



MOJAVE NETWORK

Inventory Summary Report

INVENTORY OF MAMMALS AT GREAT BASIN NATIONAL PARK

INTRODUCTION AND OBJECTIVES

In 2002, the Mojave Network identified the inventory of non-volant small mammals and small predators of Great Basin National Park (GRBA) a high priority and joined with the University of Utah to begin the project. This inventory, conducted in 2002 and 2003, supplemented initial surveys, conducted by Eric Rickart during the summer of 2000, with focused survey efforts in areas that had been poorly sampled or had not been sampled previously.

Objectives of this project included establishing a comprehensive list of expected mammal species within the Park, documenting the occurrence of 90% of small mammals, obtaining a voucher specimen for each species, identifying sensitive species that are federally or state-listed, rare, or worthy of special consideration, and establishing randomly located permanent sampling grid sites for future monitoring.

Project Synopsis

Partner: University of Utah

Principal Investigator: Eric Rickart

Documented: 48 Small Mammal Species

Project Duration: 2002 - 2005

Cost: \$20,396

METHODS

Historical records - Published literature, museum collection records, and a few unpublished records consisting of early visual sighting reports or physical specimens retained by the GRBA resource Management office were searched for documentation of mammals within GRBA. Paleofaunal records in the Park region were also searched to establish when and what local extinctions may have occurred. Additionally, records from the "Park region" were compiled to create a list of the species that potentially occur within the Park but have not been documented.

Field surveys - Several traps were used to collect mammals. Collapsible aluminum Sherman live traps targeted small species, especially rodents. Break-back snap traps, designed to quickly and humanely kill small mammals, were used in microhabitats such as steep rocky slopes where Sherman traps are less effective. Pitfall traps were constructed from 12 oz beverage cans and set individually without drift fences and Tomahawk Traps and McAbee Gopher Traps were used to capture larger mammals in a few locations. In 2002, grid trapping was done at 11 randomly generated sites within Snake Creek and Strawberry Creek canyons. Six of these grids were established as permanent sites for future monitoring of small mammal communities. Directed trapping methods were used in a range of local microhabitats to maximize the rate of species detection. Separate trap transects were set in lines of between 5 to 50 traps in areas of relatively

uniform habitat. Traps were set in runways, beside fallen logs, by burrow openings, or in other locations with signs of small mammal activity. Survey locations were recorded with photographs and extensive description data. Livetrapped individuals were marked and released and species, sex, and age were recorded. Recorded data for voucher specimens included species, age, sex, external length measurements, and body mass. Voucher specimens were preserved whole or prepared as complete skeletons and were deposited in the Utah Museum of Natural History mammal collection. For nearly all voucher specimens, samples of skeletal muscle tissue were preserved for genetic analyses.



Opportunistic data collection – Records of visual observations, specimens, scat, and tracks reported by park visitors and staff were collected. Also included were records of carnivores obtained by park staff through automated camera stations, records of directed surveys for marmot, and general results of small mammal grid trapping conducted independently by Park personnel in 2004.

RESULTS AND DISCUSSION

Between 48 and 51 species of non-volant mammals are estimated to currently occur within the Park. Of these, 46 (90-98%) have been documented and 37 have voucher specimens.

Search for historical records - 893 historical (pre-1990) specimen records were located, representing 48 species of non-volant mammals. Of these, 31 species are clearly known from within the Park boundaries. Most of these records were from the collection of the Museum of Vertebrate Zoology at the University of California, Berkeley (MVZ), collected between 1929 and 1938.

Field surveys - Fieldwork conducted in 2000 involved trapping at 12 general localities within the Snake Creek and Baker Creek drainages, and 2 localities east of the Park boundary. In 2002, surveys were done at multiple sites at 4 general localities in Snake Creek and Strawberry Creek canyons. Survey work during 2003 focused on sites in Big Wash, near Pyramid Peak, and the Mount Washington-Lincoln Peak area. Cumulatively, 642 small mammals were captured. From all recent surveys, a total of 520 voucher specimens were prepared, representing a total of 26 species.

Opportunistic data collection - 23 specimens, representing 11 species, were obtained through salvage of dead animals or incidental capture. These specimens include the only Park vouchers for three species: gray fox, yellow-bellied marmot, and northern grasshopper mouse. Records of visual observations, tracks, or scat were obtained for 30 species.

Species requiring special consideration - Data indicate that particular species have experienced major declines during the past 70 years. The disappearance of woodrats at mid-elevations is particularly puzzling. Although there is no direct evidence, disease of some sort may be responsible. Another species of woodrat has experienced a dramatic decline due to infestation by a macroparasitic roundworm. The relative scarcity of golden-mantled ground squirrels, particularly at mid-elevations, may reflect increasing forest density due to fire suppression. Porcupines appear to have undergone a dramatic reduction, and may now be absent from the area. This reflects what may be a broad regional decline for this species. The specific factors responsible for these changes are unknown and certainly warrant future investigation.

RECOMMENDATIONS AND FUTURE WORK

Riparian management – Beaver have recently reappeared in the Park region and it is recommended that their reestablishment in watersheds be made a high priority. Beaver are invaluable for increasing local habitat diversity, and generally improving stream hydrology.

Mid-elevation communities - Open shrub communities at low to mid-elevations are being replaced by piñon-juniper and mountain mahogany woodland. Management efforts to reverse this trend and encourage the reestablishment of brush and grassland habitat would benefit several mammal and bird species that have recently declined.

Exotic plants - The invasion and spread of exotic plants, particularly cheat grass and other weedy annuals, is expected to have an increasingly negative impact on diversity and abundance of small mammals. Locally, an increase in exotic annuals is expected to depress certain species while promoting the spread of grass-loving species.

Monitoring of keystone species - Current efforts by Park staff to monitor carnivores, ungulates, and marmots are important and should continue because such species influence the broader structure of natural communities. These efforts could be extended to include the porcupine and to determine its role in the local dynamics of mid-elevation woodland and alpine forest communities.



Vagrant Shrew - Photo courtesy Eric Rickart, University of Utah