Park News
Great Basin National Park
National Park Service
U.S. Department of the Interior

# The Midden

The Resource Management Newsletter of Great Basin National Park

## South Fork Baker Creek: A Bonneville Cutthroat Trout Success Story


NPS Photo

Reintroducing Bonneville cutthroat trout into South Fork Baker Creek, one of five creeks in Great Basin National Park that now contain this native fish.

By Jonathan Reynolds, Biological Science Technician

South Fork Baker Creek begins at a series of springs located above 9,500 feet (2,895 m) elevation, flows for approximately 2.5 miles (4.0 km), and then combines with Baker Creek at 7,960 feet (2,425 m). The stream flows over a fairly steep gradient in the upper reaches until it enters a flat, grassy meadow. Downstream of the meadow, the stream enters a high gradient section that contains several small waterfalls. Due to its steep gradient, high elevation, and limited access, South Fork Baker Creek historically received less attention from anglers than the surrounding streams. However, records show that rainbow trout were stocked in the 1950s.

In 2000, Great Basin National Park discovered that Mill Creek harbored a population of pure Bonneville cutthroat trout (BCT) that could be used in the efforts to reintroduce this species throughout its historic home range. South Fork Baker Creek was selected as a candidate to become a BCT restoration area because Park staff believed that the high gradient and waterfall section located downstream of the meadow could be a natural fish barrier. In 2002, Park staff began removing nonnative trout from South Fork Baker Creek using a backpack electrofisher. The stream was electrofished at least twice a year from the proposed natural barrier to 0.3 miles (0.5 km) upstream of the meadow. The removal efforts ceased in 2005 after no fish were encountered during two visits to the stream that year. With the removal of all nonnative trout complete, 45 BCT from Mill Creek were reintroduced into the South Fork Baker Creek restoration area.

Population surveys conducted from 2007 to 2010 showed that nonnative trout had not migrated upstream of the natural fish barrier and that the BCT population was reproducing and expanding within the restoration area. However, it was also concluded that South Fork Baker Creek would benefit if additional BCT from Mill Creek were released in the restoration area to augment the population. It was decided that augmentation efforts should be focused upstream of the meadow where fish densities were lowest.

On September 12, 2012, a five person NPS electrofishing crew collected 36 BCT from Mill Creek. They were placed into a large, double-walled tank

*Continued on Page 2*

## In This Issue

## South Fork Baker Creek: A BCT Success Story (continued)

equipped with aerators and oxygen and transported by vehicle to the Baker Creek trailhead. Upon arrival at the trailhead the two smallest BCT, measuring 1.9 and 2.5 inches (48 and 64 mm), were missing. It was believed that they were either killed by the aerators or eaten during transportation. The remaining 34 BCT were placed into 5-gallon buckets and carried up the South Fork Baker Creek trail to the restoration area. Eleven of the BCT were released directly downstream of the meadow and 23 BCT were released between 0.15 and 0.35 miles (0.24-0.56 km) upstream of the meadow. All fish were acclimated to the stream temperature before being released.

The 2012 BCT population augmentation increased the densities and distribution of BCT in the South Fork Baker Creek restoration area. There are now healthy populations of BCT residing upstream and downstream of the meadow.

Over the next few years BCT should occupy all of the viable habitat in the restoration area. The natural fish barrier will continue to be monitored, and if needed, enhancements will be made to ensure that the restoration area is not compromised by the nonnative fish that still exist downstream.

## Baker Creek - Prehistoric Use of an Upland Drainage and Perennial Stream in the South Snake Range, Great Basin National Park

By Eva Jensen, Cultural Resource Program Manager

Thirty-nine recorded archaeological sites in the Baker Creek drainage of Great Basin National Park provide an opportunity to study how people use the landscape over long periods of time. Previous archaeological research focusing on large village sites and camps on the valley floors and foothills indicate upland zones also provided important resources and use areas. Archaeological sites have been identified from over 9500 feet elevation (2896 meters) in upland meadows to 6800 feet (2074 meters) on the stream edge near the park boundary. The Baker Creek drainage in the South Snake Range provides a variety of vegetation types, geology, and landforms across a wide elevation range.

