

RARE

Washington Rare Plant Care & Conservation ♦ University of Washington Botanic Gardens
3501 NE 41st Street, Box 354115, Seattle, WA 98195-4115 USA ♦ 206 616-0780
<http://depts.washington.edu/rarecare> ♦ rarecare@u.washington.edu

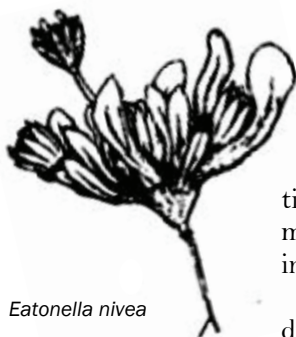
Spring/Summer
2010
Vol V No 1

PLANT



Rare Care staff
Sarah Reichard, Ph.D.,
Director
Wendy Gibble,
Program Manager
Jennifer Youngman,
Program Assistant
Ellen Kuhlmann,
Seeds of Success
Project Manager

Science Advisory Board
Joe Arnett
Peter Dunwiddie, Ph.D.
John Gamon
Art Kruckeberg, Ph.D.
Regina Rochefort, Ph.D.
Ted Thomas



Eatonella nivea



School of Forest Resources
College of the Environment

R E S S

Rare Care values its volunteers across the state. . .and beyond

Recent volunteer forums in White Salmon, Spokane, Wenatchee and Seattle gave Rare Care staff the opportunity to thank volunteers and recognize two in particular for outstanding contributions: Paul Slichter of Gresham, Oregon, and Betty Swift of Seattle, Washington.

Alone or with field partners, Slichter monitored 20 rare plant populations, 15 of which were new sightings. He visited public lands owned by 7 different agencies, observed 14 rare species, submitted outstanding photographs and logged 234 volunteer hours.

For several years Swift has traveled to far reaches of the state to monitor and

collect seed. In the past two years alone she monitored 8 species, collected seed from 2 species, recruited, mentored and partnered with other volunteers, and participated in special projects. She reported 125 hours in 2009. Now Swift and Slichter have begun again for 2010!

In 2010, Rare Care is eager to strengthen its activity in the Methow Valley. Program Manager Wendy Gibble will present to the Methow Conservancy May 4, and she's forming plans to offer monitoring training in the Methow and in Wenatchee early in June. Please spread the word and contact rarecare@uw.edu if interested.

Houndstongue biocontrol agent—a risk to native borages?

A biocontrol agent (a natural enemy of a weed occurring in the weed's native habitat) of the noxious weed houndstongue (*Cynoglossum officinale*) appears to have made its way into Washington State from neighboring British Columbia. There is some concern that this biocontrol agent, a root weevil called *Mogulones cruciger*, may attack other members of the borage family, most notably the endangered showy stickseed (*Hackelia venusta*).

BC Ministry of Forests released nearly 50,000 weevils between 1997 and 2002 at multiple locations in the Thompson Okanagan region. The weevil feeds on the leaves of houndstongue, making distinctive round holes. Females oviposit their eggs in a cavity in the leaf petiole or shoot near the base of the plant, preferentially selecting basal leaves of large reproductive plants. Once the larvae emerge, they make their way down to the roots and consume them, significantly weakening or killing the host plant.

Prior to releasing the biocontrol agent in Canada, preliminary testing was conducted to determine whether *M. cruciger* would attack other members of the borage family, such as confamilial species in the genera *Amsinckia*, *Cynoglossum* and *Lappula*. Since the weevil showed strong host specificity to houndstongue in the initial testing, it was recommended for release in Canada and the United States. However, the US Fish and Wildlife Service denied regulatory approval for release in the US, because it considered the testing inadequate to determine whether the weevil would attack non-target native borages listed under the Endangered Species Act.

In 1998 and 1999, a follow-up study looked at a wider suite of borages, including 12 native *Cryptantha*, one native *Hackelia*, two native *Cynoglossum* and two native *Plagiobothrys* species (De Clerck-Floate and Schwarzländer 2002). In this study, potted plants were exposed to *M. cruciger* either at a field release site or in a garden or greenhouse setting. Nine of the 22 species tested supported full development of *M. cruciger*, although when given a choice, the weevil preferred houndstongue. Only two species, *Hackelia floribunda* and *Cryptantha celosioides*, were attacked in the open field experiments when they were growing with houndstongue, but the number of plants attacked was low (10 and 7% respectively).

(continued on page 2)



Above, houndstongue plants exhibit larval root mining damage by *Mogulones cruciger*. Right, the adult weevil has a distinctive white cross on its back. Images courtesy of University of Idaho.



