



Bat Blitz Brief for Parashant National Monument



Bats in Parashant National Monument

Parashant National Monument is jointly managed by the National Park Service and the Bureau of Land Management. It is located just north of Grand Canyon National Park and is known for its one-of-a-kind Dark Night Sky views and its remote and rugged landscape. It also has a large diversity of western bat species (a total of 17 were detected during a past inventory effort), including six sensitive bat species.

Regular monitoring of bat populations is becoming increasingly important with the rise of White-Nose Syndrome (WNS), a fungal disease affecting hibernating bat populations. WNS was first detected in New York state and over the past 12 years has spread across the east coast and midwest. Park managers

are concerned it will soon spread to western populations. Thus, having baseline data about bat populations before the arrival of White-Nose Syndrome is critical to ensuring the health of these important creatures.

To gather this baseline data, a Bat Blitz took place in June 2017 in the southwest section of Parashant. Table 1 lists the bat species detected and their method of detection: whether they were detected through acoustic sampling (using microphones that detect and record bat calls), or capture surveys (where mist nets are used to capture bats flying across an area or open pool of water), or both. Staff also used this Blitz as an opportunity to learn bat survey techniques.

Common Name	Scientific Name	Detection Method
Allen's Lappet-Browed Bat	<i>Idionycteris phyllotis</i>	Both
Big Brown Bat	<i>Eptesicus fuscus</i>	Both
California Myotis	<i>Myotis californicus</i>	Both
Canyon Bat	<i>Parastrellus hesperus</i>	Both
Fringed Myotis	<i>Myotis thysanodes</i>	Both
Hoary Bat	<i>Lasiurus cinereus</i>	Acoustic
Long-Legged Myotis	<i>Myotis volans</i>	Both
Mexican Free-Tailed Bat	<i>Tadarida brasiliensis</i>	Both
Pallid Bat	<i>Antrozous pallidus</i>	Both
Silver-Haired Bat	<i>Lasiorycteris noctivagans</i>	Both
Spotted Bat	<i>Euderma maculatum</i>	Acoustic
Townsend's Big-Eared Bat	<i>Corynorhinus townsendii</i>	Capture
Western Mastiff Bat	<i>Eumops perotis</i>	Both
Western Small-Footed Bat	<i>Myotis ciliolabrum</i>	Both
Yuma Myotis	<i>Myotis yumanensis</i>	Acoustic

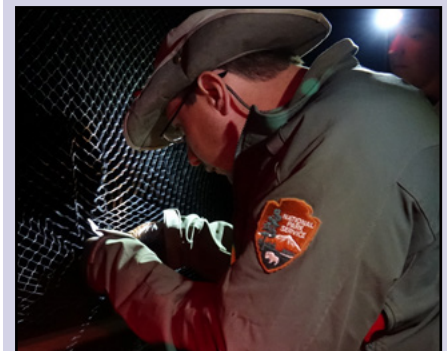
Table 1: 15 bat species were detected during the Bat Blitz, some through acoustic sampling, others through capture surveys, and still others through a combination of both. At all but one sampling location we paired a mist net survey with a bat detector deployed in the vicinity.

What is a "Bat Blitz"?

A Bat Blitz is a coordinated survey designed to sample the bat community within a specific area. For this Blitz, staff from Parashant National Monument were joined by the [Mojave Desert Inventory & Monitoring Network, Grand Canyon National Park, Mojave National Preserve, Death Valley National Park, Great Basin National Park, and Lake Mead National Recreation Area](#) as well as staff from the [Arizona Game and Fish Department](#).



Acoustic detectors are deployed using an ultrasonic microphone capable of detecting and recording bat echolocation calls of a wide range of frequencies.



Bats get caught in the mist nets as they swoop down to drink from pools of water. We carefully remove them from the net, collect and record data, and safely release them. Here a bat is being gently removed from a mist net.

Two Methods for Detecting Bats

Mist Net (Capture) Surveys

Mist net (capture) surveys are important because having bats in the hand is the only way to obtain certain kinds of information about them. We can tell the sex of the bat, measure it, weigh it and determine its age. In-hand examination can also give insights into its reproductive state and overall health. There are also bat species which are easier to recognize in the hand than acoustically.

