www.projecticp.org

Project ICP is a Coordinated Agricultural Project, funded by the Specialty Crops Research Initiative of the USDA.

USDA NIFA
United States Department of Agriculture
National Institute of Food and Agriculture

Project ICP is a collaboration between:
AgPollen LLC
Franklin & Marshall College
Loyola University
Michigan State University
Oregon State University
Pennsylvania State University
Rutgers University
St. Mary-of-the-Woods Coll.
Simon Fraser University
The Xerces Society
UC Davis
UC Berkeley
University of Florida
University of Vermont
USDA Pollinating Insects Lab
Wenatchee Valley College

Project ICP Update

Funded by the USDA's Specialty Crops Research Initiative in 2012, the Integrated Crop Pollination project (www.projecticp.org) is a coordinated effort of fifteen organizations. Working in almond, apple, blueberry, cherry, raspberry, pumpkin, and watermelon farms, this team of almost 50 scientists and extension-outreach specialists are comparing different approaches to crop pollination.

The 2013 field season was the first year for this effort, and the teams have gathered data on bees and other insects visiting flowers at over 100 farms across the nation. At each farm the bee collections were combined with sampling for the level of pollination and the crop yield at increasing distances into the crop plantings. This information will be used to assess the relative importance of honey bees and wild bees for production of these crops.

The team is also interested in examining how the addition of wildflower plantings to attract and support pollinators may influence pollination. It can take several growing seasons for habitat plantings to be prepared, planted, and established. Sites were prepared for planting during the summer of 2013 and were seeded in the fall in many regions. The plantings will start to bloom in the next few years. "This highlights why long-term funding programs such as the SCRI program are so important", said Dr. Rufus Isaacs, director for the project.

Another objective of the project focuses on the role of alternative pollinators. In 2013, blue orchard bees were evaluated in almonds. Currently, the project team is preparing for bumble bee and *Osmia* bee evaluations in tree fruit and berries starting in 2014. The team is also coordinating information on how to best manage these alternative bees for crop pollination, and will be able to build on their own experiences in this project to develop useful guides to aid growers considering these approaches to pollination.

This project has been affected by the budget uncertainty in Washington DC, because our Year 2 plans require a new Farm Bill to be passed before they will receive any funding. The team remains hopeful that these budget issues can be resolved to allow this project to build on the momentum created during 2013.

Despite the impasse, the team has been adapting and will be conducting grower surveys online this winter to gather the information that was planned to be done through USDA-NASS. Look for a future announcement of the pollination survey, coming up later this winter.

Outreach events highlighting the work of the ICP team are also planned for 2014 across the country.

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Year 1 Progress at a glance

- In almond, the extremely early bloom time resulted in only honey bees and Blue Orchard Bees being observed visiting blossoms at the twenty commercial sites in California.

- In apple, thirteen orchards in Michigan and Pennsylvania were sampled for pollinators and yield across a range of landscape types.

- In cherry (sweet and tart), over 2,500 bee visitations were recorded during sampling in the thirteen orchards in this study.

- In blueberry, over 8,800 bee visits were recorded from blossoms across 58 fields sampled in Florida, Michigan, Oregon and British Columbia. Approximately 4,000 flower clusters were included in the pollinator exclusion experiments to measure the effect of pollination on yield.

- In raspberries, ten raspberry fields in Oregon were sampled and over 850 bee visitations were recorded.

- In pumpkin and watermelon, thirty-five sites have been sampled in measure pollination effects on yield California, Florida, and Pennsylvania.

- Wildflower enhancements have been planted in Pennsylvania apple, Michigan blueberry and cherry and in California almond and watermelon. Sites for additional plantings are being prepared in the other regions and crops.

A bumble bee visits blueberry blossoms in Michigan. Photo by Dr. Rufus Isaacs.

Project ICP Objectives

1. Identify economically-valuable pollinators and the factors affecting their abundance.

2. Develop habitat management practices to improve crop pollination.

3. Determine performance of alternative managed bees as specialty crop pollinators.

4. Demonstrate and deliver ICP practices for specialty crops.

5. Determine optimal methods for ICP information delivery and measure ICP adoption.

6. Economics and modeling of pollination ecosystem services.

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A wetland restoration (above) at the Cardno JF New Nursery and rain garden (below) highlight the value of native plants to visitors. Photos by Jennifer Hopwood.

Advisory Committee Partner Spotlight

Cardno JFNew is an experienced ecological services firm that has been providing innovative and sustainable solutions to challenging environmental issues since 1989. Our multidisciplinary teams of professionals provide a full range of ecological consulting and restoration services, with expertise in the management of natural resources, water resources, and cultural resources, as well as streamlined regulatory permitting and compliance. The Cardno JFNew Native Plant Nursery provides more than 350 species of native plants and seed as well as bioengineering materials and the staff expertise to create customized restoration, mitigation, and native landscape projects.

