

**Project Summary**  
**Rocky Mountains Cooperative Ecosystem Studies Unit**

**Project Title:** Western National Parks Federal Highways Vegetation Monitoring

**Discipline:** Natural  
**Type of Project:** Technical Assistance  
**Funding Agency:** National Park Service  
**Cooperators:** Colorado State University  
**Effective Dates:** 6/5/2014 - 5/31/2016  
**Funding Amount:** \$97,630

**Investigators and Agency Representatives:**

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**Project Abstract:**

*Extensive Monitoring Study*

- Analyze the data collected from the Badlands National Park, Canyon de Chelly National Monument, Capital Reef National Park, Golden Gate National Recreation Area, Grand Teton National Park, Mesa Verde National Park, and Yellowstone National Park using the following methods:
  - Data will first be summarized and analyzed park by park.
  - If appropriate, the data from all four parks will be analyzed together to assess similarities and differences among parks.
  - Use of analytical methods such as analysis of variance and ordination techniques will be considered.
- Recommend improvements to existing NPS-DSC-T vegetation restoration effectiveness monitoring protocols.
- Identify successful and unsuccessful species for revegetation for FLHP projects in the targeted National Parks at park and western regional scales.

*Intensive Experimental Study*

- Evaluate which combination of soil treatments best promotes the establishment and growth of seeded and resident native species without promoting invasive species establishment and growth.
- Assess the relative roles of soil water and nitrogen availability in establishment and growth of seeded and resident native species and resident exotic species.
- Conduct a partnered greenhouse study that simulates field conditions to determine how soil treatments affect germination, establishment and competition of *Elymus elymoides* alone and in competition with *Bromus tectorum* and *Elymus canadensis* alone and in competition with *Bromus inermis*.

**Outcomes with Completion Dates:**

Draft Reports due: August 31, 2014 and 2015  
Final Report due: October 31, 2014 and 2015

**Keywords:** revegetation, native plants, monitoring, roadside vegetation, Colorado State University