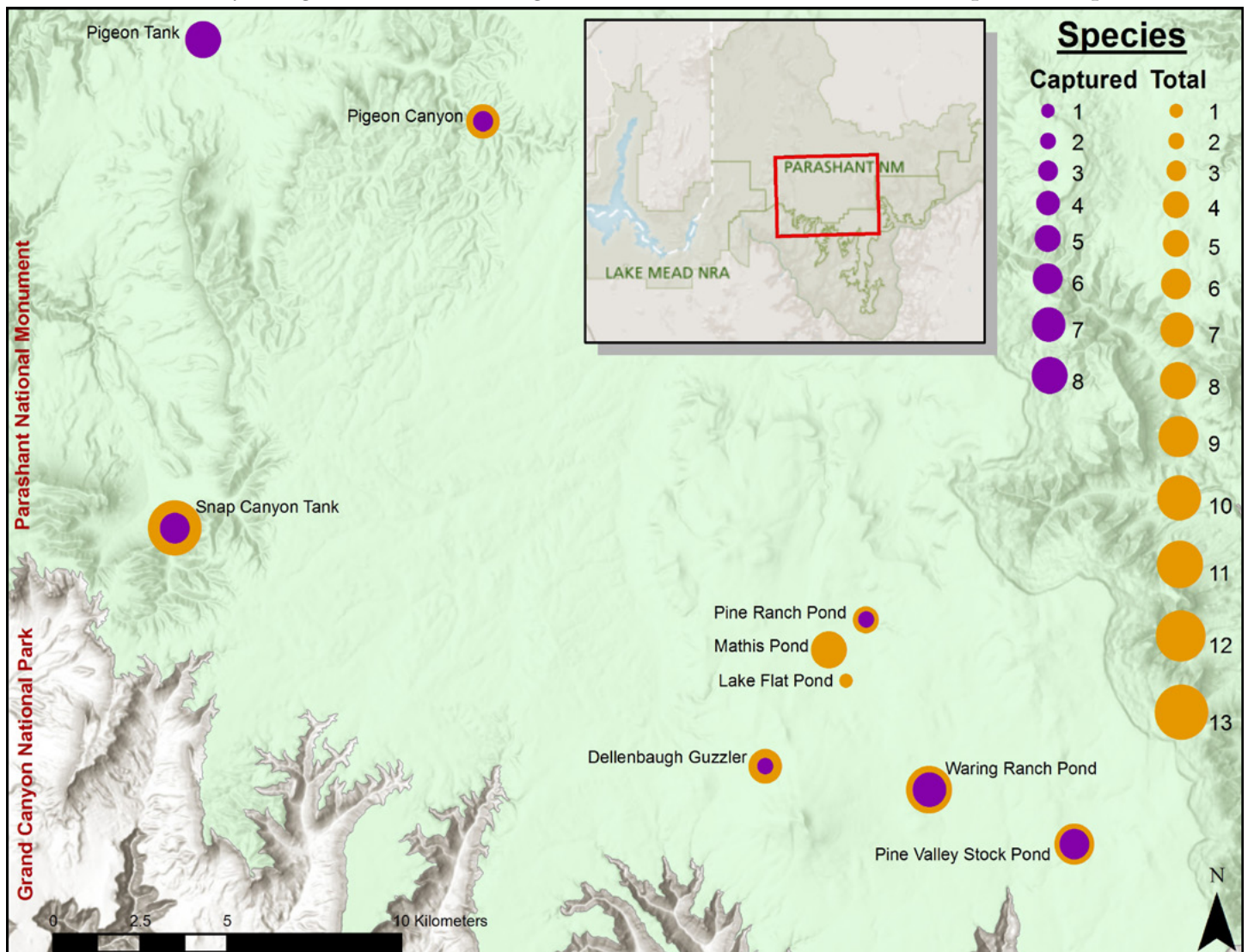
Acoustic Surveys

Acoustic surveys give us different kinds of information. Unlike humans, acoustic detectors do not get tired and effortlessly run all night, for weeks if desired. They also allow us to sample a much wider range of places, because capture methods only work where bats are vulnerable to capture. Some species, such as the higher flying bats, are easy to detect acoustically and often difficult to capture.

