Bring Back the Pollinators

Annual Report

The Xerces Society for Invertebrate Conservation
August 2015

The Xerces Society
for invertebrate conservation

THE XERCES SOCIETY
FOR INVERTEBRATE CONSERVATION

Protecting the Life that Sustains Us

The Xerces Society for Invertebrate Conservation is a nonprofit organization that protects wildlife through the conservation of invertebrates and their habitat. Established in 1971, the Society is at the forefront of invertebrate protection, harnessing the knowledge of scientists and the enthusiasm of citizens to implement conservation programs worldwide. The Society uses advocacy, education, and applied research to promote invertebrate conservation.

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Regional offices in California, Massachusetts, Minnesota, Nebraska, New Jersey, North Carolina, Texas, Vermont, and Wisconsin.

The Xerces Society is an equal opportunity employer and provider.

Front Cover Photograph by Anne Stine, The Xerces Society.

With staff based in nine states, the Xerces Society's pollinator conservation program is able to build effective partnerships with farmers and agency staff across the county. The result is hundreds of thousands of acres of new pollinator habitat. This photo shows pollinator-friendly grazing land in Texas, a conservation practice that provides forage for both livestock and pollinators.

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Oregon · California · Massachusetts · Minnesota · Nebraska
New Jersey · North Carolina · Texas · Vermont · Wisconsin

www.xerces.org

Overview

Not that long ago, pollinators were rarely discussed outside of scientific circles. Today, bees, butterflies, and other pollinators are the focus of policy debates, school curricula, gardening workshops, and the labels found on grocery store shelves. Given the ecological, economic, and nutritional importance of these animals—and unfortunately their decline—pollinator conservation is attracting new and much-needed attention. A particularly notable example is the release of a first-of-its-kind comprehensive pollinator conservation strategy announced by the White House. The Xerces Society, as a leading voice for pollinator conservation, played a key role in the development of the White House strategy, but that achievement was only possible because of the support we receive from partners, most importantly, you.

As a partner in the *Bring Back the Pollinators* campaign, you are part of a successful, broad-reaching initiative that is improving conditions for some of the world's most important animals. With your support for the Xerces Society's signature pollinator conservation effort, we are working to restore wildflowers as the natural habitat for our native crop-pollinating bees, helping farmers reduce negative impacts on pollinators, protecting rare and declining species, and increasing food security by helping farmers take full advantage of the native pollinators that are already present on and around farms across the country and internationally. We are also building support for pollinator conservation among the public and within government agencies, in order to expand pollinator habitat in varied settings, reduce pesticide use, and develop long-term commitments to pollinator conservation.

The ultimate definition of success for the Bring Back the Pollinators campaign is full, lasting protection for pollinators. To assess our progress toward this long-term goal, we track impacts in the following categories:

Pollinator Habitat
Measured as an increase in acres of habitat restored or protected.

Practical Solutions and Improved Methods
To understand the status of our most vulnerable pollinators and refine techniques for pollinator conservation that meet the needs of farmers, land managers, gardeners, and others.

People Involved
Including people attending our trainings or other educational events, food producers that we assist in adding pollinator habitat to their operations, and people who have accessed our online resources or followed us online (through Facebook, Twitter, and our e-newsletter).

Policy Interventions
Indicated by new regulations or other protective government actions that prioritize pollinators and/or limit pesticide use.

In this report, we highlight our progress over the past year. With your help, the campaign reached several milestones and laid the groundwork for continued impact.

Pollinator Habitat

Habitat loss is a major cause of native pollinator declines worldwide. Restoring lost habitat and protecting what remains are key strategies for the Xerces Society.

Creating 200,000 Acres of Wildflowers

Since 2008, our efforts have culminated in the restoration or protection of pollinator habitat on more than 200,000 acres of U.S. farmland (up from 169,000 acres last year), with thousands more acres in development. These 200,000 acres of wildflowers provide healthy food for bees and other pollinators. Thanks to the diverse plantings at these sites, pollinators have access to pollen and nectar resources throughout the growing season, not just for a short period of time. As these meadows mature and the plant community changes over time, the diversity of pollinator plants will ensure that there are wildflowers available over many years.

Pollinator habitat test meadow at the Lockeford Plant Materials Center, featuring a variety of native wildflowers, including baby blue eyes (*Nemophila menziesii*), California poppies (*Eschscholzia californica*), and common tidy tips (*Layia platyglossa*). Photo: Jessa Kay Cruz, The Xerces Society.

