



Zion National Park Fire Management



Non-Native Plant Control Research in Zion Canyon

“Evaluate Treatments to Reduce Hazardous Fine Fuels Created by Non-Native Plants in Zion Canyon”

An innovative fire and resource management project has recently been initiated in Zion National Park. Zion Resource Management and Fire Management, through a partnership with the USGS Western Ecological Research Center and Lake Mead National Recreation Area Exotic Plant Management Team, have been funded by the Interagency Joint Fire Science Program to study ways to reduce non-native plants in Zion Canyon. The goal of the project is two-fold; to reduce the hazardous fuel bed created by non-native *Brome* grasses and to maintain the park’s biodiversity and native species. The study will include treatments of mowing, prescribed fire, herbicide application and sowing of native seeds.

The Problem

Non-native grasses are becoming an increasing problem throughout the Great Basin and southwestern areas of the United States. Cheatgrass (*Bromus tectorum*) and Ripgut Brome (*Bromus diandrus*) in particular, have invaded Zion Canyon to such a degree that historic warm season bunch grasses are out competed. This presents a problem for the park’s biodiversity and its mission of preserving and maintaining natural landscapes.

The annual, non-native grasses cure (die after setting seed) in the heat of June and leave behind extensive stands of dry and continuous fine fuel. Park managers are very concerned with the hazardous potential for wildland fire this creates in Zion Canyon. The fine fuel can ignite easily and transport fire rapidly from place to place due to the continuous and dense nature of these dried exotic grasses. In contrast, native bunch grass species are green into late summer and have a patchy distribution on the canyon floor, resulting in low fire spread potential.

Unfortunately, exotic *Bromus* grasses are very hard to control. Their seeds are distributed in the wind, and they successfully out-compete native plants in the sandy, poor soil that exists throughout the canyon. Adding to the challenge is the fact that they are well adapted to disturbed environments; which means they flourish after any ground disturbance.

Realistically, the park can't attempt to totally eradicate the invading grass species at this time. But past experiments have shown that selected areas in the canyon can be successfully managed. With this management technique, the park hopes to create natural fuel breaks in Zion Canyon with established native plants. These breaks will help to stop or slow a wildland fire.

What We Intend to Do

Park researchers have established a total of 140 monitoring plots (15m x 15m) in four locations in Zion Canyon, studying how to best eradicate the non-native grasses and establish native species in their place. Park visitors will be able to see a patchwork of plots from the road with a three-meter mowed buffer between each plot.

Varying management strategies will be tested on the plots, including:

- Prescribed fire, followed by herbicide application, in either the fall or spring, and seeding of natives.
- Mowing followed by herbicide application, in either the fall or spring, and seeding of natives.
- Prescribed fire followed by herbicide application, in either the fall or spring, without seeding of natives.
- Mowing followed by herbicide application, in either the fall or spring, without seeding of natives.
- Control plots (no treatment)

Herbicide is an important part of the treatments. It has been proven by five years of resource management experimentation to be the most effective and necessary tool to eradicating non-native grasses in Zion Canyon. Herbicide manufacturers are also involved with this project, designing chemicals which target only non-natives. They will also test application rates to determine their effectiveness.

To maintain the genetic integrity of our native plant populations, a variety of native seeds were collected from plants in Zion Canyon starting in 2003. These seeds will be sown into selected plots and then monitored over a period of years.

What We Hope to Learn

From the three-year study the park hopes to learn, which treatment, if any, is the most effective. Research findings will be distributed to other land use managers and scientists through a web site, fact sheets, seminars and publications. This study will be important in establishing a long-term management plan addressing non-native grasses and hazardous fine fuels in Zion Canyon and the region.