

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

**Project Title:** Develop & Implement Vegetation Restoration Effectiveness Monitoring Program

**Discipline:** Natural  
**Type of Project:** Technical Assistance  
**Funding Agency:** National Park Service  
**Other Partners/Cooperators:** Colorado State University  
**Effective Dates:** 5/3/2010 - 9/30/2013  
**Funding Amount:** \$39,659

**Investigators and Agency Representative:**

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**Project Abstract:** Disturbed ground is being created by the pine bark beetle infestation in visitor use areas on the east and west sides of Rocky Mountain National Park (RMNP). The park's restoration plan requires that revegetation of park lands utilize germplasm from within park boundaries to maintain the genetic resources within the park. RMNP does not have the available space or professional expertise required to restore these areas, and must rely on a CSU experts to assist with the propagation of trees and shrubs to be used in the restoration.

The nursery at CSU- CSFS serves as a regular "hands-on" educational experience to university students involved in ecological restoration, plant propagation techniques, forestry and horticulture programs in general. The nursery unit regularly employees university students in both their academic pursuits and in providing needed income. In addition to Colorado State University the nursery works regularly with Front Range Community College to educate college students on restoration and plant propagation. The nursery site and propagation facilities regularly facilitate academic research in entomological and ecological studies. Public outreach is another regular program activity of the CSFS (especially through its extension website) and its nursery to educate the public in the importance of conservation and restoration of the Colorado environment. Homeowners on the Front Range of Colorado will benefit from these propagation techniques to restore both public and private lands to native species.

**Description of Work:** To further site restoration for beetle plagued areas, the investigators from CSU will propagate trees and shrubs as shown in the scope of work Tables 1 and 2. Plants propagated with seed collected from the Westside of RMNP must be kept separate from plants propagated for the Eastside of RMNP. The park staff will work with the cooperator to determine and propagate the correct type of plants, ones that are genetically appropriate, and of excellent quality and health. Final completion report will be submitted to the park and RM-CESU.

**Table 1) Westside Species**

Scientific Name	Common Name	Totals by Species
<b>Tree spp.</b>	<b>Tree spp.</b>	<b>Tree spp.</b>
<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	2433
	Colorado Blue Spruce	695
	Engelmann Spruce	695
	Subalpine Fir	695
<b>Shrub spp.</b>	<b>Shrub spp.</b>	<b>Shrub spp.</b>
<i>Potentilla fruticosa</i>	Shrubby Cinquefoil	2434
	<b>Westside Total =</b>	<b>6,952</b>

**Table 2) Eastside Species**

Scientific Name	Common Name	Totals by Species
<b>Tree spp.</b>	<b>Tree spp.</b>	<b>Tree spp.</b>

<i>Pinus contorta</i> var. <i>latifolia</i>	Lodgepole Pine	4158
<i>Pinus flexilis</i>	Limber Pine	1305
<i>Pinus ponderosa</i> ssp. <i>scopulorum</i>	Ponderosa Pine	3951
<i>Picea pungens</i>	Colorado Blue Spruce	602
<i>Picea engelmannii</i>	Engelmann Spruce	602
<i>Pseudotsuga menziesii</i>	Douglas-Fir	602
<i>Sabina scopulorum</i>	Rocky Mountain Juniper	602
<b>Shrub spp.</b>	<b>Shrub spp.</b>	<b>Shrub spp.</b>
<i>Purshia tridentata</i>	Antelope Bitterbrush	2307
<i>Ribes cereum</i>	Wax Currant	1437
<i>Artemisia tridentata</i> ssp. <i>vaseyana</i>	Mountain Sagebrush	834
<i>Arctostaphylos uva-ursi</i> ssp. <i>adenotricha</i>	Kinnikinnick	1031
<i>Rosa woodsii</i>	Woods' Rose	617
	<b>Eastside Total =</b>	<b>18,048</b>

**Outcomes with Completion Dates:** June 1, 2013

**Keywords:** Vegetation, restoration, monitoring plan, Colorado State University State Forest Service Nursery, Rocky Mountain National Park