Advancing Native Milkweed Seed Production: Project Milkweed

Because milkweeds are the only food source for monarch butterfly caterpillars, their restoration in landscapes where these native wildflowers have disappeared is critical to reversing the decline in monarch butterfly

numbers. Milkweed is also a valuable nectar plant for countless bees and other beneficial insects. A scarcity of milkweed seed in many regions of the United States has limited opportunities to include these plants in habitat restoration efforts. To address this seed shortage, the Xerces Society launched Project Milkweed, a collaboration with the native seed industry, the USDA Natural Resources Conservation Service's Plant Materials Program, the Monarch Joint Venture, and community partners to produce new sources of milkweed seed in key areas of the U.S. where native milkweed seed had not been reliably available.

To date we have launched seed production for eleven milkweed species in California, Arizona, New Mexico, the Great Basin, Texas, and Florida, key areas of the monarch's breeding range where native seeds had not been available. Over 3 million seeds were sustainably collected to start this effort, and so far, our work has resulted in the production of more than 40 million seeds.

Integrating Pollinators into Farmscapes

Working with several major food companies, and one of the largest almond producers in the world, Xerces has begun implementing a game-changing strategy for almond production in California's Central Valley. In late 2014, we managed the installation of 5 linear miles of hedgerows and wildflower meadows throughout a 1,000-acre almond orchard. Thousands of flowering, drought-tolerant, native California shrubs have been planted, and hundreds of thousands of wildflower seeds have been sown to create nectar-rich habitat to support the bees that pollinate almonds. Our first-of-its-kind project to integrate a 1-mile hedgerow into an organic tomato processing plant in California also marked its second successful year since planting. The net effect of both projects will be a better landscape for bees in the Central Valley. These projects help us test, refine, and demonstrate achievable techniques, producing an impact that will ripple throughout the farming community.

Muir Glen pollinator hedgerow in bloom, featuring native Bolander's sunflower (*Helianthus bolanderi*), in Central California. Despite a prolonged drought, this hedgerow is thriving even after irrigation was removed. Photo: Jessa Kay Cruz, The Xerces Society.

Protecting Habitat for Imperiled Species

In 2001, the Xerces Society completed a status assessment of the mardon skipper butterfly (*Polites mardon*). This butterfly is found in meadow habitats from Washington State down to northern California. We found that this butterfly had lost a large proportion of its habitat to overgrazing, off road vehicles, encroachment of trees into meadows, farms, and urbanization. We also knew that if we worked with partners to protect and manage mardon sites we could make a real difference for this butterfly. After more than a decade of work, over a thousand acres have been protected as habitat for the mardon skipper butterfly. As of 2014, there is enough habitat that this species does not need to be listed as endangered or threatened under the Endangered Species Act. This is only one example of our on-the-ground work to protect butterflies, bumble bees, and other at-risk species.

The mardon skipper butterfly (*Polites mardon*). Photo: Rich Hatfield, The Xerces Society.

Practical Solutions and Improved Methods

When grounded in research, conservation needs can be more easily prioritized and communicated credibly to policy makers. Scientific approaches also verify which on-the-ground methods are most effective when it comes to habitat restoration. Pollinator conservation efforts have to be informed by accurate assessments of how a species is faring and how well specific methods of protecting habitat work.

Assessing the Risks for the Most Imperiled Pollinators

In 2014, our analyses determined that more than one-quarter of North America's 46 native bumble bees face extinction. This information is being used to push for better protection for the bumble bee at the state and federal levels. Using our information, states have added endangered bumble bees as Species of Greatest Conservation Concern to 25 State Wildlife Action Plans, which will allow their habitat to be restored through the State Wildlife Grant program. Similarly, working with NatureServe (a nonprofit that gathers data on at-risk species), we authored an authoritative assessment that found that monarch butterflies in North America are vulnerable to extinction. The assessment will empower monarch conservation efforts by state agencies and federal agencies like the U.S. Forest Service.

Demonstrating How to Create or Restore Pollinator Habitat

Our previous research helped us determine the best methods for establishing diverse flowering pollinator habitats. As established pollinator demonstration sites begin to mature, farmers are now asking how to maintain the sites to ensure long-term plant diversity, structure, function, and most importantly, pollinator value. Through partnerships with the USDA Natural Resources Conservation Service (NRCS) and academic researchers, Xerces develops practical publications and trainings to convey tested methods. This work, being conducted from New England to California, has included direct recruitment of farmer participants, the creation of local research and demonstration projects, and the hands-on establishment of native wildflower meadows and hedgerows.

Through these research and demonstration projects, we are evaluating multiple approaches to wildflower re-seeding and weed management. These habitat projects are designed to support and increase the pollinators adjacent to crop lands while providing maximum benefit to important crops such as almonds, apples, cranberries, blueberries, and pumpkins. The successes of these efforts are being recorded through a rigorous screening process.

