August, 2015

Issue 10

MONARCH JOINT VENTURE

MonarchNet News
A Citizen Science Newsletter

Upcoming Events

- Monarch Festival, Minneapolis, MN, Sept 12, 10am-4pm.
- Monarch Watch Fall Open House, Lawrence, KS, Sept 12, 8am-2pm
- Texas Pollinator Powwow, Kerrville, TX, Sept 19-20

Monarch seeds. Photo: Denny Brooks.

The Monarch Joint Venture
2003 Upper Buford Circle
135 Skok Hall
St. Paul, MN 55108

Phone: (612) 625-8304
Fax: (612) 625-5299
monarchs@monarchjointventure.org
www.monarchjointventure.org/

Citizen Science Updates

Monarch Health Funding Campaign Underway

- Monarch Health, a citizen science project that tracks the presence of the protozoan parasite OE (*Ophryocystis elektroscirrha*) in monarch butterflies, is more than halfway through their summer funding campaign to support the continuation of their project. You can make a donation through September 5th by visiting their crowdfunding website. To learn more about Monarch Health, visit their new website at monarchparasites.org or find them on Facebook at https://www.facebook.com/ProjectMonarchHealth.

Australian Citizen Science Conference

- The newly formed Australian Citizen Science Association held their first Citizen Science Conference in the end of July in Canberra. The event was a huge success, with attendees from across Australia and other countries coming together to discuss the creation, management, challenges, and successes of citizen science projects. You can learn more about the Australian Citizen Science Association here.

Monarch SOS App Rollout

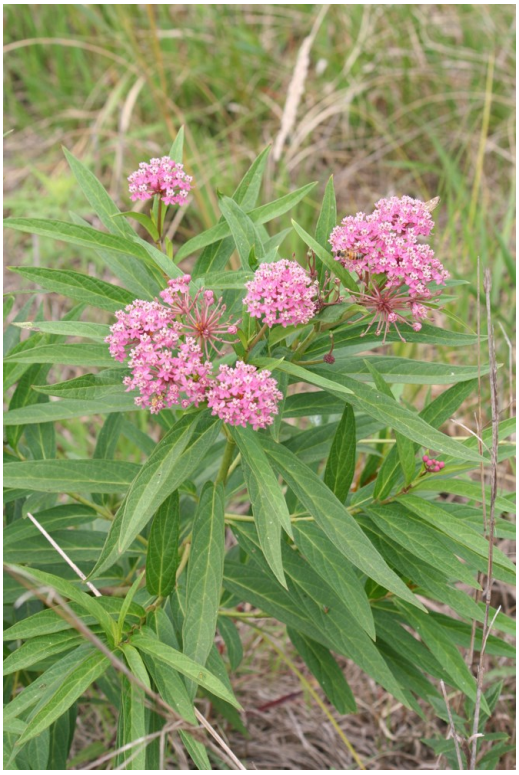
- The Monarch Joint Venture and its partners are excited to be working with developers at NatureDigger to create a monarch citizen science app. Right now the app, Monarch SOS, is a companion guide that can be used to help identify monarchs in all life stages, as well as many commonly found milkweed species. In the future, it will provide a way to record and report data to multiple citizen science projects directly while out in the field! You can find the app by searching "Monarch SOS" on the Apple Store or following this link (currently only the Apple version is available). If you have feedback on the app, what you would like to see from the next phase of development, and how Monarch SOS can be most useful to you, please email monarchs@monarchjointventure.org.

New book on Butterfly Conservation to be Published in September

- A new book entitled *Butterfly Conservation in North America: Efforts to help save our charismatic microfauna* will be released on September 14. The book, which contains scholarly chapters on protecting butterflies throughout the continent, describes ways in which monitoring and citizen science projects can play a role in conservation. You can read more about the book here.

What Can You Do in a Milkweed Patch?

Many people immediately associate milkweed with monarchs, but of course there are a variety of species of insects and other animals that live in or feed on milkweed. Monitoring a milkweed patch for monarch caterpillars with the Monarch Larva Monitoring Project (MLMP) is a great way to contribute to citizen science, but the diversity of species on milkweed means that there are many other activities in which you can engage as well. In recent newsletters, we've written about the need to report observations of the unexpected cycnia moth (*Cycnia inopinatus*), which lays its eggs on milkweed, as well as submitting samples of milkweed leaves for genetic testing. Here are some other things you can do to make the most of your milkweed:



Top: Asclepias incarnata. Photo: Wendy Caldwell

Bottom: Stink bug eggs on milkweed. Photo: Sondra Cabell

Milkweed Watch

- This is a new citizen science project in Nebraska that seeks to measure the biodiversity in milkweed patches across the state. It is run by scientists at the University of Nebraska-Lincoln, and according to Milkweed Watch's Dr. Tom Weissling, the goals of the project are to "determine what animal species use milkweed plants, to determine the diversity and distribution of milkweed plants in Nebraska, and to promote awareness about and appreciation of milkweeds." Milkweed Watch staff are particularly interested in documenting the presence of Red Milkweed Beetles (*Tetraopes*), so that they can update the state's distribution records for those species.