The key point? Both are important! Using both methods allows us to gather robust data about bat populations within the park and get a more complete picture of the bat species using a particular area.

Differences in Detection Methods by Site

The map below illustrates the number of different bat species recorded at 9 sites visited during the Bat Blitz. The difference in size between the purple dots (number of species detected by net capture) and the orange dots (total number of species detected by either net capture or acoustic methods) gives us an idea of how many species were *only* detected acoustically. For example, at Dellenbaugh Guzzler, 2 species were captured using mist nets, but 7 total species were detected through both methods. This means that 5 species were detected acoustically but not captured - we wouldn't have known they were there without the acoustic detector. By using both methods, we get more information about what bat species are present.

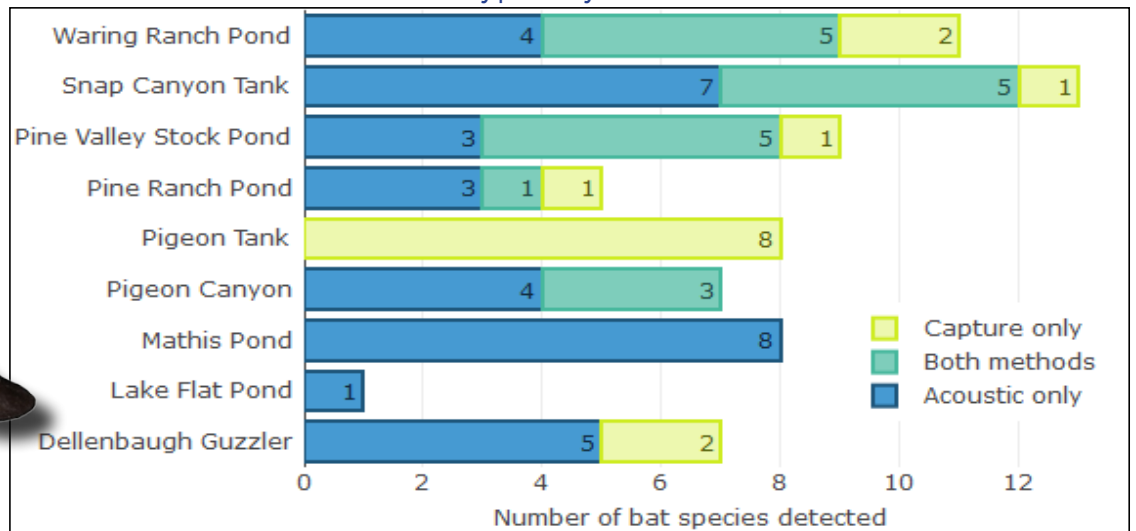


The difference in size between purple and orange dots represents the number of species captured in nets (mist net surveys) versus detected by both net and acoustic methods.

Total Bat Species Detected by Site

The graph below represents the same data presented in the map. It lists the number of different species detected at each site and the overlap between species detected by one method versus the other. For example, at Pine Ranch Pond a total of 5 species were detected (through both acoustic and capture methods). Most of these species (4 of the 5) were detected through acoustic methods. Although we caught two species in the nets (capture method), only one of those was a species not detected acoustically.

Detection Types by the Numbers



Detectors were only deployed during the 3-4 hours that nets were open whereas in normal acoustic-only surveys they are deployed all night, often for multiple nights. At two sites (Lake Flat Pond and Mathis Pond) we caught zero bats in the nets. Pigeon Tank had the highest number of species by capture (8 different species were captured in mist nets), and Snap Canyon Tank had the highest species by acoustic method (12 different species were recorded on the detectors). No acoustic detectors were deployed during the survey at Pigeon Tank.

Arizona Game and Fish Department swabs a Pallid bat to determine if it carries the fungus that causes White-Nose Syndrome.



During mist net capture surveys, data on weight, wingspan, and reproductive status of each captured bat are collected before the bat is safely and gently released.



A mist net (capture) survey crew sets up mist nets across a pond at their monitoring location before the sun sets.