Throughout the country, we worked on several fronts to ensure that pollinator habitat can be sustained for the long term, including the following projects:

Refining Wildflower Seed Mix Recommendations for Long-term Plant Diversity

Based on the results of diverse pollinator seed mixes planted in New Hampshire, Minnesota, and Oregon we began fine-tuning our recommended native seed mixes to account for species that declined after several growing seasons and for other plants that began to take over. These refinements will help maintain plant diversity in wildflower meadows, which in turn helps support pollinator diversity. A diversity

of plant species ensures that (a) pollen and nectar resources are available for pollinators throughout the growing season and (b) that as meadows mature and plant communities change over time, pollinator plants are available over many years.

Testing and Improving Habitat Management

In 2014, we focused on strategies and techniques for managing weeds, harvesting wildflower seeds, and using organic methods to prepare sites for pollinator habitat installation. Projects at sites in California, Oregon, Minnesota, Wisconsin, Pennsylvania, Massachusetts, and New Hampshire are helping us test and refine these strategies and techniques, and to make sure that they are well documented and easy to implement. We expect the results of these projects to have significant value to farmers throughout the country.

Pollinator habitat adjacent to fruit orchards in Pennsylvania. Photo: Kelly Gill, The Xerces Society.

Monitoring and Studying Mature Habitat in New Jersey

In New Jersey, our partners at Rutgers University monitored mature habitat that Xerces helped install. Researchers recorded bee species, bee abundance, floral hosts, and wildflower abundance to compare the pollinators in specially designed wildflower habitat with those in old-field control sites. This research is helping us understand whether the mature sites continue to provide valuable pollinator habitat. At these sites, Rutgers University collaborators have also begun documenting landowners' management practices so that we can determine whether particular management actions influence the success of pollinator plantings. This research will inform guidelines we develop on pollinator meadow management in the Northeast and Mid-Atlantic states for farmers and for the NRCS.

Supporting Organic Farming in Montana

We continue to work with Vilicus Farms, one of the leading dryland organic farms on the Northern

Plains, to create demonstration habitat for pollinators and other beneficial insects. Prepared using only organic techniques, dozens of acres of pollinator habitat now serve as field dividers, separating and buffering organically grown lentils, beans, oats, sunflower, buckwheat, barley, and more.

Making Habitat for Midwest Monarchs

In Minnesota and Wisconsin, we are establishing multiple high-density wildflower plantings for monarch butterflies on a diverse range of different farms, including a conventional corn and soy farm, various organic fruit and vegetable farms, and a dairy farm. Most of these habitat areas are being prepared using solarization, an organic soil treatment process, before planting them with seed mixes of milkweed, beebalm, meadow blazingstar, and other important monarch plants.

Xerces Society staff work with farmers at Uproot Farm, a vegetable CSA farm in Isanti County, MN to solarize a site that will be used to plant monarch butterfly habitat. Many hands made quick work! Photo: Sarah Foltz Jordan, The Xerces Society.

Increasing Beneficial Insects on Oregon Berry Farms

At multiple blueberry and canefruit farms in western Oregon, we have established native wildflower field borders to support pollinators and beneficial insects for adjacent crop production. Several of these farms do not rent commercial honey bee hives for pollination, and several do not apply insecticides, making the farms even more dependent on the services of beneficial insects. Moreover, the most significant pest insect of berry crops in Oregon, spotted-wing drosophila, uses weedy wild blackberry patches on the edge of farm fields as refuge. By converting those weedy areas to beneficial insect habitat, we are able to reduce areas for pest populations, while increasing the abundance of beneficial species.

Managing Rangelands for Pollinators in Texas and Oklahoma

Working rangelands can also provide habitat for—and benefit from—pollinators, but pollinator protection doesn't happen accidentally on these lands. Common rangeland practices such as grazing, mowing,

and prescribed burns can be adapted to benefit pollinators. In Texas and Oklahoma, we're advising ranchers and the agencies that support them on how to take pollinators, especially monarch butterflies, into account on their properties. Later this year, we'll be releasing a new technical guidance document on grazing and another on integrated pest management approaches to fire ants, so that pollinators aren't inadvertently harmed.

Project Integrated Crop Pollination

Working with a dozen American and Canadian universities, Project Integrated Crop Pollination (ICP) is a multi-year research partnership investigating the performance, economics, and farmer perceptions of different pollination strategies in various fruit and vegetable crops. These contrasting strategies include a complete reliance on honey bees, farm habitat restoration to support wild bees, and use of alternative managed bees (i.e., other than honey bees) such as mason bees.

Project ICP's research team includes the leading pollination ecologists of our time, including the Kremen Lab at UC Berkeley, the Isaacs Lab at Michigan State, the Winfree Lab at Rutgers, and many others. As a project co-director, Xerces is overseeing and carrying out the delivery of the research team's findings to farm audiences across the country through traditional media, new media, and farmer workshops.