Prehistoric sites span the Archaic through the Proto-historic cultural periods 8000 to 140 years ago. Some sites were reused by different cultural groups over time. Eight sites have Archaic style artifacts ranging from about 8000 years ago to about 2000 years ago (Figure 1). Radiocarbon (C14) dating from one site in the Baker Creek drainage gives absolute dating on rabbit fur cordage from the Archaic period at 2850 ±47 years before present (900 B.C.) and on corn dating to 1437 ±58 years before present (A.D. 513) in the Fremont culture period. Eleven sites have Fremont culture artifacts including arrow points, ceramics, and Fremont style rock art. Dates for Fremont are about A.D. 400 through 1300.

NPS Photo

**Figure 1. This broken Elko type projectile point was used during the Archaic period sometime between 8000 to about 1000 years ago. These were used as tips for thrown atlatl darts and spears.**

NPS Photo

**Figure 2. The Desert Side-notch point was used by Shoshone or Paiute people between A.D. 1300 and the late 1800s to tip lightweight arrows.**

Six later sites include Shoshone or Paiute artifacts of arrow points and pottery dating from about A.D. 1300 through the late 1800's (Figure 2). Site types include cave

*Continued on Page 3*

# Baker Creek - Prehistoric Use  (continued)

and shelter sites, rock art sites, and open sites of lithic (chipped stone) and ceramic scatters. Site locations include flood plains, terraces, canyon slopes, ridges, upland wet and dry meadows, and surrounding forested areas. Lower areas of the drainage were preferred with concentrations of sites in these areas showing intermittent use over thousands of years.

Geology of the Baker Creek drainage may be one factor in the choice for site location by prehistoric people. Pole Canyon limestone exposed in the Pole Canyon formation at Grey Cliffs and Baker Creek Narrows provides karst geologic landscape with caves and alcoves suitable for shelter. Nearly vertical rock walls and even isolated boulders are suitable for rock art, pictograph, and petroglyph panels. Upstream from the narrows, deposits of reworked glacial till provide rocks and boulders of  Cambrian Prospect Mountain quartzite suitable for making stone tools including knives, scrapers, dart and arrow points (Figure 3).

Vegetation mapping shows a range of dominant species at upper elevations from mesic spruce-fir, aspen, ponderosa pine, montane sagebrush, mountain mahogany, and mixed conifer. Lower drainage areas include mountain mahogany, aspen, basin wild rye-montane big sagebrush, pinyon- juniper, and aspen. Riparian areas are scarce in the Great Basin, comprising about 1.4% of

NPS Photo

**Figure 3. Prospect mountain quartzite moved from upper elevation by glaciers provides material for stone tools.**


NPS Photo

**Figure 4. This mano (hand-held grinding stone) was used to process seeds and pinyon**

NPS Photo

**Figure 5. The pictograph of big horn sheep indicate the importance of upland hunting for Fremont culture at about A.D. 1200.**

vegetation area in the Park; however, these areas provide a high percentage of important ethno-botanical resources. Baker Creek riparian plants include chokecherry, elderberry, wood rose, stinging nettle, and columbine. These species are known for use as food, fibers, and healing remedies.  Other useful plants found on terraces and hill slopes include pinyon nuts and basin wild rye seed gathered for food (Figure 4). Aspen, mountain mahogany, juniper, and manzanita are known for curing remedies. Woody parts of mahogany and juniper are known for sturdy bows. Winter lodges of Shoshone people incorporated juniper trunks and branches (Moerman 1998).

Upper elevations of Baker Creek drainage provide habitat for bighorn sheep. Remains of at least five bighorn sheep recovered from the Baker Village site on the floor of Snake Valley indicate upland hunting connections. Rock art lower in the canyon depict bighorn sheep, indicating these animals played an important role in subsistence and perhaps, prestige hunting for the Fremont culture around A.D. 1200 (Figure 5).

The Great Basin is an arid region. Over the millennia people incorporated upland and riparian areas to provide important resources from plants, animals, stones, and special landscape features. Future research will incorporate recorded site information in other drainages, expanding understanding about resource and landscape use in the Great Basin over thousands of years.

Reference

Moerman, Daniel E. 1998. *Native American Ethnobotany*. Timber Press. Portland, OR.

