



The Midden

The Resource Management Newsletter of Great Basin National Park

Two New Marmot Colonies Discovered

By Rosaleen Conrad

Two new marmot colonies were discovered in May in and near the park. These were important and exciting finds, since pinyon-juniper forests are expanding into sage-grassland habitat. As this happens, some small mammal populations are fluctuating, including the yellow-bellied marmot (*Marmota flaviventris*).

Resource management is studying how small mammals respond to changing habitat conditions and have started by conducting an inventory of small mammal populations. Of particular interest are marmot populations, which a resurvey in Nevada last year found greatly reduced. Within the park, twelve individuals are located in Baker Creek and use the road base to make their burrows. Additional marmot sightings have

been made in South Fork Big Wash and Lehman Creek, but these populations are not well documented.

During the week of May 24-28, two more marmot populations were found and confirmed. One was found in upper Strawberry Creek and the other outside the park in the Schell Creek range at McCoy Creek.

The population found at Strawberry Creek is a fairly large population based on the numerous piles of scat and burrows located on some large quartzite outcrops. This is slightly unexpected habitat, but below it is the more typical sloped rocky meadow and talus habitat.

The McCoy Creek colony was identified by finding a burrow site in con-

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Photo by Tana Ellis

Marmot on the lookout

Update on Bighorn Sheep

By Neal Darby

Our 2004 winter surveys for bighorn sheep found 12 individuals. After a long hike into Box Canyon to get a better look we were able to identify three ewes (adult females), three lambs, three young rams less than 4 years old, and three mature rams greater than three years old. One of the mature rams was our familiar green ear tagged ram. He was originally released by the Nevada Depart-



ment of Wildlife on Mt. Moriah in 1990 when he was two years old. He celebrated his 16th birthday this spring!

Seeing so many bighorn was great news because no bighorn could be found in the winter of 2003 and we feared the worst. Small populations are more prone to die-off from events such as wildfires, avalanches or dis-

ease outbreaks. The sheep have been known to historically spend the winter in Box Canyon, but our survey in 2003 failed to sight any, even while using a helicopter. One big difference between the winters of 2003 and 2004 was snow cover. There was substantially more snow in 2004 than 2003 and this likely determined just where the bighorn spend their winters. Now we just have to figure out where they spend winters with below average snowfall.

Getting out of the Heat

By Matthew Reece

The cave crew is going to be up at high elevation most of the summer. We are busy exploring and mapping the alpine caves of the park. In the park, any cave with an entrance at 9000 feet or higher is considered alpine; fifteen of the park's 43 caves fit this description, including the deepest cave in Nevada, as well as the cave with the highest elevation entrance in the state. In addition to mapping the known caves above 9000 feet, the crew will be looking for new caves in the southern part of the park. This area of the park is



Some caves will require a rappel just to get to the entrance

remote and very rugged, and has not previously been systematically checked for caves.

The majority of the park's alpine caves are incredibly technical, requiring complex, European-style rigging techniques and special equipment to safely traverse ropes. The caves, due to their high elevation, are also quite cold, requiring special clothing designed specifically for caving in cold, wet caves.

Check out the fall issue of the Midden for a report of what the cave crew found during the summer.

New Marmot Colonies

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junction with the diagnostic marmot scat. This habitat was located in a rocky meadow with a fairly steep slope, interspersed with large quartzite boulders at the base of which the burrows were typically found.

In looking at these two separate habitats it looks as though the typical marmot habitat is found on vegetated talus slopes or in meadows with rocky outcrops in expansive sage/steppe habitats. The rocks serve as support for their burrows and also as good sunbathing posts. Both habitats were located on southern slopes where it would be warmer than on northern slopes. This is important due to the fact that marmots hibernate for nine months of the year, and it is necessary not to waste any energy in generating more heat than is absolutely necessary.

Since marmots hibernate for most of the year in underground burrows, locating them can be problematic due to the fact that they are only active three months of the year, usually April through July. During these months most of the time above ground is spent feeding or sunbathing. Marmots are herbivores and they eat a wide variety of plants, but they especially like dandelions, clovers, and seeds.

Marmots can be found living in colonies or as paired animals. The typical colony situation involves a harem consisting of one adult male, several adult females and their offspring. The singly paired social groups are usually found in sites where the habitat limits the amount of burrows which can be built. Here one finds burrows inhabited by a single marmot, a pair, or a female and her young.

The recent discoveries of marmot colonies in natural habitat lead us to believe that the small population size of the Baker Creek marmot colony is likely due to the use of an atypical habitat. The main reason for this unusual habitat location is most likely due to the pinyon-juniper invasion which has greatly reduced their habitat. In studies it has been found that small marmot populations are more likely to be extirpated. Resource management is trying to avoid this by increasing the habitat potential near Baker Creek by thinning some of the pinyon/juniper near the sagebrush areas.

Please report any marmot sightings outside of Baker Creek to resource management.