The findings from all of these demonstration projects have been used to develop a series of easy-to-use habitat installation guides for farmers in multiple regions of the country. These guides provide a critical link to the widespread adoption of pollinator habitat restoration, and they are continually improved as we learn more about site preparation techniques that are appropriate for organic farmers, and ongoing management strategies that can help maintain floral abundance.

Developing Resources on Milkweed

Our website and publications reach tens of thousands of people a year, and we continue to develop timely resources for a variety of audiences. Our resources on milkweed are among the most popular of our offerings. In the spring of 2014, we launched the Milkweed Seed Finder (http://www.xerces.org/milkweed-seed-finder), a comprehensive online directory of milkweed seed vendors throughout the country. This valuable resource connects interested customers, including monarch enthusiasts, private landowners, restoration practitioners, and natural resource agencies, with regionally appropriate seed sources. To date, the Seed Finder webpage has received over 115,000 visits.

Protecting Pollinators on Roadsides

Agricultural lands aren't the only places that can support pollinators. Roadsides represent additional conservation opportunities that can connect otherwise isolated patches of pollinator habitat. In collaboration with environmental consultants at ICF International, Xerces prepared a report titled *Literature Review: Pollinator Habitat Enhancement and Best Management Practices in Highway Rights-of-Way for the Federal Highway Administration*, which was released in May 2015. This literature review is the first product of a contract to develop roadside best management practices. These roadside BMPs are in development and should be released later this year. The literature review includes sections on the importance and decline in pollinators, the threats to pollinators associated with roads, and restoration and vegetation management for pollinators. It also includes case studies of successful roadside management.

People

Bumble Bees of Minnseota Identification Workshop, taught by Sarah Foltz Jordan, The Xerces Society, and Elaine Evans, University of Minnesota. Photo: Pam Herou.

The Xerces Society builds the base of pollinator allies by working with many audiences (farmers, agency personnel, gardeners, and nature lovers) to spread the word about the importance of pollinators and their habitat needs, as well as to convey concrete steps that people can take to protect these animals. Our reach is increasingly international, thanks to our online presence and to partnerships that have taken our staff to other countries.

Training and Educating Pollinator Conservationists

Since 2009, we have reached over 40,000 agricultural professionals, federal and state agency staff, and other pollinator conservation practitioners in all 50 U.S. states, as well as researchers and rural development professionals in Asia, Europe, and Latin America at full-day "bee-safe farming" workshops, farm field days, and our Pollinator Conservation Short Course.

Highlights of these training and educational events include:

Motivated Farmers and Gardeners

- In June 2014, 85 people turned out to the Kansas Pollinator Conservation Workshop, with some farmers and ranchers driving more than 5 hours to attend.
- Beginning in November 2014, we made 9 presentations to more than 750 people in 4 states about how they can incorporate habitat for native beneficial insects for pest control in their farms and gardens.
- In January 2015, the Xerces Society gave a talk to a standing-room-only crowd at the Chicago Botanic Garden on what gardeners can do to help the monarch butterfly as part of World Environment Day.
- During "Gardening for Beneficial Insects" at Bowman's Hill Wildflower Preserve in New Hope Pennsylvania, BHWP members, naturalists, Master Gardeners, students, and birders learned about methods of pest control in the garden that rely on predatory native insects.

Diverse Landscapes

- Staff from conservation districts, county road authorities, the Iowa Department of Transportation, prairie restorationists, and more attended a Xerces-led webinar titled "Managing Roadsides and Utility Corridors for Pollinators," reflecting our increasing attention on these landscapes.
- During the presentation "Providing Habitat for Pollinator Conservation Presentation for NASA Green Team," Xerces staff made a presentation and led a discussion regarding the planning process for pollinator habitat in a NASA compound and arsenal site.

At-Risk Species

- In the summer of 2014, we presented our new bumble bee conservation short courses six times in Pacific Northwest and Upper Midwest states. Members of the public, land managers, and agency biologists learned about bumble bee identification, biology, ecology, conservation status, threats, conservation needs, and steps that individuals can take to conserve bumble bees.
- Xerces staff have presented on monarchs and monarch conservation in diverse settings including meetings for the staff of the NRCS, U.S. Fish and Wildlife Service, and Texas State Parks; the Ecological Farming Association (EcoFarm) conference in California; the Pacific Grove (California) Museum of Natural History, and several universities.

Native Plant Enthusiasts

- In early April 2014, we co-conducted a native plant field day at the USDA Plant Materials Center in California. More than 100 federal, state, and local farm agency staff learned about native plant selection and establishment for pollinator conservation and cover cropping for pollinators.
- At the 2015 California Native Plant Society conference, we led a workshop session on milkweed and native wildflower propagation techniques that was attended by nursery professionals, naturalists, state and federal agency staff, and gardeners from across the state.

