

The Sweep Net

January 2011

A newsletter to keep you up-to-date on pollinator and beneficial insect activities at the Pullman Plant Materials Center, the Washington NRCS State Office and beyond.



A small moth visiting a snow buckwheat (*Eriogonum niveum*) bush at the Othello Experiment Station. Pamela Pavek

New Pollinator Technical Note Available

The Washington Revised Biology Technical Note 24: Plants for Pollinators in the Inland Northwest is now available through eFOTG. This Technical Note provides guidance for the design and implementation of conservation plantings to enhance pollinator habitat in eastern Washington, northeastern Oregon and northern Idaho. The document will also soon be available in Idaho as Plant Materials Technical Note 2B and in Oregon as Plant Materials Tech Note 41.

If you are designing pollinator habitat in western Washington or western Oregon, refer to the Oregon Plant Materials Tech Note 13, Plants for Pollinators in Oregon. If you are in southern Idaho, southeastern Oregon, northern Nevada or northern Utah, refer to the Idaho Plant Materials Tech Note 2A, Plants for Pollinators in the Intermountain West.

Did you know...

a study was recently published by the National Academy of Sciences that documents a severe decline of North American bumble bee species over the last 20 to 30 years? The study compared historical collection records with current field surveys for eight species, and found up to 96% reduction in the

relative abundance of four species and a 23 to 87% contraction of their surveyed geographic ranges. Among the declining populations, they found significantly higher infection levels of the microsporidian pathogen *Nosema bombi* and lower genetic diversity compared to non-declining populations of co-occurring species. One of the four declining bumble bee species is found in the western U.S.: *Bombus occidentalis*, as are two of the four stable species: *B. bifarius* and *B. vosnesenskii*. The lead author of the study is Sydney A. Cameron at the University of Illinois. Other authors include James R. Strange and Terry L. Griswold, both with the ARS Pollinating Insects Research Unit in Logan, Utah. The study can be accessed at:

<http://www.pnas.org/content/early/2011/01/03/1014743108.full.pdf+html>



Bombus occidentalis. Derrick Ditchburn, www.xerces.org



Bombus bifarius. Diane Wilson, www.discoverlife.org



Bombus vosnesenskii. Tom Murray, www.discoverlife.org

Conservation of Ground Beetles

Contributed by Timothy D. Hatten¹

Ground beetles of the family Carabidae are abundant, species rich, and generally beneficial in a diverse assortment of crops throughout the USA and world. However, because they live on the soil surface as adults and within the soil as juveniles, ground beetles often go unnoticed. If you do happen to spot one, it will probably be running for cover, range in size from 2mm to 30mm, and be black, brown or metallic in coloration.

Ground beetles are beneficial because they are predatory and have a preference for slow moving pests including slugs, snails, wireworms, weevils, root flies, aphids and more. Some ground beetles are seed feeders, but if they are, they tend to prefer seed from broadleaf plants which are often weed species. Ground beetles are also valued as an important food source for many birds including game species such as pheasants and grouse, and they contribute to faunal biodiversity within and outside of agroecosystems.

Because ground beetles inhabit the soil environment and live much of their lives within crop fields, they are vulnerable to soil tillage. On the Palouse, for example, research indicates that the number

of ground beetle species is lower in conventional-tillage- than in conservation-tillage wheat fields, corroborating the findings of researchers from many regions. By reducing the number and intensity of soil cultivations, conservation-tillage systems maintain the soil environment and a layer of crop residue on the soil surface. Such residue benefits ground beetles by providing protection, moderate soil temperature and moisture levels, and enhanced food resources via an enriched fungal-based food web. Moreover, less tillage means that fewer beetles will be plowed under or killed during cultivation.

Ground beetle populations are enhanced by soil organic matter and those soil amendments and practices that enrich soil. Not surprisingly, then, ground beetle abundance and richness is frequently higher in organic and/ or biointensive farming systems than in conventional systems. This relationship is affected not only by soil quality but also by pesticide regime, with fewer or softer pesticides applied in nonconventional farming systems. Like most natural enemies of pest species, ground beetles are vulnerable to broad spectrum pesticides. Hence, use of alternative pest management practices or biorational pesticides can help to conserve these valuable beetles.

And lastly, diversification of habitat within and adjacent to crop fields may benefit ground beetles. Hedge rows and roadside plantings have been shown to provide important refugia for ground beetle assemblages especially during the winter period. Undersown or understory crops within fields have also been demonstrated to benefit ground beetle populations. Indeed, even volunteer, weedy species can help to conserve ground beetles within fields by altering microclimate and providing refugia and food.

In conclusion, ground beetles are a beneficial group of predatory beetles, and while sensitive to agricultural intensification, they respond to conservation-oriented management practices within agroecosystems. In many respects, the same management practices that conserve soil, water and beneficial insects such as pollinators, help to conserve this important group of shy but abundant beetles.

¹ Timothy D. Hatten has a Ph.D. in entomology and is the founder of Invertebrate Ecology Inc.