Pygmy Rabbits Found in Park

Pygmy rabbits (*Brachylagus idahoensis*) were petitioned for listing to the US Fish and Wildlife Service in 2003. The Nevada Department of Wildlife (NDOW), under the direction of Dr. John Himes, began searching for pygmy rabbits to determine what their status was in the state.

Of 643 sites searched in the state, six were within the park. A pygmy rabbit was observed at one site, fresh pygmy rabbit burrows and pellets were observed at two sites, old pygmy rabbit pellets were observed at one site, and no pygmy rabbits or sign was observed at two sites.

The pygmy rabbit is found throughout the Great Basin desert and into some adjacent areas. They are usually associated with tall stands of old growth big sagebrush (*Artemesia tridentata*) and thus, within the park, are most likely to be encountered in the lower elevations, from about 4,500 ft to 7,000 ft. They have a very

distinctive alarm call, which may help them communicate with their neighbors in the dense sage. Predators include weasels, coyote, red fox, bobcat, and great horned owl.

Pygmy rabbits are shy and active at night. They dig their own burrows, and usually do not move more than 30 yards away from their burrow. They are the smallest member of the genus *Brachylagus*, with an average length of 11.5 inches. They look a great deal like cottontail rabbits, but have no white tail.

The findings from the inventory indicate that pygmy rabbits are not in imminent danger of being endangered. However, the encroachment of pinyon and juniper into the valley bottoms could pose a potential long-term threat to pygmy rabbits due to the gradual loss of suitable habitat. Thus, projects aimed at lessening the extent of pinyon-juniper encroachment should be considered and conducted where appropriate.



Pygmy rabbit



Pygmy rabbit burrow

Interesting Websites Related to the Park

Butterflies of Nevada
<http://www.npwrc.usgs.gov/resource/distr/lepid/bflyusa/nv/toc.htm>

Moths of White Pine County
http://www.npwrc.usgs.gov/resource/distr/lepid/moths/chklist/states/counties/nv_33.htm

Great Basin Wildflowers
<http://www.suu.edu/faculty/martin/Provinces/greatbasin/basinflowers.htm>

Natural Resources Conservation Service Plants Database
<http://plants.usda.gov/>

Great Basin Bird Observatory
<http://www.gbbo.org>

Spring Runoff Below Average in 2004

Lehman Creek contains a USGS water stage recorder about ½ mile inside the park boundary at 6730 ft. This water stage recorder measures the pressure of water over a transducer (the depth of water, or gage height) every 15 minutes, and then sends this data every four hours via satellite to the Nevada District Office. The stream flow (discharge) is calculated from this depth of water. Once a month a USGS technician visits the gage to check it and to conduct a streamflow measurement. This discharge measurement is then correlated with the gage height reading, and over time the USGS has developed a rating curve, so that for each depth of water they know how much water is flowing in the stream. Once a year the USGS analyzes all the data from the stream gage and corrects it based on the actual discharge measurements. Until the data has been analyzed, it is considered to be provi-

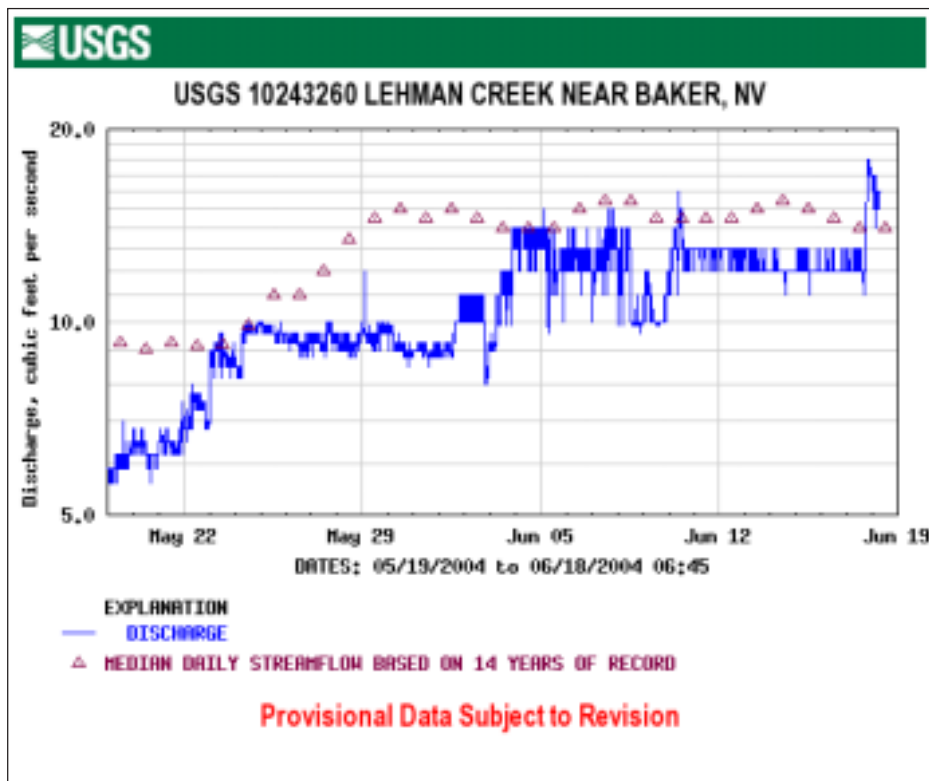
sional, which means that it may contain errors.