# Pleistocene Cave Fauna Found at Great Basin National Park

By Gorden Bell, Paleontologist

Great Basin National Park's resource management staff recently discovered an exciting Pleistocene vertebrate fauna in Snake Creek Cave. The discovery marks the first time that definitive pre-Holocene fossil vertebrates have been identified in any of the park's 43 known caves. Trips to the cave in September and December 2012 produced discoveries of thin, bone-bearing sediment deposits in at least six different locations, as well as one area of deeper stratified fossiliferous deposits.

During these two visits the team found a number of what appeared to be fossilized bones and teeth exposed on and immediately below the surface of the sediments. A few samples were removed to better assess the character of these deposits. The samples were subsequently dried and washed, and the resulting concentrate searched under a dissecting microscope to find teeth, jaws, and distinctive bones. These fossils can then be compared to skeletons of modern animals to determine what animals lived in the vicinity of the cave when the mountains of the Snake Range were being carved by active glaciers.

A lot of work remains to be done, but the fauna identified so far is dominated by rodents and rabbits. Some of the more exciting of those include pika mandibles and teeth, pygmy rabbit teeth, and a mandible and tooth of the extinct rabbit,


**The extinct rabbit, *Aztlanolagus agilis*, lateral view of a left dentary missing all its teeth; quarter is 2.5 cm in diameter.**

*Aztlanolagus agilis*. The bones and teeth of this species are also known from two caves in the North Snake Range and caves in Colorado, New Mexico, west and central Texas, and Chihuahua, Mexico, as well as stream deposits in southeastern Arizona. This was a small rabbit, slightly larger than the pygmy rabbit, but was long-legged and probably inhabited more open environments similar to those occupied by jackrabbits. *Aztlanolagus* appears not to fit the normal extinction pattern common to the Pleistocene. While most of the animals that became extinct were very large mammals, this rabbit is the only small mammal in North America that died out along with the large mammals. There is also some evidence from Carbon 14 dating to suggest that it became extinct before the end of the Pleistocene, possibly even before the last glacial maximum.

Some of the more common rodent fossils are from marmots – large members of the squirrel family. The numbers of large curved incisors, cheek teeth, and jaws suggest that the Snake Range supported much greater populations of marmots in the Pleistocene than it does today. Other sciurids are represented by teeth and jaws of small squirrels and chipmunks. As usual, the most common fossils are teeth and jaws of wood, or "pack," rats. We have also found two types of voles and many deer mice teeth.

Shrews so far are represented by rare jaw sections, but remains of bats are surprisingly even more rare. Carnivores are rare also with only one weasel jaw and several small loose teeth. Large mammals are represented by 3 hoof bones, one vertebra, and some loose teeth. One of those teeth could possibly be from a small camel, but this has not yet been verified by experts. The cave shows no apparent breakdowns or other indications of sinkholes or traps that would have allowed larger mammals to fall in and become fossilized. Therefore, the pieces of larger mammals that have been found so far may have been brought in by pack rats and so we may never find any of the larger bones of larger mammals. Nevertheless, the utility of the smaller mammals cannot be understated as they provide a deep-time window into changing environmental conditions in the Snake Range and the mountains of the interior Great Basin. These fossils may very well give more clues about how many kinds of animals responded to previous climate change events.

Non-mammal fossils from Snake Creek Cave include a few fish bones, one piece of a frog,

*Continued on Page 5*

# Pleistocene Cave Fauna (continued)


NPS Photo by Gorden Bell

**Incisors, cheek teeth, and partial jaw bones without teeth of *Marmota flaviventris*. Quarter is 2.5 cm in diameter.**

several bird bones including a large raptor, and many pieces of lizards and snakes. The lizards include jaw bones with teeth, skull parts, and numerous vertebrae. So far only one lizard has been identified to species – a skull bone of the horned lizard, *Phrynosoma platyrhinos*. But much work remains to be done to identify the lizards and that list will no doubt expand. Identification of the snakes involves recognizing species based mainly on the shape of vertebrae, which is a tedious process, but so far we know that there are some rattlesnakes and at least three or four types of non-poisonous colubrids present.

