Baker Creek Prescribed Fire

by Elizabeth Cristobal

As you drive up the Baker Creek Road, look to your right at the triangular shaped hillside across from the Baker Creek Campground, and you will see the site of the Baker Creek Prescribed Fire. This fire will be implemented in 2002 when all conditions are met (e.g., wind speed, relative humidity). Some of the objectives for this burn are: to restore native grasses, to reduce white fir, to reduce encroachment of pinyon-juniper and to increase habitat for ungulates. This burn was previously attempted in 1998, with approximately 10 acres completed at that time.

This burn will bring together local cooperators, including Bureau of Land Management, Forest Service and Nevada Division of Forestry, in addition to fire staff from other National Park Service units. For more information, contact Elizabeth Cristobal, Fire Management Officer, at 234-7331.

Baker Creek Snow Courses

by Fred Gender

When snows of winter paint our landscape, the thoughts of many turn to winter fun and awe at the spectacular scenery. However, the recreational and aesthetic appeal of snow is only part of the story. Snowpack is the primary water source in the western United States.

The mountain ranges of the West contain vast amounts of snowpack that supply 50 to 80 percent of the year's water supply. But, nature doesn't always provide us with a consistent and dependable supply of water to meet our growing needs. Reservoirs are constructed to help mitigate fluctuations from year to year but effective water management requires the knowledge gained by effective snowpack monitoring.

Snow surveys are conducted at specific times of year in order to accurately describe the extent of the year's snowpack and determine its water content. Gathering this data requires specially trained people and unique equipment. The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) directs the efforts of federal, state and private cooperative snow survey programs in order to keep pace with the ever increasing demands on limited water resources.

Snow survey data is collected at 1,200 snow courses throughout the country several times a year. One method mixes modern technology and nature. Remote radiotelemetry sites bounce information off of the meteor belt some twenty-five miles above earth to a master station where the data is compiled and analyzed. The second method, manual surveys, is the one that is utilized at Great Basin National Park (GRBA).

At designated snow course sites a two-person team measures the snow depth and water content of the snowpack. Great Basin National Park's team members are Rob Ewing and John Woodyard. They measure the snowpack from February to April at GRBA along a 1000 foot-long snow course in Baker Creek. Station #1 is at an elevation of 8,220 feet, #2 is at 9,200 feet and the #3 is at 9,520 feet. The team takes 5 to 20 measurements at regular intervals along the snow course using a lightweight graduated aluminum tube and a scale. The snow depth is determined when the tube is pushed into the snow to the ground. When the tube is removed the core of snow is weighed using a scale that reads directly in "inches of snow water equivalent." All measurements along a snow course are averaged and represent the snow course's snow water equivalent and depth. Snow measurements have been collected at the Baker Creek snow courses since 1942.

The information obtained from the snow surveys is used by reservoir operators, irrigation districts, cities, wildlife and water managers for a wide variety of purposes. The information helps sectors of agriculture, industry, and recreation base their water management decisions on snow survey data, water supply forecasts, flood forecasts and drought risk assessments.

Looking at snowpack data since 1986, when Great Basin National Park was established, the average snow water equivalent (SWE) is 10.7 inches. High snowpack years were 1986 (14.7"), 1993 (18.7") and 1995 (14.8"). Low snowpack years were 1989 (7.0"), 1991 (6.4") and 1999 (6.0").

How does 2002 look? Ten inches of snow water equivalent were measured along the Baker creek snowcourse, which is 93% of the 17-year average. However, the Nevada Water Supply Outlook from May 1, 2002 reports that snowpack conditions in Eastern Nevada are well below average, with snow water content 56% of the May 1 average and 53% of the snow water content of last year.

For more information on this subject check out these internet sources:

NRCS Snow Survey, water supply and drought monitoring, www.nhq.nrcs.usda.gov/ccs/snoserv.html

NRCS National Water and Climate Center

www.wcc.nrcs.usda.gov

Nevada Snow Survey Program

www.nv.nrcs.usda.gov/snow.htm

Utah Snow Survey Program

www.ut.nrcs.usda.gov/snow.htm

Fisheries Restoration

by Gretchen Schenk

During the 2002 field season, the fish crew will reintroduce native Bonneville cutthroat trout (BCT) to Strawberry and South Fork of Big Wash creeks, monitor macroinvertebrates, and conduct a renovation treatment on Snake Creek. This treatment will eliminate nonnative brook trout from about four miles of the creek upstream of the pipeline so that BCT can be reestablished.

Why treat?

Fisheries restoration projects often require removing nonnative fish that are present in the stream and replacing them with native fish. Tools to do this include increased angler pressure, electrofishing and chemical treatments.