Cardno JFNew has offices in Illinois, Wisconsin, Michigan, Ohio, Indiana and Kentucky. Among our key service areas are watershed planning, stream and ecosystem restoration, mitigation design, full wetland services, endangered species consulting, natural systems for stormwater/wastewater, archaeology, and green infrastructure. As part of the Cardno family, we also provide clients with access to the full resources of Cardno's extensive US and global service capabilities with professional staff and offices in more than 290 US locations.

www.cardnojfnew.com
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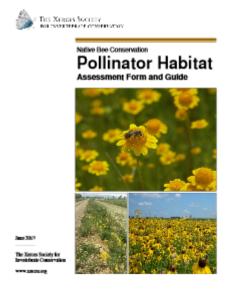
Visit our project website: www.projecticp.org

Through our website, you'll find detailed information about the project, as well as links to project partners, updates on project outcomes, and resources on pollination, pollinator management, and habitat for pollinators.

You can also learn more about our project on Facebook: www.facebook.com/IntegratedCropPollinationProject

You'll find photos, videos, links to news articles, and more!

New Resources from the Xerces Society: Pollinator Habitat Assessment Form and Guide

This assessment form and guide can be used to help farmers to assess specific pollinator habitat features before and after undertaking habitat enhancement projects in orchards or field crop settings. The Pollinator Habitat Guide can be found at:
http://www.xerces.org/wp-content/uploads/2009/11/PollinatorHabitatAssessment.pdf

Pollinator habitat enhancement on a MI blueberry farm. Photo by Dr. Brett Blaauw.

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Meet the Project ICP Post Doctoral Researchers….

Project ICP relies on the hard work and dedication of some excellent young scientists who are leading the project's research in California, Utah, Michigan, Vermont, Florida, Pennsylvania, and Oregon. We thought this newsletter would be a good way to introduce them and show how they each fit into the team.

Derek Artz
USDA-ARS Pollinating Insect Unit

I have been a Postdoctoral Associate with the USDA-ARS Pollinating Insect Research Unit in Logan, Utah since November 2010 working mainly on the development of the blue orchard bee, *Osmia lignaria*, for commercial use, particularly as almond pollinators. My field and lab studies are directed at enhancing the efficacy of blue orchard bees by varying the stocking density of bees as well as the density and distribution of nesting boxes within commercial orchards. My research also involves conducting field trials to evaluate fungicides and surfactants for lethal and sublethal effects on blue orchard bees and alfalfa leafcutter bees, *Megachile rotundata*. My role in Project Integrated Crop Pollination (ICP) is to determine the abundance and visitation rates of blue orchard bees, honey bees, and other pollinators to almond flowers in large commercial orchards in California. Prior to joining USDA-ARS, I worked as a Postdoctoral Associate at Cornell University studying native bee pollinators of pumpkin in New York and hawkmoth pollination of evening primrose in western North America.

Claire Brittain
University of California - Davis

In the ICP project, I am compiling spatial data for all sampling sites to analyze the landscape composition at different scales. In addition, I am helping to monitor wildflower plots adjacent to almond orchards, looking at flower phenology and their use by bees. One of the aspects of the ICP project that most appeals to me is its ability to test the effectiveness of habitat enhancements at supporting pollinators and crop pollination across multiple systems in different regions of the US.

I received my PhD from the University of Reading, U.K. where I worked with Simon Potts on the impact of insecticides on pollinating insects at multiple spatial scales. Afterwards, I joined Alexandra-Maria Klein's Ecosystem Functions group at Leuphana University, Germany as a postdoc. Whilst there I worked on local and landscape drivers of pollinator diversity in California almond orchards and the benefits of diversity for almond pollination.

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….Meet the Project ICP Post Doctoral Researchers….
Jason Gibbs
Michigan State University

I am very keen on bees. My father is a commercial beekeeper in Canada so I have been around bees my entire life. I am fascinated by the biological diversity of bees and its evolutionary origins. As a PhD student in Toronto and then a post-doctoral researcher at Cornell, I focused my attention on understanding the taxonomic diversity and evolutionary history of sweat bees. I became involved in Project ICP to learn more about the role bees play in agricultural systems. My position in the project is to lead the Objective 1 team in learning about economically important pollinator species of specialty crops. I am also the lead for the blueberry team and run the Michigan portion of the blueberry studies. I've enjoyed collecting bees in Michigan, particularly the two blueberry specialist bees *Andrena bradleyi* and *Andrena carolina*, which have evolved unusually long heads for reaching the nectaries of blueberry flowers. I look forward to learning more about the wild bee fauna of Michigan and how landscape and management factors affect their diversity in farms.