  The project began in 2014 and expanded this summer when staff held training sessions to teach volunteers how to identify milkweed and commonly found insects, record their findings, and submit their data. More volunteers are needed to gather records throughout the entire state. If you live in Nebraska, there are several ways that you can contribute to Milkweed Watch. First, all volunteers need to visit the project's website at milkweedwatch.unl.edu and register. Volunteers can monitor existing patches of milkweed, plant their own to monitor, or they can submit anecdotal observations of what they see on milkweed. Data are entered on iNaturalist.org, a website that tracks nature observations from all over the world. If you don't live in Nebraska, you can still follow the progress of Milkweed Watch. Up-to-date citizen science observations can be viewed on the project's iNaturalist page, and you can find project updates and wonderful photographs on their Facebook page.

MLMP Aphid and Milkweed Characteristics Studies

- In addition to asking volunteers to monitor milkweed patches for monarch larvae and report on parasitism rates, MLMP also offers volunteers the chance to collect data on the presence of aphids on milkweed plants, and to study what characteristics make monarch females lay their eggs on specific milkweed plants. For the latter study, volunteers compare milkweeds with eggs or larvae on them to randomly selected milkweed, and they record things like plant height, herbivore damage, and the presence of other invertebrates. To participate in these MLMP activities, read more at mlmp.org. Use the field guide Milkweed, Monarchs, and More to help identify what you find on your milkweed!

Monarch Joint Venture Photo Contest on Facebook

- MJV just launched the "What's in the Milkweed Patch?" Photo Contest. Now through November 1, submit your photos of the amazing flora and fauna you find in your milkweed patch. Two contest winners will be selected based on the number of "likes" their photos receive and ranking from contest administrators. Visit the MJV Facebook contest to learn more and submit your photos.

New Research Shows Complexities in Monarch Population Trends

A new issue of the Annals of the Entomological Society of America focuses on the eastern breeding and migratory monarch population. The seven articles in the monarch issue describe different trends in the monarch population. Taken in concert, these articles emphasize the complex dynamics of this population. The vast majority of the data described in the articles were collected by citizen scientists, highlighting the important role that volunteer efforts play in understanding and protecting the monarch. Below is a brief summary of the articles.

Investigating Long-Term Changes in the Spring Migration of Monarch Butterflies (Lepidoptera: Nymphalidae) Using 18 Years of Data From Journey North, a Citizen Science Program by Elizabeth Howard and Andrew K. Davis

- Journey North, which tracks the monarch migration, has over 11,000 contributions from citizen scientists reporting their first adult monarch sighting of the spring. In this article, the authors used those data to look for changes in the time of migration and the geographic range of the monarch. After controlling for the increased number of volunteers submitting observations, the analysis revealed the spring migration is happening later by about 1 day every 4 years, which could indicate a declining monarch population, assuming that observers are less likely to spot individual monarchs when they are rarer. The authors also found that the geographic size of the initial wave of spring migration had gotten smaller over time, but that the eventual total geographic range of the monarch during the breeding season had remained unchanged. It is possible that even as the overwintering and initial spring migratory population has declined, monarchs are still able to reproduce in large enough quantities to spread out across their traditional range.

Long-term Trends in the Number of Monarch Butterflies (Lepidoptera: Nymphalidae) Counted on Fall Migration at Long Point, Ontario, Canada (1995–2014) by T. L. Crewe and J. D. McCracken

- This study used data collected by volunteers with the Long Point Bird Observatory in Ontario, Canada. From 1995 to 2014, volunteers have done daily counts of fall migratory monarchs at two points along Long Point Peninsula. An analysis of these records found a decline in monarch observations of about 5% per year, with slight differences in the size of the decline between sites and a sharper decline over the last decade. This recorded decline in monarchs is consistent with decrease in the size of the eastern monarch population at the overwintering grounds in Mexico.

Trends Observed in Fall Migrant Monarch Butterflies (Lepidoptera: Nymphalidae) East of the Appalachian Mountains at an Inland Stopover in Southern Pennsylvania over an Eighteen Year Period by Gayle Steffy

- Gayle Steffy is a long-time monarch citizen scientist who tagged and released thousands of monarchs in Pennsylvania between 1992 and 2009 and recorded whenever the tags were recovered in the overwintering grounds in Mexico. She compared her tag recovery rate to monarchs from other locations and found that her tags were recovered more often than tagged monarchs from sites along the Atlantic coast, suggesting that inland monarchs were more likely than coastal monarchs to successfully migrate all the way to Mexico. She also found some evidence that female monarchs were more likely than males to migrate successfully and that monarchs reared indoors were smaller and less likely to be recovered in Mexico than wild monarchs.