Extended Geographic Reach

- Working with the United Nation's Food and Agriculture Organization, Xerces pollinator staff delivered

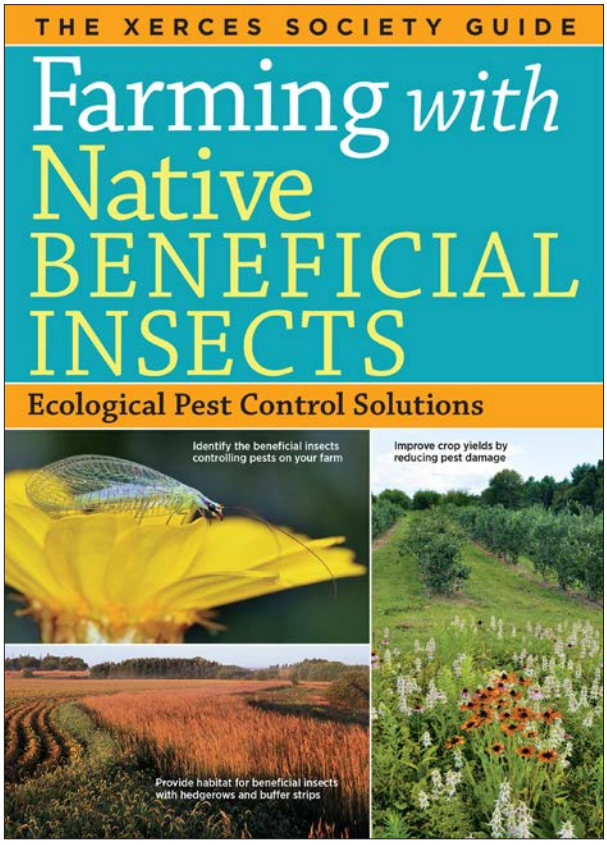
a workshop in Poznan, Poland, in December 2014, on how to conduct farmer-focused conservation trainings. This workshop was intended to help agricultural educators inspire the farm communities they work with, and encourage the adoption of bee-safe farm management practices. Participants came from Germany, Hungary, Italy, Poland, Sweden, the Netherlands, and the United Kingdom.

- During CanWest, the largest commercial horticulture trade show in western Canada, we delivered a 90-minute Bring Back the Pollinators session.
- In March 2015 we conducted a pollinator conservation and natural pest management training for food industry agronomists in Irapuato, Mexico. The Irapuato area is one of the largest global sources of fruits and vegetables, and is a major base of operations for companies such as Green Giant, Earthbound Farm, and Amy's Organic. Many of these companies have local agronomist teams that provide technical expertise to their contract farmers.

Expanding and Updating Our Trainings

The Xerces Society is committed to keeping our trainings and educational events relevant and timely. During the grant period, we drew on the latest research on pollinator conservation, our newest publications, and the biggest unmet needs to develop new training offerings.

- In 2014, our latest book, *Farming with Native Beneficial Insects*, was released by Storey Publishing. This book is the most in-depth publication of its kind ever developed for farm audiences on the process of managing farm habitat to increase predators of crop pests. Building on the content of this book, we began offering a new short course in 2015 that synthesizes research around this topic and offers realistic implementation strategies for increasing natural pest control on farms. Specific course topics include beneficial insect biology, designing habitat improvements, pesticide risk reduction, securing financial support through USDA programs, and real world case studies. The audience for the short course includes farmers, integrated pest management specialists, Extension personnel, USDA staff, soil and water conservation district technicians, state departments of agriculture, crop consultants, and sustainable agriculture organizations.



- To support our Pollinator Conservation Short Course and workshop-based training, we developed a new publication on pesticide risk-reduction for the NRCS. This manual provides farmers and USDA NRCS staff with design instructions for pesticide capture systems (such as spray buffers and windbreaks) that reduce chemical movement into nearby natural areas and watersheds. In 2014, we incorporated this information into our short course curriculum and made it available online, allowing tens of thousands of people to access it.

Comments from Workshop and Short Course Participants

"Thank you so much for the pollinator course info. I learned a lot that day and will be planting an acre more of meadow this spring, taking it out of soybeans. I am using the course plant list of grasses and advice from your speakers."

- Farmer, Virginia pollinator conservation planning course

"Well worth getting up at 4 AM to attend!"

- Participant in an Oklahoma Pollinator Conservation Short Course

"I really enjoyed your class at Bedell Cellars. So much so that I ordered pollinator signs for our pollinator garden, our vegetable garden and our vineyard. For the past few weeks I have included pollinator habitat information to a much greater degree in my vineyard tours. Your organization is so inspiring and essential, thank you."