It has never been verified if Pleistocene faunal materials were recovered during early excavations in the park's flagship cave, Lehman Cave. Horse teeth and bones found in archeological excavations there in 1963 have yet to be compared to fossil horses and there is no indication that any of the faunal materials were submitted for radiocarbon dating. However, in Snake Creek Cave the presence of *Aztlanolagus* provides definitive evidence that the associated fauna is, at a minimum, Pleistocene in age. According to published literature, where *Aztlanolagus* is associated with radiometric dates, these are all 25,000 years old or greater. Thus, there is some indication that older portions of the fauna may be concordant with or possibly even prior to the last glacial maximum of the Wisconsinan glaciation which occurred between 26,500 and 19,000 years ago. The next step to determine a more precise age of the fossils is to submit some of the larger bone fragments for radiocarbon dating.

# Recent Publications

Hamilton, B. T., R. Hart, and J. W. Sites. 2012. Feeding ecology of the milksnake (*Lampropeltis triangulum*, Colubridae) in the western United States, Journal of Herpetology 46:515-522.

Kitchen, S. G. 2012. Historical fire regime and forest variability on two eastern Great Basin fire-sheds (USA). Forest Ecology and Management 285: 53–66.

Mensing, S., S. Strachan, J. Arnone, L. Fenstermaker, F. Biondi, D. Devitt, B. Johnson, B. Bird, and E. Fritzinger. 2013. A network for observing Great Basin climate change. EOS 94:105-107.

Tang, G. and J.A. Arnone III. 2013. Trends in surface air temperature and temperature extremes in the Great Basin during the 20th century from ground-based observations. Journal of Geophysical Research: Atmospheres: 118:1-11.

Tweet, J. S., V. L. Santucci, and A. P. Hunt. 2012. An inventory of packrat (*Neotoma* spp.) middens in National Park Service areas. *In* Hunt et al., eds., 2012, Vertebrate Coprolites. New Mexico Museum of Natural History & Science, B. 57.

# Preliminary Results of Stable Isotope Analyses of Water Samples

By Kathryn Bullinger,
Department of Geography, Ohio State University

In August 2012 I had the opportunity to assist researchers from Ohio State University (OSU) Department of Geography with fieldwork in physical geography at Great Basin National Park. OSU Geography has been working in the Park since 2005, monitoring temperature and humidity at various elevations and locations, sampling water and measuring stream flow in the Baker Creek and Lehman Creek catchments, recording temperature profiles in the subalpine lakes and investigating the climate history of the area through analysis of sediment cores retrieved from Stella Lake. During my time in the Park I helped service the temperature and relative humidity dataloggers, took water samples and measured stream flow at several points along the creeks. Upon my return to OSU I undertook an independent study to look at the isotopic makeup of some of the water samples we had taken.

Isotopes are basically different forms of an element (e.g., hydrogen and oxygen) that have a different atomic mass due to the presence of different numbers of neutrons in the nucleus. In the case of hydrogen there are 2 isotopes of interest: $^{1}H$, which is regular hydrogen, and $^{2}H$, or deuterium, which is slightly heavier and far less abundant. For oxygen the relevant isotopes are $^{16}O$, which is most abundant, and $^{18}O$, its slightly heavier, much less abundant relative. Isotopic analysis involves measuring the abundance of the different stable isotopes of oxygen and hydrogen present in a sample and then comparing these to their abundance in a standard water sample. The values I calculated are $\delta HD$ and $\delta^{18}O$, negative values of which reflect a lower abundance of $^{2}H$ and $^{18}O$, respectively, than the standard water sample. Conversely, positive values of $\delta HD$ and $\delta^{18}O$ represent the situation in which the abundance of $^{2}H$ and $^{18}O$ is higher than in the standard sample.

Isotopic analysis is important in climatology because concentrations of stable isotopes in rainwater or snow vary with the conditions at which the precipitation formed in the water cycle. While lighter isotopes evaporate preferentially, heavier isotopes will better condense and precipitate, leaving relatively lighter isotopes in air masses as they move further from a water source (oceans or lakes), and heavier isotopes in the water. This is moderated strongly by temperature. For example, in the cold global climate during the ice ages of the Pleistocene era, water evaporating off the oceans would have more negative values of $\delta HD$ and $\delta^{18}O$ because there was less energy available to vaporize these slightly heavier molecules compared to today. The water vapor that went into the formation of the Pleistocene glaciers would be characterized by distinctly negative values of $\delta HD$ and $\delta^{18}O$ as would the meltwater from those glaciers. Similarly, snow forms at colder temperatures than rain, and will usually have a

The author with Scott Reinemann, servicing dataloggers at the Rock Glacier.

more negative isotopic signature. It is therefore expected that the melt coming from a feature such as a rock glacier, as well as annual snow pack stored for a given year in GBNP, would have relatively more lighter isotopes than the water in the lakes, like Stella. Moreover, in warm years, or with less snowpack, there might be more evaporation, and lakes would show heavier (less negative) isotope values.

