

# **Project Completion Report**

## **Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)**

**Project Title:** Biotic Diversity of Aspen Stands in RMNP: Effects of Browsing Enclosures

**Project Code (such as UMT-72 and/or the “J” or “P” number):** P12AC10484 UNC-14 ROMO

**Type of Project (Research, Technical Assistance or Education):** Research & Education

**Funding Agency:** National Park Service

**Partner University:** University of Northern Colorado

**NPS Agreement Technical Representative (with complete contact information):**

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**Start Date of Project:** 5/1/2012

**End Date of Project:** 12/30/2013

**Funding Amount:** \$2134.00

**Project Summary**, See ‘Lessons Learned’ below for a summary and the following website (<http://www.unco.edu/nhs/biology/sfranklin/research.html>; click on the aspen enclosure biodiversity picture) for the full final report.

**Number of students participating in this project:** 28 undergraduates, ten graduate students, 0 degrees conferred.

### **Lessons Learned from this project:**

#### **Biodiversity Aspect**

In general, the data do not support our hypothesis that enclosed aspen stands would have higher biodiversity than control stands, but there are two reasons for further study. First, the data were collected only three years following the building of the enclosures and clearly our data as well as Gage and Cooper (2008) showed such enclosures affect large animal movement. Second, short-term impacts have been seen at other enclosures studies (Kleintjes Neff et al. 2007), and our results (trend toward higher diversity in aspen enclosures) support their results.

Two trends are clear from the data. First, there was a noticeable alteration to the vertical structure of vegetation and such changes in structure are known to have cascading effects on other trophic levels (Kleintjes Neff et al. 2007). Second, soil chemistry is very different between enclosed and control sites, especially those enclosures that are 50 years old. This result alone supports a functional change to these stands when released from heavy browsing pressure. While impacts on richness were not yet clear, there is certainly reason to believe biodiversity may be affected in a longer time frame.

#### Citizen Science Aspect

Base on the general take-home messages, students' data seemed to suggest the same trends as PI-collected data, so that seems a positive result for citizen science. Such a result suggests citizens can be trained in a short period of time for morphospecies monitoring and that data would be useful. While PI-collected and student-collected data are not directly comparable due to time differences, student-collected data generally underestimated biodiversity as has been shown in other studies (Derraik et al. 2010), mainly due to a lack of identification skills and not necessarily a lack of 'seeing' individuals. One particular component is bird calls that are extremely difficult to teach to a novice.

#### **Other RM-CESU agencies or research partners who participated in this project:**

None.