- Participant, New York Short Course

"I really enjoyed the session you taught. The information you provided and the passion you delivered it with really inspired me to find out more about the bees we have on our property and what we can do to better support them."

- Master Gardener who attended a conference presentation in California

"I thought … [the workshop] was really useful (and fun) and showed us how demonstration sites can be used in a professional way."

- Participant, United Nations Food and Agriculture Organization workshop, Poznan, Poland

"The class was awesome!!!!! We planted 4 acres worth of a pollinator mix and next year are hoping for 10 acres."

- Forest Service Staff, South Carolina Short Course

"This presentation was, hands down, the best I've ever been to at EcoFarm. Your presentation was organized and well thought-out, with lots of really great information. Your slides and photos were beautiful! Thank you!!"

- Attendee, California Ecological Farming Conference

"What a day! I thoroughly enjoy the course—the depth, the breadth. I don't know when I have learned so much."

- Participant, Rhode Island Short Course

"Your presentation at the meeting was excellent and the information resources you have provided are many. Your efforts are most appreciated!"

- Soil and Water Conservation District Staff, North Carolina workshop

Providing Technical Expertise to the USDA

Through several shared staff positions, the Xerces Society provides technical consulting to the USDA Natural Resources Conservation Service (NRCS), the largest government agency supporting voluntary conservation on private lands. These highlights from the past year represent the range of ways that we have been supporting the NRCS.

Monarch Butterfly Conservation Effort

After the White House executive order to conserve pollinators, the NRCS initiated a Monarch Butterfly Conservation Effort to improve habitat for migrating monarch butterflies on thousands of acres of private lands, and the Xerces Society stepped up to help. We assisted in the development of an overarching NRCS monarch conservation strategy, as well regional plans and strategies for improving habitat. We also developed tools to support the implementation of these plan, including habitat assessment guides, planting recommendations, and land management recommendations. These efforts should be made available to the agricultural community starting in October 2015.

Monarch butterflies clustering on a pine in Monterey, CA. Photo: Candace Fallon, The Xerces Society.

Honey Bee Habitat Effort

As a companion undertaking to its monarch conservation work, the NRCS also pursued a Honey Bee Habitat Effort, which is creating thousands of acres of high-value forage for honey bees in the Upper Midwest and Northern Plains. We helped develop plant lists, participated in the USDA Honey Bee Habitat Summit, and assisted with honey bee habitat monitoring.

Guide to Using 2014 Farm Bill Programs for Pollinator Conservation

Xerces experts updated USDA technical guidance on how farmers and conservation practitioners can access technical and financial support for pollinator conservation activities through 2014 Farm Bill conservation programs.

Grazing Management to Support Pollinators

Xerces ecologists wrote a guide on grazing and prescribed fire management to support pollinator habi-

tat. This technical note includes information on the timing, duration, and intensity of grazing that best encourages diverse and abundant wildflowers, as well as guidance for using fire as a complementary tool for rangeland management. It will be formatted and printed in time for fall 2015.

Enlisting and Supporting Citizen Scientists

Involving everyday people in monitoring pollinators helps spread the conservation message and also provides much-needed data to inform conservation efforts. One of our longest-running projects—the Western Monarch Thanksgiving Count—has engaged volunteers in data collection about the status of monarch populations overwintering along the California coast since 1997. In 2014 we developed a new online tool to support these volunteer monitors. Using the new Western Monarch Count Resource Center (www.westernmonarchcount.org), citizen scientists can access the latest information on helping understand monarchs in the West.

In 2014, we launched another citizen science project for pollinator protection. We worked with several partners to launch Bumble Bee Watch (www.bumblebeewatch.org), a citizen science effort to track and conserve North America's native bumble bees. Since early 2014, we have garnered the participation of approximately 5,000 individuals and identified more than 40 locations where endangered bumble bee species still persist.

Pledging to Bring Back the Pollinators

Anyone can create and protect pollinator habitat, and the Xerces Society's Bring Back the Pollinators Pledge provides concrete steps to help people do just that. Launched in April 2012, the Bring Back the Pollinators Pledge encourages ordinary people to reduce pesticide use, plant flowers for bees and butterflies, and create a dialogue in their own communities around pollinator conservation. The pollinator gardens they are creating in their own communities are being documented on a dynamic online map and displayed over the web as a growing nationwide network of pollinator corridors. To date, nearly 4,000 people from all fifty U.S. states and around the world have taken the pledge, which states:

To bring back the pollinators, I will:

1. Grow a variety of pollinator-friendly flowers which bloom from spring through fall,
2. Protect and provide bee nest sites and caterpillar host plants,
3. Avoid using pesticides, especially insecticides, and
4. Talk to my neighbors about the importance of pollinators and protecting their habitat!