Insu Koh
University of Vermont

I am currently a postdoctoral associate advised by Dr. Taylor Ricketts at the Gund Institute for Ecological Economics and co-advised by Dr. Eric Lonsdorf, Research Scientist at the Chicago Botanic Garden. My research goal in the ICP project is to develop a spatially-explicit statistical model of pollination services and apply this model to several agricultural landscapes and crops within the US. I am particularly interested in: (1) understanding how habitat management and surrounding landscape influence the abundance and diversity of bees in crops, (2) developing a spatially-explicit statistical model of pollination service prediction in different crops, and (3) predicting impacts of habitat enhancements on pollinator communities and crop **productivity.**

To address these issues, my current research uses ArcGIS and R to conduct spatial and statistical analyses that will be used to develop a pollination model. I'm broadly interested in how landscape structure and composition influence biodiversity, organism dispersal and ecosystem services. This interest began when I considered the role of traditional Korean landscape configuration in mitigating environmental conditions. After that, my interests moved towards how landscape connectivity influences organism dispersal as related to ecosystem services such as seed dispersal, biological pest control, and pollination. Currently, I'm focusing on modeling crop pollination services provided by bees across agricultural landscapes within the

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....Meet the Project ICP Post Doctoral Researchers....

Mark Otieno
Pennsylvania State University

I am involved with implementing ICP project objectives in Pennsylvania by conducting studies that define the community composition and abundance of bees in pumpkin and apple crops. My overall role is to determine the value of wild bees for providing pollination service to these crops. I am also involved with activities aimed at evaluating the effects of landscape, habitat manipulation and supplementation with managed bees on bee abundance and pollination services.

ICP has a great potential for supporting long-term sustainability of specialty crop production in the U.S. Using multidisciplinary approaches to determine and quantify various farm and landscape contexts in which managed bees and wild bees can be utilized, it will help growers achieve efficient and economic crop pollination service. It is also important in increasing the ability of growers to better manage pollinators to improve their crop yield and in increasing awareness of the importance of native bees among the public.

Cory Stanley
University of Florida

As a postdoctoral researcher in UF's Honey Bee Research and Extension Laboratory, I am overseeing all aspects of UF's contribution to Project ICP's efforts to incorporate habitat enhancement for wild bees, farm management practices to support bees, and the use of diverse managed bee species for pollination in blueberries and watermelons, I recently came to UF from Utah State University Extension, where I worked for 3 years in a dual role as coordinator of the Cooperative Agricultural Pests Survey and as the Extension Bee Specialist. Prior to that, I received my PhD from Utah State University in 2010 as a result of research conducted at the USDA ARS Pollinating Insect Research Unit. That research focused on learning abilities of solitary bees and factors influencing nest establishment in commercial populations of managed solitary bees. Additionally, I collaborated with a national research team working to determine effective trapping methods for spotted wing drosophila.

I love working with growers, learning about what is important to them, and working together with them to help them be more successful. I love the positive impact that I can have on our environment and our food supply by working with bees and working on this project. I also love the opportunity to live in Florida. This is a wonderful new adventure for my family, and I get so excited every time I encounter a new plant or animal while I'm out in the field!

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Questions or comments on the newsletter?

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To get on our **mailing list** for this newsletter, just email a request to Jennifer Verba at **verbajen@cns.msu.edu**

Recent Project ICP Presentations

Team members gave over 45 presentations involving aspects of Project ICP in 2013. If you weren't able to attend, keep an eye on our project website (www.projecticp.org) or on Project ICP's Facebook page: there are plenty of events planned for 2014! Some slideshows from the recent Great Lakes Fruit, Vegetable, and Farm Market Expo in Grand Rapids, MI in December of 2013 are also available on our Facebook page.

Participating Institutions and Organizations

Michigan State University (Lead Institution)
- Rufus Isaacs, Jason Gibbs, Larry Gut, Nikki Rothwell, and Julianna Wilson

AgPollen, LLC
- Steve Peterson

Franklin and Marshall College
- Eric Lonsdorf

Loyola University, Chicago
- Kelly Garbach

Oregon State University
- Sujaya Rao

Pennsylvania State University
- Shelby Fleischer and David Biddinger

Rutgers University
- Rachael Winfree

Simon Fraser University
- Elizabeth Elle

University of California, Berkeley
- Claire Kremen

University of California, Davis
- Neal Williams, Karen Klonsky, and Mark Lubell

University of Florida
- Jamie Ellis and Jaret Daniels

University of Vermont
- Taylor Ricketts

USDA-ARS Pollinating Insects Lab
-Theresa Pitts-Singer, Jim Cane, and Jamie Strange

Wenatchee Valley College
- Bob Gillespie

The Xerces Society
- Mace Vaughn and Jennifer Hopwood

In the Next Issue...

Depending on the progress with the Farm Bill, our next issue of Project ICP News is scheduled for January 2015. Look for research updates, and links to new extension products from the team. Project ICP summer extension meetings and pollinator workshops will be moving forward in 2014 and we will feature these in the next newsletter.

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