & Rainfall (Apr-Aug) by Year

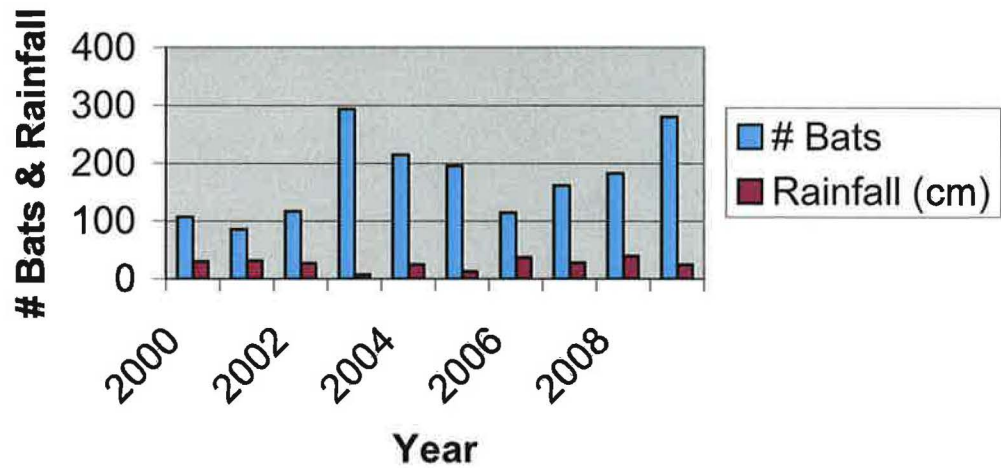
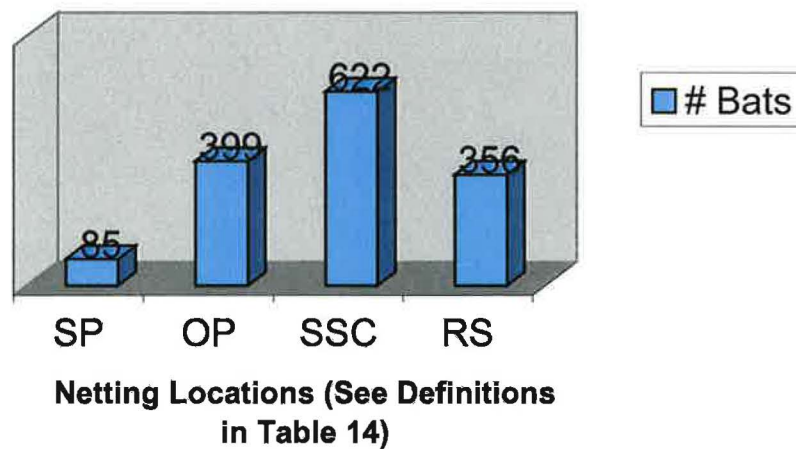


Figure 6 - ChrNM Netting Locations & # Bats Captured



Map of the ChrNM & FBNHS in Southern Arizona -