Of course there are many factors contributing to changes in values of $\delta HD$ and $\delta^{18}O$ in water sampled in the Park and it will take more analysis and probably more sampling at higher frequency than once per year to fully characterize the patterns of variation of stable isotopes within the Lehman Creek and Baker Creek catchments. A good first step, however, is to look at the inter-annual variability in the samples taken over the years at various locations. For my project I determined values for $\delta HD$ and $\delta^{18}O$ for samples taken from 14 sites in the Park between 2005 and 2012. The values from Stella Lake and "Lehman Spring 1" (a spring which originates north of Stella Lake and flows downward into Lehman Creek)

*Continued on Page 7*

# Stable Isotope Analyses of Water Samples (continued)

are illustrative of the results from all 14 sites and are depicted in Figures 1 and 2, respectively.

A few important observations are noteworthy: (1) Stella Lake isotopes are much more variable from year to year, which reflects inter-annual variation in rates of evaporative loss relative to inflow; (2) the spring values do not vary inter-annually, and are consistently at the more negative end of the range. This indicates that the spring is recharged at higher and colder elevations, likely by snowpack, while certain years with more snowmelt (and thus higher lake levels) end up with more negative isotopes in the lake (e.g., 2005 and 2011). All the lakes are consistent in this pattern.

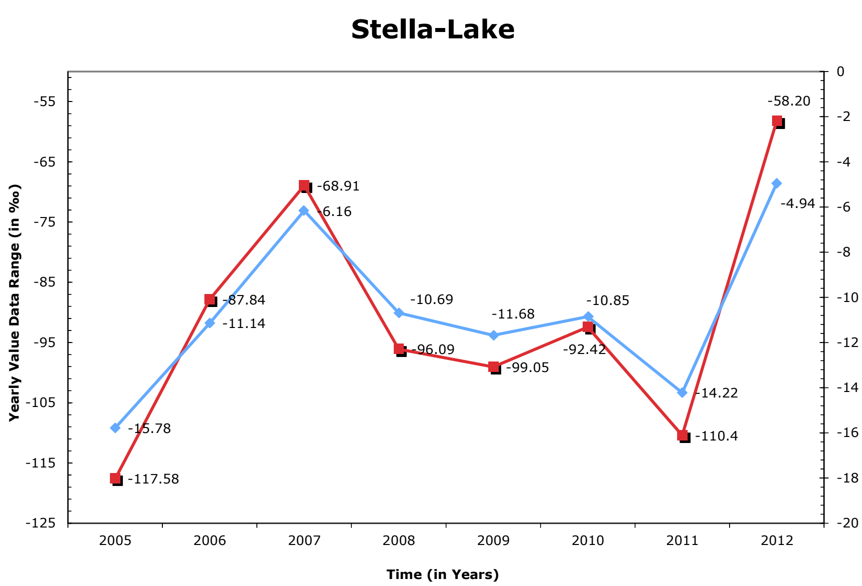


**Figure 1. Values of δHD (blue line, left axis) and δ18O (red line, right axis) for water samples from Stella Lake.**

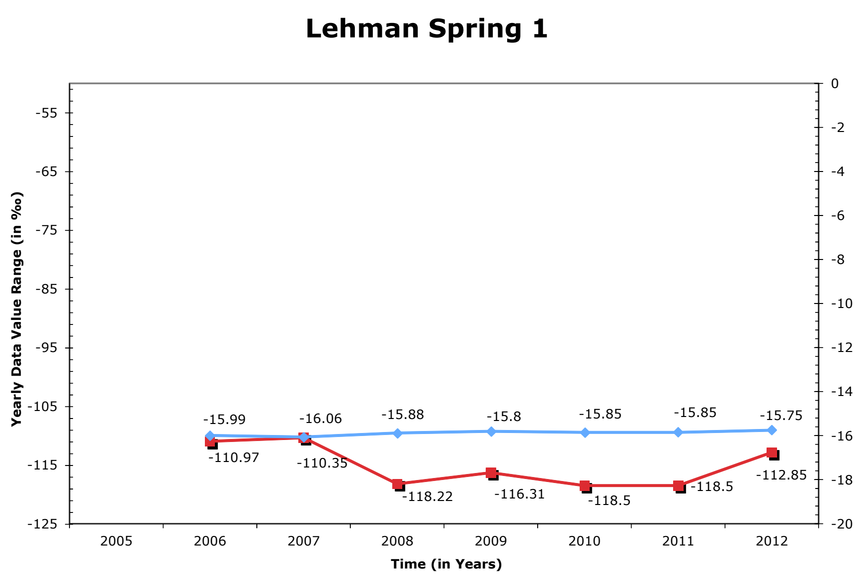