Population Trends of Monarchs at a Northern Monitoring Site: Analyses of 19 Years of Fall Migration Counts at Peninsula Point, MI by Gina Badgett and Andrew K. Davis

- Since 1996, volunteers in Peninsula Point, Michigan have been conducting daily fall censuses of migrating monarchs. This study examined the data from those censuses in order to see if they were seeing fewer monarchs in Peninsula Point over time. Unlike the data from the overwintering counts in Mexico, which do show a sharp decline in monarch numbers, these data indicate that the monarch population migrating through Peninsula Point has held steady over the years. In fact, there was even a very slight trend towards an increase in monarchs over time, but that trend was not statistically significant. The authors of this paper suggest that their results could indicate that the breeding population of monarchs in the Peninsula Point area, the northern part of the monarch's range, remains unchanged but that the population is declining during the fall migration. They call for an increased focus on protecting and creating migratory habitat for monarchs, in order to protect that part of the annual life cycle.

Continued on Page 4

New Research Shows Complexities in Monarch Population Trends, *continued from Page 3*

The Disconnect Between Summer and Winter Monarch Trends for the Eastern Migratory Population: Possible Links to Differing Drivers by Leslie Ries, Douglas J. Taron, and Eduardo Rendón-Salinas

- This paper looks at monarch population numbers in the Mexico overwintering grounds as well as in the North Central part of the summer breeding range. The data on summer numbers come from two separate citizen science programs, the North American Butterfly Association (NABA) and the Illinois Butterfly Monitoring Network. It is important to note that these monitoring programs are not conducted at random locations, but rather in areas where there is remaining habitat, and thus are not assessing the size of the whole population, but rather the population in "good habitat". The authors found evidence of an increasingly steep decline in overwintering monarch numbers. In contrast to the overwintering data, the two sets of data on the adult breeding monarch population did not show evidence of an overall upward or downward trend from 1993 to the present. The authors did find some evidence of a decline in the summer population in more recent years and suggested that there should be careful attention paid to the population numbers in the next few years to determine if a downward trend emerges.

Habitat Productivity and Temporal Patterns of Monarch Butterfly Egg Densities in the Eastern United States by Carl Stenoien, Kelly R. Nail, and Karen S. Oberhauser

- Monarch Larva Monitoring Project (MLMP) volunteers from across the country conduct weekly monitoring of milkweed patches for monarch eggs and larvae throughout the breeding season. In this paper, the authors examined MLMP data from 1997 to 2014 to look for trends in monarch egg density (number of eggs per milkweed plant) over time and across different types of sites. The data showed a decline in egg densities starting in 2006, with a significant correlation between the decline in egg density and the decline in the overwintering monarch population. The authors conclude that the downward trend in egg densities results from there being fewer and fewer adult monarchs to find and make use of the existing milkweed habitat. They suggest that there is a need for the creation of more milkweed patches in order to ensure that all female monarchs will be able to find milkweed and ultimately boost the monarch population.

Monarch egg. Photo: Becky Janopoulos

Immature Monarch Survival: Effects of Site Characteristics, Density, and Time by Kelly R. Nail, Carl Stenoien, and Karen S. Oberhauser

- This paper also used data from the Monarch Larva Monitoring Project from 1997 to 2014, but it used a smaller subset of data to examine survivorship rates and determine if monarch larvae survival has changed over time. They found that on average 7-10% of monarch eggs survive to the fifth instar and that survival rates have declined over the course of the study. Survival was higher in sites that had more milkweed, had lower densities of monarch eggs, and that were planted (as opposed to natural sites); survival could be higher at planted sites due to the benefits of watering and weed control. Finally, the study found that for every 29 milkweed plants, on average one monarch egg survived to become a migratory adult. This number could be used to guide conservation planning and habitat management in order to determine how much milkweed is needed throughout the breeding range of the monarch; however, the authors caution that this is a conservative estimate because it does not account for pupal mortality.

We want to hear from you!

Are you are a butterfly citizen scientist with a story, photos, or artwork to share? Would you like to nominate a volunteer or program for recognition in the newsletter? Write to us at *monarchs@monarchjointventure.org* with what you would like to see in the newsletter.

Help us spread the word. Send this newsletter to friends who may be interested, and encourage them to "Get Updates" under News & Events on the MJV website at monarchjointventure.org/news-events/get-updates.