



MOJAVE NETWORK

Inventory Summary Report

INVENTORY OF AMPHIBIANS AND REPTILES AT MANZANAR NATIONAL HISTORIC SITE

INTRODUCTION AND OBJECTIVES

The Mojave Network, in cooperation with the USGS Colorado Plateau Research Station at Northern Arizona University, conducted a baseline inventory for amphibians and reptiles at Manzanar National Historic Site (MANZ) in 2002 and 2003. This inventory was identified as a high priority for the site, as no previous inventory had been done for these taxa.

Objectives for this inventory were to document the occurrence of reptile and amphibian species at MANZ, with the goal of documenting at least 90% of the species present, provide a voucher specimen for each species identified, and provide a GIS-referenced list and park-wide distribution of sensitive species known to be federally, or state-listed, rare, or worthy of special consideration.

Project Synopsis

Partner: USGS Colorado Plateau Research Station at Northern Arizona University

Principal Investigators: Trevor Persons and Erika Nowak

Documented: 10 Amphibian and Reptile Species

Project Duration: 2002 - 2006

Cost: \$49,939

METHODS

This inventory used a combination of non-random, general herpetological survey methods and standardized surveys at random locations. Sample points were randomly generated throughout the historic site, and both TACS and lizard line surveys were done at many of these.

Time area constrained searches (TACS) - TACS surveys consist of walking systematically through the sampling area for a specified amount of time, searching all areas and recording species data for all reptiles and amphibians encountered. Survey areas were 1 ha square plots centered on a randomly generated point location. Habitat data for these points was recorded, including dominant tree, shrub, and herbaceous plant species.

Lizard line transects - Lizard line transects were centered on the same random point locations as the TACS plots. These 100 m long and 15 m wide transects were walked repeatedly throughout the morning or afternoon, in order to detect peak activity. Species, age, size class, and sex for each lizard observed, as well as transect habitat data, were recorded.

General surveys - General surveys sampled habitats that were of high quality for reptiles or amphibians, or were not represented by TACS plots. These microhabitats were searched opportunistically. Data recorded included the area searched, start and stop times, weather conditions, and observations of all species encountered. Nocturnal general surveys were done to target aquatic habitats along Bairs Creek potentially used by amphibians. These surveys included

listening for calling amphibians, as well as searching for tadpoles and egg masses.

Pitfall traps - During the 2003 field season, ten pitfall traps were installed in microhabitats, near Bairs Creek, with the hope of detecting additional species. Traps were plastic 5 gallon buckets buried flush with the ground surface covered by a raised piece of plywood, to attract animals to the shade. In order to minimize ground disturbance and decrease visibility of the traps, drift fences were not used. Traps were checked at least daily.



Glossy Snake - Photo courtesy Trevor Persons

Nighttime road driving - Night driving surveys were done at 20-30 km per hour while scanning the road in the headlights of the vehicle. Surveys were done on administrative roads and the auto tour route. All animals encountered were identified and sex, age, and location were recorded.

Voucher specimens - The presence of amphibians and reptiles at MANZ was documented by collecting one individual of each species. Specimens were deposited in the natural history collection facility at DEVA and tagged with species, collector, date and site of collection.

Literature and museum specimen review - Although no herpetological specimens had previously been collected at MANZ, many specimens from the central Owens Valley were found. Online collection databases of two primary repositories of southern California material were also queried and experts familiar with aspects of the herpetofauna in the MANZ region were consulted.

RESULTS AND DISCUSSION

Ten species of reptiles were detected at MANZ, but no amphibians were observed. Based on the evaluation of potential occurrence of undocumented species, overall inventory completeness is estimated to be 50%. 770 individual reptiles were recorded and identified to species, of which 762 were lizards and only eight were snakes. The most commonly observed species were the Side-blotched Lizard and the Western Whiptail, accounting for 55% and 30% of all observations, respectively. Voucher specimens were collected for all species observed, except the Gopher Snake. Queries of the California Academy of Sciences and the Museum of Vertebrate Zoology yielded no records for the immediate vicinity of MANZ.

Rare, exotic, or sensitive species - None of the species documented were rare or of special management concern. In fact, most species at MANZ are widespread and abundant throughout much of the Southwest. The Southern Alligator Lizard is apparently rare at MANZ, but common just upslope the Sierra Nevada foothills.

Biogeography of the Manzanar Herpetofauna - The Owens Valley encompasses a broad transition zone between Great Basin Desert and Mojave Desert habitats, and this is reflected in the herpetofauna of the MANZ region. The intensive and concentrated human use of MANZ during World War II may also play a role in the current distribution of species at the site, as some species could have been locally extirpated during this occupation. Modifications of the hydrology of the valley, such as damming and diversion of local water sources, have caused extensive habitat changes. Species such as garter snakes and some amphibians may have occurred previously at MANZ, but may now be unable to recolonize the site due to lack of suitable habitat.



Desert Horned Lizard- Photo courtesy Trevor Persons

RECOMMENDATIONS AND FUTURE WORK

The full range of species present at MANZ may not have been detected with this inventory due to its use of random survey locations aimed at evaluating TACS and lizard line transect methods for possible use in long-term monitoring. Non-random survey techniques are more effective when compilation of a species list is the primary goal of a project. Future inventory work to establish baseline information for amphibians and snakes should be done during wetter periods. Surveying under surface objects when the ground is damp may turn up salamanders. Similarly, locating temporary pools after heavy rains may detect Great Basin Spadefoots. Continued road cruising surveys and increased pitfall trapping should detect snake species.

Long-term monitoring of amphibians and reptiles at MANZ should be initiated in a two-pronged approach. First, if adequate funding is available, permanent lizard line transects should be established to monitor the community of common, diurnal lizard species. Second, periodic complete species inventories are recommended. This would aid in the ultimate goal of completion of the species list, and simultaneously serve as general monitoring of overall diversity.