**Figure 2. Values of δHD (blue line, left axis) and δ18O (red line, right axis) for water samples from "Lehman Spring 1".**

These are just 2 of the 14 sites I analyzed for my study. There is inter-annual variability at each site, reflecting the fact that the isotopic makeup of the stream at each site is not constant through time. Most sites showed similar trends in variation while the magnitude of the variations was in some cases greater and, in some cases less. More work is needed to tie these values to variation in other climate factors such as local temperature, precipitation and snow pack: more opportunities for future OSU Geography students!

Overall, this experience has been very beneficial to me. After completing my undergraduate studies at The Ohio State University, I aspire to take up a career in the field of geography and earth sciences, specifically one related to hydrochemistry. All of the valuable lessons learned on this trip, and in the months following while analyzing the data will be highly advantageous while pursuing this goal.

**Arachnid BioBlitz**
**Help find spiders, mites, scorpions and more!**
**July 8-10, 2013**

Contact Gretchen_Baker@nps.gov for more info.

# Cheatgrass Control and Eradication Techniques Studied

By Patrick Mingus, Biological Science Technician and Bryan Hamilton, Wildlife Biologist

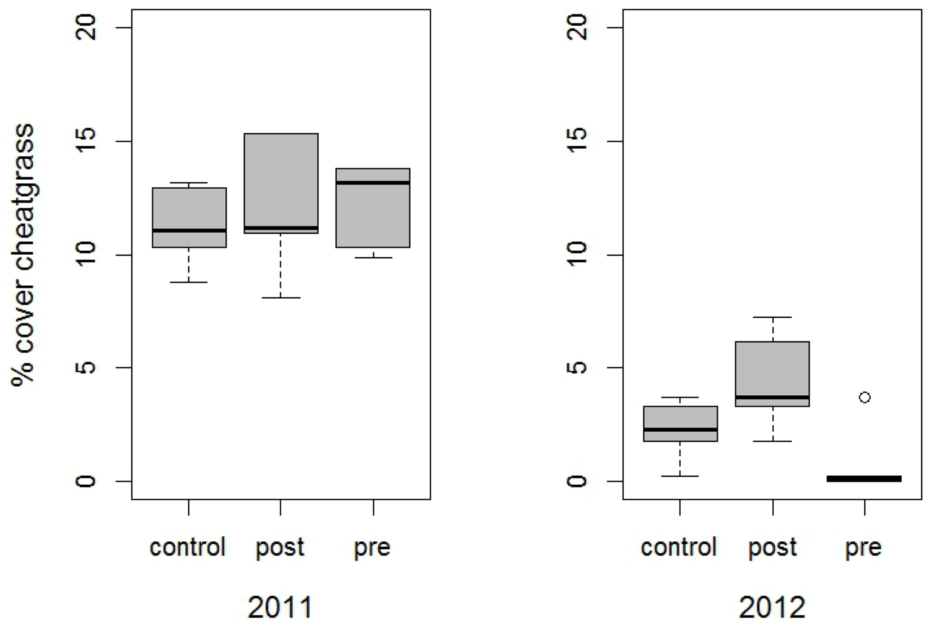


**Figure 1. Differences in cheatgrass cover between 2011 and 2012 can be largely attributed to low precipitation and low germination. 2012 data show that pre-emergence herbicide treatments pushed germination down further relative to controls and post-emergence treatments.**