Increased angler pressure only works if all the fish are of catchable size. Since most streams have young-of-the-year present that are only two to three inches long, this alternative is rarely feasible. Electrofishing, which uses an electrical current to stun fish, can be used to remove large numbers of fish. However, many fish can sense the current coming and hide deep under overhanging banks or in other inaccessible areas where the netters cannot reach them. Thus for many fisheries restoration projects, chemical renovations are the only sure way to remove all the nonnative fish. Two chemicals are commonly used, rotenone and

antimycin. Great Basin National Park used rotenone to treat Strawberry Creek in 2000 and plans to use antimycin in 2002 to treat Snake Creek.

Rotenone

Rotenone naturally occurs in the roots of tropical plants in the bean family (Leguminosae) in Mexico, Central and South America, Australia, Oceania and southern Asia. People in these areas have used rotenone for centuries to capture fish. Fisheries managers in North America began to use rotenone as a piscicide (fish killer) in the 1930s on lakes and ponds, and then in the 1960s on streams.

Rotenone works by inhibiting a biochemical process at the cellular level that inhibits fish to absorb oxygen in the blood. It provides rapid results and can be used in large river systems. The downside of rotenone is that it creates a temporary loss of potable water supplies and recreational opportunities, has a large effect on aquatic insects, can repel fish, and does not kill fish eggs until the shell ruptures at hatching.

Antimcyin

Antimycin is an antibiotic produced by molds of the genus Streptomyces that is found naturally in forest soils. It was first used as a piscicide in 1963, and is favored because it is not detected by fish and can be applied in cold alpine waters in parts per billion (ppb), which is one thousand times less than the amount needed for rotenone. Antimycin is a selective piscicide, meaning that it affects some fish more than others. It is frequently used to clean catfish ponds of unwanted fish, since catfish are very resistant to it.

Antimycin works by entering the fish gills and inhibiting fish to absorb oxygen at the cytochrome level, which takes longer than at the cellular level. The downside of antimycin is that it breaks down rapidly in the stream, so fisheries managers have to ensure that enough is present to be effective.

Fisheries Restoration in Great Basin National Park

In September 2000, Great Basin National Park in cooperation with the Nevada Division of Wildlife (NDOW) used rotenone to chemically renovate Strawberry Creek. Macroinvertebrate populations immediately plummeted following the treatment, and a year later populations had recovered to about 70% of pre-treatment numbers.

Due to concerns about rotenone's effects on macroinvertebrate populations, the amount of time rotenone takes to break down (weeks compared to hours for antimycin), and about safety (antimycin is safer to apply than rotenone), Park staff decided to use antimycin for the next treatment. Antimycin is the piscicide of choice for mountain streams in the National Park Service, used by Crater Lake, Rocky Mountain, and Great Smoky Mountains National Parks.

Prior to the Snake Creek treatment in August, the Park will sponsor a workshop in conjunction with the

American Fisheries Society to train fisheries managers in Nevada and Utah on how to use antimycin.

Great Basin National Park will monitor macroinvertebrates before and after the Snake Creek treatment to determine how fast aquatic insects repopulate the stream. We expect that the populations will rebound quickly, as they did at Great Smoky Mountains National Park, where macroinvertebrate numbers returned to pre-treatment levels only five months after an antimycin application.

The results with Snake Creek will be compared to those of Strawberry Creek to determine how macroinvertebrates rebound after applications of each chemical. Monitoring is also done to find out when the post-treatment macroinvertebrate population reaches 75% of the number and diversity of pre-treatment population. Once this goal has been obtained, then the food base should be sufficient to support a fish population, and Bonneville cutthroat trout will be reintroduced.

Is Anybody Out There?

by Bryan Hamilton

If you have ever sat outside on a damp spring evening and listened to a chorus of calling toads, watched tadpoles squirm through a muddy pool, or jumped back in alarm as a frog plops into a pond under your feet, you have experienced a part of the life cycle of an amphibian. Loud breeding choruses, aquatic tadpole stages, and dependence on water make frogs and toads some of the most easily noticed animals in nature. However in a desert like the Great Basin, amphibians, which are dependent upon water supplies, are difficult to find. Past surveys of amphibians within Great Basin National Park have been limited to stream surveys and opportunistic collecting. No amphibians have been documented, although seven species potentially occur. During 2002, Great Basin National Park will begin a complete census of all amphibian habitats within the park. Eight ponds and twelve watersheds will be surveyed to identify potential breeding habitat (ponds, lakes, low gradient springs and seeps). These habitats will be characterized based on their physical and chemical properties and targeted for sampling in 2003. Sampling during 2003 will focus on finding breeding frogs and toads. Breeding frogs and toads will be searched for using visual encounter and call surveys. All individuals observed will be identified, measured, photographed, and released. Amphibian inventories will be conducted by park staff under the direction of Mike Adams, U.S. Geologic Survey, Corvallis, Oregon. To further complicate a search for a semi-aquatic organism in one of the driest regions in the country, herpetologists throughout the world have noted numerous declines and malformations in amphibians. The causes of these declines and malformations are unknown, but may be related to disease, fungi, climate and habitat change, ultraviolet radiation, or a combination of these factors. Because of their porous skin and terrestrial and aquatic life cycle, amphibians are considered excellent indicators of environmental health, the proverbial "canary in the mineshaft." You can help Great Basin's Resource

Management staff with amphibian inventories by reporting any frogs or toads observed in the Park, Snake, or Spring Valleys to Bryan Hamilton at 234-7331 ext. 255. Feel free to call with any questions about your local amphibian fauna.