Please inspect houndstongue plants for weevils

Please be on the lookout and inspect all houndstongue plants for *Mogulones cruciger*. Report sightings (location, date, evidence) to rarecare@uw.edu or US Fish and Wildlife Biologist Tim McCracken (Timothy.McCracken@fws.gov).

Despite their distinctive white cross, adults can be hard to spot. They drop and hide in the soil when they spot movement. Look for small round holes on petioles of leaf blades from feeding adults, or small dark green “blistered” egg cavities. Other insects cause similar leaf damage but primarily on leaf blades. Also look for stunted and twisted plants with chlorotic (yellowing) leaves. Adults are most active on warm spring days. In late spring and summer they will not be abundant, but significant larval presence in houndstongue roots is likely.

Impact unknown, so monitoring weevil’s presence is vital

(continued from page 1)

Another study evaluated attacks of *M. cruciger* on four native borage species at sites in Canada (Andreas et. al. 2008). Sites were selected based on where the weevil was known to have persisted for two years or more and where the houndstongue population was small and therefore the weevil was likely experiencing resource limitations. Attack rates and intensity were compared between houndstongue and a confamilial species growing within a 10-meter radius of the host plant. The researchers found that *M. cruciger* attacked all four native borages occurring at one or more of the study sites to some degree, but the degree varied by site and by year and was consistently less than on houndstongue. However, there was a positive correlation between the likelihood of a non-target plant species being attacked and the abundance of *M. cruciger* on houndstongue.

What does this mean for rare native borages? First, it is difficult to predict which native species the weevil will attack, as studies have not shown consistent patterns based on genus, life history traits or plant size. Second, it appears that the weevil will preferentially select houndstongue when it is present, but it is unknown to what extent the weevil will attack native borages at sites without houndstongue.

Rare native borages that occupy similar habitat as houndstongue and *M. cruciger* are the species we should be most concerned about. Houndstongue is found primarily east of the Cascade crest and prefers disturbed areas and roadsides; however, it appears to have broad ecological tolerance. It is notably abundant in Douglas-fir and ponderosa pine forests but also occurs in grasslands, shrublands and even sand dunes. *M. cruciger* is native to most areas in Europe as well as northern Africa. It occupies a variety of habitats in its countries of origin, ranging from moist forests to dry disturbed areas. Based on this information, it appears that the federally listed *Hackelia venusta*, which inhabits open Douglas-fir and ponderosa pine forests in Chelan County, is well within the range of houndstongue and its biocontrol agent and could be vulnerable to an attack, but we cannot rule out potential impacts to other rare *Hackelias* and *Cryptanthas* native to our state.

Finally, it is unknown what impact an attack of *M. cruciger* will have on natural populations of rare borages and whether the attack will persist over time or be short-lived. Given all these uncertainties, it is vital that we monitor the spread and occurrence of *M. cruciger* in Washington and control and remove houndstongue in areas where rare native borages occur.

Andreas, J.E., M. Schwarzländer, and R. De Clerck-Floate. 2008. The occurrence and potential relevance of post-release, nontarget attack by *Mogulones cruciger*, a biocontrol agent for *Cynoglossum officinale* in Canada. *Biological Control* 46: 304-311.

British Columbia Ministry of Forests and Range Biocontrol Development Program “Biological Control Agent: *Mogulones cruciger* (Herbst)” website. Accessed March 29, 2010. <http://www.for.gov.bc.ca/HFP/biocontrol/>

De Clerck-Floate, R. and M. Schwarzländer. 2002. Host specificity of *Mogulones cruciger* (Coleoptera: Curculionidae), a biocontrol agent for houndstongue (*Cynoglossum officinale*), with emphasis on testing of native North American Boraginaceae. *Biocontrol Science and Technology* 12: 293-306.

Rare Care assists state and federal agencies

Rare Care’s 2010 field season includes new opportunities to assist state and federal agencies with various rare plant monitoring projects. In early March, several volunteers joined DNR staff in Klickitat County to collect population data from permanent sampling plots of Dalles Mountain buttercup (*Ranunculus triter-natus*). Similar efforts will be undertaken in May when Rare Care volunteers collect data on golden paintbrush (*Castilleja levisecta*) in Thurston County and Whited’s milk-vetch (*Astraglus sinuatus*) in Chelan County.

Starting in August, Spokane area volunteer monitors will conduct surveys at Turnbull National Wildlife Refuge for Spalding’s catchfly (*Silene spaldingii*), a federally listed threatened species. We anticipate this project will last several field seasons in order to adequately cover areas with suitable habitat for the catchfly.

Rare Care is grateful for support from the Miller Charitable Foundation, Bullitt Foundation, Hugh and Jane Ferguson Foundation, Deupree Family Foundation, Seattle Garden Club, Tacoma Garden Club, Washington Native Plant Society, private organizations and individual donors.