Partnering with Whole Foods Market to Share the Buzz

Every year since 2012, we have partnered with Whole Foods Market to promote pollinators, first through the Share the Buzz Campaign (2012-2014) and then through Party for the Pollinators (2015). These public awareness campaignsn exposed hundreds of thousands of Whole Foods customers to web-based public service announcements and in-store signage about pollinator conservation, and educated WFM vendors through workshops. After three years of running the campaign in June, 2015's events took place during April, so that the message of pollinator conservation could be part of Earth Day celebrations.

Informing Consumers and Incentivizing Farmers

In 2014, Whole Foods Market launched its Responsibly Grown™ produce program, which includes criteria for pollinator protection. We helped Whole Foods Market develop a comprehensive pest management framework that prohibits the world's most harmful pesticides from entering the Whole Foods Market produce supply chain, and we worked with them to create a robust set of standards for the protection of pollinators and biodiversity. All produce in Whole Foods Market stores now receives a "Good," "Better," or "Best" rating that helps customers make informed choices and selectively rewards those farms that are doing the most for pollinator protection. Since the launch of the program, farmers in California, Iowa, New Jersey, Texas, Mexico, and elsewhere have contacted us, requesting advice on how they can improve their farms for bees and increase their Responsibly Grown™ ranking. This program is a powerful example of how consumer education can help spark a shift in agricultural practices.

Sunflowers provide late season forage for pollinators like this sweat bee. Photo: Nancy Lee Adamson, The Xerces Society.

Policy

Every level of government—federal, state, or local—has the ability to guide invertebrate conservation, and at the Xerces Society, we see government agencies as necessary partners in our work. We seek to collaborate whenever possible, but when necessary, we aren't afraid to ask government agencies to step up and fulfill their responsibilities to protect animals and their habitats.

Leveraging White House Attention to Achieve Conservation Gains

There was an unparalleled level of interest and action from the federal government on pollinator issues in 2014—with Xerces ideally positioned to have a meaningful impact. In June 2014, President Obama released to the heads of federal agencies a memorandum titled "Creating a Federal Strategy to Promote the Health of Honey Bees and Other Pollinators." The memorandum incorporates many of the recommendations we presented to the president earlier in the year, and the memorandum specifically mentions native bees and monarch butterflies. Following on the president's charge to create conservation strategies, numerous agencies including the U.S. Department of Agriculture, U.S. Forest Service, U.S. Fish and Wildlife Service, National Park Service, and the U.S. State Department have continued reaching out to Xerces for guidance, technical support, and pollinator expertise. The U.S. Fish and Wildlife Service alone has committed to restoring 1.5 million acres of monarch butterfly habitat, and we are providing guidance on ensuring the long-term sustainability of this habitat.

Xerces Society Executive Director Scott Hoffman Black speaks at a United States Senate briefing in March 2013. Photo: The Xerces Society.

Extending Our Reach Internationally

Monarch butterflies and their remarkable migration are a North American phenomenon, and conserving this iconic pollinator requires international collaboration. We are working to engage the governments of the U.S. and Mexico in monarch conservation. At the invitation of the Mexican government and the World Wildlife Fund Mexico, we gave a presentation in the fall of 2014 on monarchs in Valle de Bravo, Mexico, at the 2nd Symposium for Research and Conservation of the Monarch Butterfly. As an ex officio member of the Federal Monarch Butterfly High Level Working Group, Executive Director Scott Black was invited to attend the 20th Annual Meeting of the Canada/Mexico/U.S. Trilateral Committee for Wildlife and Ecosystem Conservation and Management, and monarchs were a main agenda item at this meeting held in February 2015.

Invoking the Endangered Species Act to Protect Pollinators

One of the most important conservation tools available to us is the Endangered Species Act (ESA). In 2014,

we worked with other conservation organizations and a noted monarch scientist to submit a petition to list the monarch butterfly under the ESA. Based on the petition, the U.S. Fish and Wildlife Service has found that ESA protection may be warranted for monarch butterflies. The agency will now conduct a one-year status review on monarchs, which have declined by 90 percent in the past 20 years. This petition helped lead to today's unprecedented conservation efforts for the species.

Over the last several years, we completed and filed scientific petitions presenting substantial information that Franklin's bumble bee and the rusty patched bumble bee warranted being listed as endangered under the ESA. In 2014, after more than one year from the date we submitted the rusty patched bumble bee petition, we filed a complaint against the Fish and Wildlife Service for their failure to respond to the petition within the time frame required by law. If protection is granted, the bee's habitat will be protected and a recovery plan will be developed.

