

## PROGRESS REPORT FOR FY03 RM-CESU PROJECT

**Cooperative Agreement Number:** CA-1200-99-07

**Park:** Rocky Mountain National Park

**Project Title:** How Selective are Biological Controls: Testing non-target herbivory by biological control agents for yellow toadflax (*Linaria vulgaris*) and Dalmatian toadflax (*Linaria genistifolia* spp. *Dalmatica*)

**Principal Investigator:** Dr. Tim Seastedt

Professor, Ecology & Evolutionary Biology  
INSTAAR, CB 450  
University of Colorado  
Boulder, CO 80309-0405  
Phone: (303) 492-3302 Fax: (303) 492-6388  
Timothy.Seastedt@colorado.edu

### Work Accomplished in FY03:

A field study site on private land in Left Hand Canyon, Boulder County, CO was established. This site is characterized by both infestations of Dalmatian toadflax (*Linaria genistifolia* spp. *Dalmatica*) and yellow toadflax (*Linaria vulgaris*), as well as abundant, naturally occurring population of several species of *Penstemon*. Two hundred of biological control stem-boring weevils, *Mecinus janthinus*, were released on two infestations of Dalmatian toadflax in June 2003. One of the Dalmatian toadflax biocontrol release sites had co-occurring *Penstemon* spp. and one did not. Three other populations of *Penstemon* spp., not in close proximity to the Dalmatian toadflax biocontrol sites, were established. In late August, *Penstemon* spp. stems were harvested at all five locations. Stems were evaluated for evidence of oviposition and herbivory by *Mecinus janthinus*. Seedhead and seed production of the *Penstemon* spp. was also quantified. In October 2003, the study site burned during a wildfire.

A second site on "East Campus" in Boulder was also established. One hundred weevils were released on Dalmatian toadflax near a local population of *Penstemon* spp. In July and September, three species of *Penstemon* and one species of *Castelleja* were salvaged from along Bear Lake Road in Rocky Mountain National Park. A total of 119 plants were salvaged from the park. Seeds of the native plant blue toadflax, *Linaria canadensis* var. *texana*, were obtained from Boulder Open Space and Mountain Parks and are currently being propagated for use in later testing.

### Plants Salvaged from Rocky Mountain National Park FY03

<i>Date Salvaged</i>	<i>Location</i>	<i>Species</i>	<i>Number Salvaged</i>
07/05/2003	BLR – 18+820	<i>Penstemon virens</i>	35
07/05/2003	BLR – 18+820	<i>Penstemon virgatus</i>	35
09/17/2003	BLR – 17+000	<i>Castelleja</i> sp.	15
09/17/2003	BLR – 15+700	<i>Penstemon secundiflorus</i>	34
<b>Totals:</b>		<b>4 species</b>	<b>119</b>

**Planned Research:**

In light of the fact that the Left Hand Canyon field site burned in the fall of 2003, a need for more accelerated observation of behavior of *Mecinus janthinus* on native species in the Scrophulariaceae family exists. During the 2004 field season, the weevil will be put in enclosures with *Penstemon* alone, and *Penstemon* plus Dalmatian toadflax. Further testing of the weevil against the native toadflax, *Linaria canadensis var. texana*, will also take place. In addition, a site has been located in Jefferson County, CO where *Mecinus janthinus* was released on Dalmatian toadflax in 2001. This site also has co-occurring *Penstemon spp.* We plan to observe the established population *Mecinus janthinus* relative to the native *Penstemon*.

**Budget:**

Project total cost to NPS = NTE \$6,458.00

ITEM	PROPOSED	FUNDS SPENT	FUNDS REMAINING
<b><i>Salaries &amp; Benefits:</i></b>	<b>\$4,308</b>	<b>\$3294</b>	
Principal Investigator (100% time x .25 mo) = (\$2,808)			
Student Hourly (\$10/hr x 150 hrs) = (\$1,500)			
<b><i>Total Travel</i></b>	<b>\$ 915</b>		
<b><i>Total Other Direct Costs</i></b>	<b>\$ 393</b>		
INSTAAR Accountant (\$393)			
<b>TOTAL COSTS</b>	<b>\$5,616</b>	<b>\$3294</b>	<b>\$2752</b>
<b><i>Indirect Costs</i></b>	<b>\$ 842</b>		<b>\$ 412</b>
Of Campus: 15% of MTDC (\$842)			
<b>TOTALS:</b>	<b>\$6,458</b>	<b>\$3294</b>	<b>\$3164</b>

**Photos:**



Hillside with Dalmatian toadflax at study site, Left Hand Canyon, Boulder County, CO  
(photo by N. Breiter)



*Mecinus janthinus* on Dalmatian toadflax in Jefferson County, CO  
(photo by N. Breiter)