Poecilus lucublandus is commonly found in cropland and native habitat throughout much of the USA. www.bugguide.net

Washington and Idaho Will Host Xerces Society Pollinator Conservation Planning Short Courses in 2011

Contributed by Eric Mader, Xerces Society

The current Farm Bill makes pollinators a conservation priority for the NRCS and numerous efforts are already underway to help address their ongoing decline. To support this work, the Portland-based Xerces Society for Invertebrate Conservation is working with the agency to bring the Pollinator Conservation Short Course to Idaho, and three locations in Washington during 2011.

This day-long Short Course, which has already been conducted in dozens of other locations nationwide, will provide agency staff and partners with the latest science-based approaches to increasing crop security and reversing the trend of pollinator decline, especially in heavily managed farm landscapes.

Introductory topics include the basic principles of pollinator biology, the economics of insect pollination, recognizing native bee species, and assessment of pollinator habitat.

Advanced modules will cover farm management practices for pollinator protection, the development of pollinator habitat enhancements, incorporating pollinator conservation into NRCS programs, selection of plants for pollinator enhancement sites, management of natural and urban landscapes, and the additional funding sources and technical support available to land managers.

Throughout the workshop these training modules are illustrated by real case studies of pollinator conservation efforts across the country.

Exact dates and locations are still being determined, but tentative plans are to offer the Short Courses in June and July, with the events in southern Idaho and in Washington targeting the Puget Sound, Wenatchee, and Pullman areas. Participants will receive the Xerces Society's Pollinator Conservation Toolkit which includes published farm and habitat management guidelines, fact sheets and nest construction plans, relevant Extension and NRCS publications.

The Pollinator Conservation Planning Short Course is made possible with funding from the USDA's Sustainable Agriculture Research and Education (SARE) program, and by the NRCS West National Technology Support Center.

Additional date, location, and registration information will be announced in The Sweep Net when it becomes available.

For more information, please contact Eric Mader, the Xerces Society's Assistant Pollinator Program Director at 503-232-6639 or eric@xerces.org.

Featured Pollinator Plant

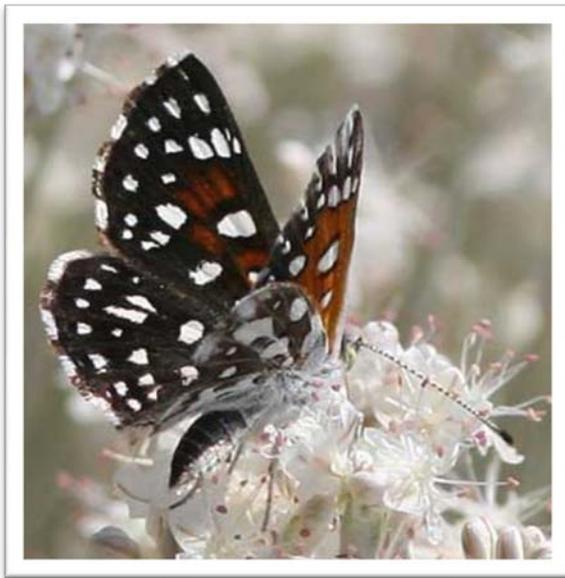
Snow buckwheat (*Eriogonum niveum*) grows on harsh, rocky sites throughout Idaho, Oregon, Washington and British Columbia. It is one of the latest plants to bloom in the growing season, blooming late August through early October. The plant provides nectar and pollen for a variety of insects. During one instance on September 15 at the Othello, WA Experiment Station last year, 5 species of bees, 5 species of wasps, 2 species of flies and 2 species of moths were observed visiting the *Eriogonum niveum* plants. For more information about snow buckwheat, see the Plant Guide available on the NRCS PLANTS website:

<http://www.plants.usda.gov/java/nameSearch?keywordquery=eriogonum+niveum&mode=sciname> and an eastern Washington naturalist's website: <http://www.bentler.us/eastern-washington/plants/buckwheat/snow-buckwheat.aspx>



Snow buckwheat. Clayton J. Antieau

Featured Pollinator



Mormon metalmark butterfly (*Apodemia mormo*) extracting nectar from a snow buckwheat flower. Fred Bentler

The **Mormon metalmark butterfly (*Apodemia mormo*)** flies in the late summer months when snow buckwheat, other buckwheat species and rubber rabbitbrush are in bloom. The butterfly relies on these plants for sources of nectar. The Mormon metalmark also utilizes snow buckwheat as a host plant; the butterflies lay lavender-colored eggs on the stems and leaves of the plant, where they overwinter and hatch the following spring. Mormon metalmarks are listed as rare and threatened in Canada due to declining habitat. For more information see Fred Bentler's website: <http://www.bentler.us/eastern-washington/animals/insects/butterflies/mormon-metalmark-butterfly.aspx> and the Discover Life website: <http://www.discoverlife.org/20/q>



On the day we observed snow buckwheat buzzing with pollinator activity, we also found this praying mantis waiting for its next easy meal. Pamela Pavek

Who We Are

The Pullman Plant Materials Center is one of 27 Plant Materials Centers throughout the country which have the responsibility of developing plant materials and technology for establishing and managing plants used in resource conservation efforts. The Pullman Plant Materials Center was established in 1935 and services the Inland Northwest region, including eastern Washington, eastern Oregon and northern Idaho. For more information, please visit our [website](http://plant-materials.nrcs.usda.gov/wapmc/index.html):

<http://plant-materials.nrcs.usda.gov/wapmc/index.html>

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