Researchers in the Park

by Kristina Heister

In 2001, sixteen researchers, from universities near and far, chose to investigate the natural resources of Great Basin National Park. Some of the questions that these researchers will help us answer are:

- What small mammals are present?
- What types of aquatic macroinvertebrates (stream insects) are present?
- How do truffles disperse and what types of truffles live here?
- What types of plants live here and where do they live?
- How does changing climate affect water efficiency in trees?
- How closely related are the marmots at Baker Creek to other marmot populations?
- Where in the park are there important geologic formations?

The natural resource staff is grateful to have the scientific community interested in park resources as they offer another avenue for obtaining valuable information that staff cannot collect. This partnership also moves us toward our goal of science-based natural resource management at Great Basin.

Many of the researchers here last year will be continuing their work in 2002. For example, John Van Hoesen, a geologist from University of Nevada, Las Vegas, discovered two new rock glaciers in the park last year, and this year he will return to try to establish whether they are still active (still ice underneath) or not. In addition to our folks from last year, we also have researchers conducting work on amphibians, reptiles, small and medium-sized mammals, fire history within subalpine habitats and more geology!

If you have questions on what research is going on in the park this summer, please contact our Scientific Collecting and Research Permit Coordinator, Gretchen Baker at 234-7331.

Watching Wildlife

by Neal Darby

Sage Grouse

A petition will soon be filed requesting that all sage grouse be listed as threatened under the Endangered Species Act. Two small populations in Washington and Colorado were recently listed as threatened. This new request covers the entire range of sage grouse, including most of Nevada. In an attempt to stay ahead of this petition and prevent the listing of sage grouse, Nevada's Govenor initiated the Sage Grouse Conservation Planning Team. This team directs and provides guidelines for county teams to devise sage grouse management plans. A White Pine County Planning Team, including representatives from state and federal agencies, sportsmen, environmental groups, county government and agricultural interests, has been convened to prepare a plan. Neal Darby, Park biologist, was selected chairman of the planning team. If you have any questions, you can contact him at 234-7331 ext. 232. All meetings are open to the public and will be held throughout the spring, summer and fall of 2002.

Rocky Mountain Bighorn Sheep

Resource Management (RM) staff will continue monitoring bighorn sheep this year. Winter counts so far this year have only found five sheep (four adults and one lamb) down from last August's count of nine sheep (six adults and three lambs). Objectives this year are:

1. To locate where the female bighorns have their lambs so we can manage these areas to prevent disturbance to the bighorns during this critical period. Searches involve hiking to vantage points and using binoculars and spotting scopes to view likely areas.

2. To conduct a classification count in late August or September where the sheep are known to congregate. Here we can obtain classification counts of rams, ewes and lambs and obtain age estimates of the rams. In conjunction with the U. S. Geologic Service Biological Resource Division, we received funding to undertake a complete assessment of the bighorn sheep.

3. To conduct helicopter surveys for other potential sheep and habitat use areas.

4. To ground truth the results of our GIS habitat model developed last year.

5. To convene a panel of experts to review the information we have on bighorn. These experts will visit the Park this summer and write a report providing management and research strategies that the Park could implement.

Elk

A unique opportunity has arisen to obtain better information on elk in the south Snake Range. In January of 2001, 50 elk were released by the Nevada Division of Wildlife in Horse Canyon, about 30 miles north of Baker. Ten of these were fitted with radio collars. One elk has joined the herd usually found in Weaver and Strawberry Creeks, which occasionally ventures into the Park. Resource management staff will use recently acquired telemetry equipment to track these elk. This provides the opportunity to determine detailed elk habitat and seasonal use areas, along with population counts.

Three-toed Woodpeckers

Three-toed woodpeckers are a spruce forest dependent species and are found around the northern hemisphere, including in the Snake Range.

The three-toed woodpecker is known to follow forest disturbances such as fire and insect outbreaks because they provide forage and snags for nesting. They are generally rare and difficult to detect in bird surveys.

In 2000 and 2001, Great Basin NP experienced two large fires, so it is possible that three-toed woodpeckers will move into the area. We will survey for three-toed woodpeckers in May and June to determine their continued presence and document reproduction. Information will help plan prescribed fire and prescribed natural fire management and insect outbreak management.