RM -CESU -Project Completion Report, FY 06

Project Title: Limber Pine and Mechanical Thinning Effects on Small Mammal Communities.

Park: BICA

Funding Source: Rocky Mountains CESU Research Funding; BICA funds

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Project Description:

Small mammals have critical roles in seed predation and dispersal, and are an important part of the food chain for coyotes, snakes, raptors and other animals. Rodent distributions are effected by the structure and species composition of the plant community, and in turn can affect the plant community. Plant communities at Bighorn Canyon have also been affected by long term human and livestock use, and current park management calls for doing mechanical thinning habitat improvement projects which will alter the structure of juniper habitat.

Blister rust in whitebark pine has been the subject of much concern and study in western parks and forests, and is responsible for substantial declines in whitebark pine. Rust effects on limber pine are much less well known. Before we devote resources to mapping limber pine and surveying for blister rust, we need to have a better idea of the role played by limber pine in the park environment.

Surveying small mammals at BICA was designed to answer 2 separate questions: Are small mammal communities in limber pine different from the surrounding juniper communities; and, what is the effect of mechanical thinning on small mammal communities?

Paired Sherman trap grids were set in the habitat of interest (limber pine or thinned area) and in a neighboring control area. Grids were checked in the early morning, and all captured rodents were identified, weighed, and sexed before release at the capture site. 6 pairs (control and treatment/ limber pine) of sites were sampled (3 limber pine and 3 mechanical thinning). 100 traps were set at each site for 3 consecutive nights. Because the majority of the captures were *Peromyscus*, and hantavirus is a concern, personal protective equipment including a respirator were used by all people handling rodents. All data was entered into a database, sites GPSed and metadata collected and stored.

Project Results:

At the scale sampled, neither mechanical thinning nor the presence of limber pine had significant effects on the small mammal community. Sample sizes were lower then anticipated (Total of 207 captures in 3,600 trap nights). This rate of 5.7 captures/100 trap nights is lower than the average across all habitats of 17.2 captures/100 trap nights recorded in 2003/2004. Similar methods were used in each sampling event, and the reason for the difference in capture rate is unknown. Individual animals were not marked, so a single animal could have been captured more then once on succeeding days.

Limber Pine: Three plot pairs were sampled. In the limber pine plots 54 deer mice (*Peromyscus* spp) and 5 kangaroo rat (*Dipodomys ordii*) captures were recorded. In the neighboring control plots 39 deer mouse, 3 kangaroo rat, 4 least chipmunk (*Tamais minimus*), and 4 wood rat (*Neotoma cinereal*) captures were recorded.

Mechanical Thinning: Three plot pairs were sampled. In the thinned plots 39 deer mouse, 14 kangaroo rat, and one desert cottontail (*Sylvilagus audobonii*) captures were recorded. In the neighboring control plots, 37 deer mice, 5 kangaroo rat and 1 least chipmunk capture were recorded.

Due to low capture rates and small sample sizes, no meaningful statistics could be calculated. Sites were small and edge effect probably also played a role. This study does not rule out the possibility of a limber pine or mechanical thinning effect, but it suggests that such an effect may not be of a large magnitude.

Because some Sherman traps were borrowed from SAMO, and one of the students accepted another job early in the summer, $2823.78 was returned to the CESU.

Follow-up of this Project

This project suggests the need for a larger scale study to increase confidence in the results. Mechanical thinning of juniper stands will continue. Its effect on small mammal populations may need to be re-evaluated at a future data, but current results suggest no reason for alteration of thinning plans. Limber pine will continue to be observed for signs of rust, but no large scale mapping or survey effort will occur in the immediate future.