In Autumn 2011, Great Basin National Park Resource Management staff created experimental plots in the Cave Springs area of Great Basin National Park to analyze and monitor the most effective treatment techniques for control and eradication of cheatgrass (*Bromus tectorum*) from the park. Cheatgrass is an annual bunchgrass from Eurasia, usually germinating in the autumn, overwintering as a seedling, then flowering in the spring or early summer, and later dropping its seeds. Cheatgrass seeds remain viable on the desert floor for up to five years if the infestation has time to build up a seedbank. A seedbank is the accumulation of viable seeds in soil near the parent plant, stored until conditions are favorable for germination and growth. Seedbanks help replant species after winter, drought, and disturbance events. Native seedbanks are important in the Great Basin because harsh and unpredictable conditions are the norm. However, invasive seedbanks can germinate months or even years after the control measure has occurred. It is important to document and monitor treatment plots over several consecutive growing seasons to determine if additional actions will be necessary to successfully exhaust the cheatgrass seedbank.

Plots were laid out randomly to contain several different cheat grass treatment methods, including pre- and post-emergent herbicide applications and subplots with and without native seeding, as well as untreated control areas. Imazapic, a branched-chain amino acid inhibitor herbicide, was applied to various subplots before or after cheatgrass emerged and began actively growing. It caused no damage to native grasses in our treatment areas.

Data from 2011 showed no signficiant difference between treatment methods, but 2012 data showed that pre-emergent herbicide treatments resulted in greatly reduced cheatgrass cover compared to post-emergence herbicide treatment and the control. Cheatgrass treatment plots will be monitored throughout the growing season and evaluated at six-month intervals through 2015 to help determine the most effective treatment techniques to restore native plant communities and remove cheatgrass from disturbed areas in Great Basin National Park.

More reading:
http://www.invasivespeciesinfo.gov/plants/downybrome.shtml

**Treatment plots near Cave Springs.**

# The Importance of Riparian Habitat to Small Mammal Diversity

By Bryan Hamilton, Wildlife Biologist

Small mammals are an important component of ecological diversity. Seed caching by small mammals enhances plant germination, burrowing aerates soils, cycles nutrients, and maintains early seral state plant communities. As the prey base for many predators, small mammals are an important trophic link in food webs. Habitat affinities of non-volant small mammal species range from xeric adapted species, such as kangaroo rats *(Dipodomys ssp.)* that do not require drinking water, to species such as shrews and voles that are strongly associated with streams and mesic riparian habitats.

I examined the evidence that riparian areas are critical habitat for small mammals through a literature search. Fifteen studies compared small mammal diversity between upland and riparian habitats. Seventy-one percent of the studies found higher small mammal diversity in riparian areas. Sixty percent found higher species richness, 73% higher density, 20% higher evenness, and 60% found riparian habitat contributed to higher gamma diversity through species turnover between habitats. These trends are consistent with small mammal data from Great Basin National Park (Figure 1).

Why is small mammal diversity generally higher in riparian areas than in uplands? The strongest diversity trends show greater small mammal density in riparian areas (Figure 1). This suggests that riparian areas provide higher quality habitat than uplands. In arid regions, many small mammal populations are limited by food availability as meditated by precipitation (Morrison et al. 2002). Given the higher production of riparian habitat relative to uplands, it is reasonable to hypothesize that riparian areas are utilized extensively by small mammals for food and cover from predators (Figure 2). In addition to greater food availability, food may be higher quality due to the availability of soil moisture. Some small mammal species, such as voles, derive nearly all their carbon from riparian resources, while upland species such as canyon mice and chipmunks derive none of their carbon from riparian resources.

Riparian areas are critical habitats for the conservation of small mammal communities in the Great Basin. Seventy to ninety percent of all natural riparian areas in the United States have been extensively altered or lost in the United States in the last 200 years (Popotnik and Giuliano 2000). Riparian areas face continued threats from overgrazing, roads, water development, non-native species, and groundwater withdrawal. Establishing the mechanisms relating increased small mammal diversity, resource use, and riparian habitat is crucially important to the conservation of biodiversity in arid areas.