Graphs of both the discharge and gage height are provided on the website, along with additional information about past discharge. The Lehman gage has been in operation from December 1947 to September 1955, October 1992 to September 1997, and July 2002 to current year. Of these years, June 1992 had the highest monthly average discharge, with 19.2 cubic feet per second (cfs). January 1954 had the lowest month average discharge of 0.54 cfs. Looking at daily streamflow statistics, June 15th on average has the most discharge of the year, while February 19th has the least.

This year's spring runoff has been below average. The graph below shows this year's runoff as the dark

line, with small triangles indicating the median daily streamflow based on 14 years of record. Many years have one peak day for runoff, but this year the runoff has been more level, with small variations based on changing temperatures. The peak on June 17th was caused by the rain that day, with 0.67 inches falling at the visitor center. It will be interesting to see how the rest of 2004 compares with the average—perhaps since the spring runoff was not as large, the water will continue flowing in the creeks more steadily throughout the summer.

You can see the current gage height and discharge and past stream information at the following website: <http://waterdata.usgs.gov/nv/nwis/> Select Real-time data and click on the map to select the gage.



Researchers Find New Species in Park Caves

Researchers Jean Krejca and Steven Taylor were hired by the park to conduct biological inventories in eight park caves. The focus was on troglobitic species (those found deep in caves and that complete their life cycle within the cave), particularly macroinvertebrates. A variety of techniques were used such as nets, pit-falls, and hand collecting.

Previous studies had found the cave pseudoscorpion (*Microcreagris grandis*) in Lehman Cave, the Model Cave Harvestman (*Cyrtobunus unguulatus unguulatus*) in Model Cave, with another species of harvestman (*Sclerobunus robustus*) found in three park caves.

This study found the pseudoscorpion and harvestmen in additional caves, along with spiders, centipedes, springtails, beetles, darkling beetles, flies, ants, snails, wolf spiders, fungus gnats, worms, stoneflies, millipedes, true bugs, fleas, book and bark lice, and crane flies. The researchers also found some probable new species,



Millipede

including a cave adapted millipede, a globular springtail, and possibly other springtails and mites.

Most of these species, found deep in the caves, rely on the guano from troglomen (animals that use caves for part of the time, such as bats and mice) and from leaf litter debris washed in from entrances. Fungus and

bacteria then start breaking down the guano and leaf litter, and are in turn eaten by the larger macro-invertebrates. The researchers also observed pseudoscorpions eating flies in the cave.

This study provided a baseline of macroinvertebrate populations in eight park caves. Future research may include surveys in other park caves, studying pack rats to see if they are contributing to the food base of macroinvertebrates, studying the food chain and how it is maintained, and how surface events, such as fires, affect the subsurface.



Wolf spider



Electron scanning microscope photo of a pseudoscorpion

All photos courtesy of Jean Krejca and Steve Taylor.



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The Midden is the Resource Management newsletter for Great Basin National Park.

A spring/summer and fall/winter issue are printed each year. The Midden is also available on the Park's website at www.nps.gov/grba.

We welcome submissions of articles or drawings relating to natural and cultural resource management and research in the park. They can be sent to: Resource Management, Great Basin National Park, Baker, NV 89311
Or call us at: (775) 234-7331

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Upcoming Events:



July 8, 7 PM Snakes and Amphibians of Great Basin. Great Basin Association (GBA) Program, contact 234-7270 for more info.

July 17 & 18 Write the Wild. Campout and get inspiration to write about the wilds around you. GBA Program, contact 234-7270 for more info.

Sept 2, 7 PM Snakes and Amphibians of Great Basin GBA Program, contact 234-7270 for more info.

Sept 7 Star Night View the outstanding night sky through massive telescopes in Great Basin's clean air! GBA Program, contact 234-7270 for more info.

Sept 18 Osceola Out and Back. Hike 3 miles along Osceola trail and cookout. \$10 donation. GBA Program, contact 234-7270 for more info.

Sept 19 Star Night View the outstanding night sky through massive telescopes in Great Basin's clean air! GBA Program, contact 234-7270 for more info.

Sept 20 Rural Architecture Slide presentation examining how architectural styles, building materials, and ingenuity help rural people survive in Nevada's harsh environment. GBA Program, contact 234-7270 for more info.

Throughout the Year, Great Basin National Park Volunteer opportunities with resource management are available to help locate springs, conduct animal surveys, reclaim disturbed lands, and work on other projects. Contact us at 234-7331.