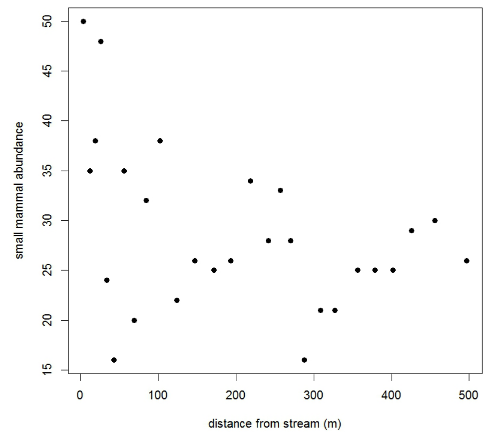


**Figure 1. Small mammal densities decrease as a function of distance from streams. This suggests greater resource availability in riparian areas than uplands.**

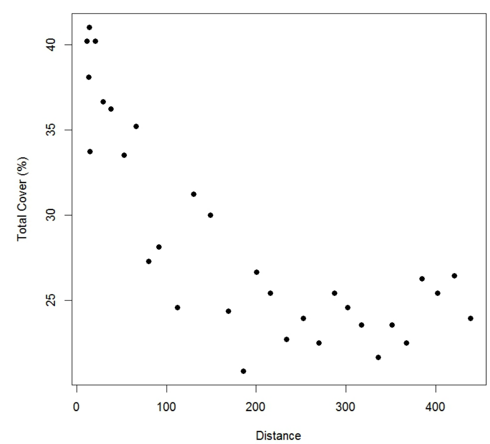


**Figure 2. Plant cover deceases with increasing distance from streams. Increased plant production in riparian areas may provide additional food or protection to small mammals.**

Literature Cited

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National Park Service
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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:
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Great Basin National Park,
Baker, NV 89311
Or call us at: (775) 234-7331

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## What's a midden?

A midden is a fancy name for a pile of trash, often left by pack rats. Pack rats leave middens near their nests, which may be continuously occupied for hundreds, or even thousands, of years. Each layer of trash contains twigs, seeds, animal bones and other material, which is cemented together by urine. Over time, the midden becomes a treasure trove of information for plant ecologists, climate change scientists and others who want to learn about past climatic conditions and vegetation patterns dating back as far as 25,000 years. Great Basin National Park contains numerous middens.

**Great Basin National Park**

# Lint Camp Removes Nearly a Ton of Debris

NPS Photo

**Participants in the February 2013 Lehman Cave Lint Camp removed nearly a ton of sand, lint, and other debris from the cave.**

By Gretchen Baker, Ecologist

Over two days in early February, twenty-eight participants came from Utah, Nevada, and California and volunteered over 200 hours to clean parts of Lehman Cave. This lint camp did much more than remove lint clinging to delicate formations. Participants also removed buckets of sand. Some of the sand dated to over 80 years ago, when it had been brought in to make trails in the cave. Other sand had been brought in as sand bags to help protect delicate areas of the cave when some passages were enlarged. When volunteers removed the sand, they found natural cave features underneath, including some beautiful rimstone dams in the Lodge Room. Participants also removed components of the old lighting system, old rusty nails, and a couple of pennies as part of the 1,900+ pounds of lint, hair, sand, and old trail debris removed from Lehman Cave.

The park is really grateful to all the volunteers who made this happen. In addition to knowing that they have helped restore the cave to a more natural ecosystem, volunteers were also rewarded by close-up views of cave biota, including a pseudoscorpion that is only found in the Park, and a behind-the-scenes tour of the Talus Room for participants.

## Upcoming Events:

**July 8-10 Arachnid BioBlitz:** Join the fifth annual BioBlitz open to professionals and citizen scientists. Contact Gretchen_Baker@nps.gov.

**August 12 Perseids Meteor Shower:** Watch the year's most active meteor shower with Great Basin's Dark Sky Rangers

**September 5-7 Astronomy Festival:** Peer though many telescopes at some of the darkest night skies in the nation. Check the park website for details.

**May 24-September 2 Lehman Cave Tours** daily at 8:30, 9:00, 10:30, 11:00, 12:30, 1:00, 2:00, 2:30, 3:00 and 4:00. September - May: Tours at 9:00, 11:00, 1:00, and 3:00. Advance ticket sales 775-234-7517.
**Visitor Center open** daily except Thanksgiving, Christmas, and New Years Day