Making Pollinators a Priority for Federal and State Agencies

Thanks to our outreach to more than 100 wildlife professionals at the U.S. Forest Service and state wildlife agencies, we can report that 25 states have added or will add imperiled bumble bee species to their lists of Species of Greatest Conservation Need and include them in their State Wildlife Action Plans. These listings make it possible for bumble bee researchers and advocates to obtain State Wildlife Grants for research and conservation projects related to the listed species. The U.S. Forest Service has also listed the western bumble bee as a "sensitive species" in Oregon, California, and Washington, which means the western bumble bee must now be considered in Forest Service projects that require Environmental Assessments.

The once common Western bumble bee (*Bombus occidentalis*) foraging on *Angelica* sp. Photo: Rich Hatfield, The Xerces Society.

Advocating for Legal Protection for Pollinators

Saving America's Pollinators Act

In 2013, we worked with Representative Earl Blumenauer (D-OR) to draft the Saving America's

Pollinators Act, calling on the EPA to halt the use of the four most toxic neonicotinoids for uses that could significantly impact pollinators until additional research demonstrates that they can be used safely. On March 4, 2015, Representative Earl Blumenauer and Representative John Conyers (D-Mich) reintroduced the act, urging their colleagues to take swift action to protect these animals. Note: no foundation funding is used for lobbying purposes.

Regulations on Use and Transport of Commercial Bumble Bees

Commercially produced bumble bees are widely used to pollinate greenhouse tomatoes and other open-field crops. Exotic diseases from these managed bees pose one of the greatest threats to the health of wild bumble bees. The dramatic decline of many North American species is thought to have been caused by diseases from commercial bumble bees. Despite this threat, the commercial bumble bee industry is rapidly expanding and remains largely unregulated. To counteract this trend, we have been advocating for better regulation of the commercial bumble bee industry for many years, by reaching out to the USDA's Animal and Plant Health Inspection Service (APHIS) and state agencies with similar responsibilities. We exchanged numerous letters with the USDA and APHIS about this issue in 2014. We are hopeful that this agency and its state-level counterparts are ready to take steps soon to protect endangered pollinators. We plan to continue working with the USDA and APHIS to help draft, establish, and implement regulations that will protect wild bumble bees from diseases that commercial bumble bees harbor.

Linking Pesticide Research and Policy Change

Xerces is a trusted conduit between the world's leading pollinator researchers and a diverse set of stakeholders that includes farmers, gardeners, government agency staff, and policymakers. We translate the latest pesticide research into easy-to-understand ways for each of these groups to protect pollinators. In 2014, the U.S. Environmental Protection Agency released an analysis of soybean seeds that are coated with neonicotinoid pesticides; this analysis referenced almost all of the research papers that were summarized in our publication *Beyond the Birds and the Bees* that pertain to seed coating and soybeans. The EPA has committed to performing an environmental review of neonicotinoids by late 2018, and their apparent use of our materials is a positive sign.

Building a Scientific Case for Pollinator Protection

Two Xerces reports, among the most comprehensive available on neonicotinoids and pollinators, are changing the debate about these systemic, persistent insecticides. *Are Neonicotinoids Killing Bees?* and *Beyond the Birds and the Bees* are both increasingly used by policymakers and government agency staff to guide recommendations on pollinator protection.

In 2015, we initiated an ongoing revision of *Are Neonicotinoids Killing Bees?* to reflect new research. In this process, we have noted that, to a large extent, from 2013 forward studies are designed to address specific issues that Xerces raised in the first edition of *Are Neonicotinoids Killing Bees?* We'll likely never know if the researchers got their design ideas from reading our report, but clearly the messages that Xerces raised were valid and likely helped prompt better research.

Collaborating to Assess and Address Pesticide Risks and Policy Gaps

For several years, we collaborated with researchers and regulators from both Europe and the United States to design a new pesticide risk assessment process for bee protection. In the past, the risk assessment process was largely influenced by the chemical companies. To remedy this, we fought for the inclusion of ourselves and other science-based conservation stakeholders in the initial EPA discussions around a possible change

in the risk assessment process. *Guidance for Assessing Pesticide Risks to Bees*, which the EPA adopted in June 2014, improves the type of data that will be used in risk assessments. The new guidelines are much stronger than EPA's previously approved protocol, and the Xerces Society's role in the process is evident in the final document.

Further demonstrating the ripple effect of our work on risk assessment, state pesticide regulators also seem more aware of the issues of native bees because of Xerces. To date, the effect of Xerces on state regulation is clear in Oregon and Minnesota. Internationally, starting in the fall of 2014, new efforts are underway in Europe to incorporate bumble bees and solitary bees into pesticide risk assessment. It will be many years before protocols are clearly established and adopted, but the trend started with our work to include native bees in the EPA's new pollinator risk assessment protocols.

Xerces Pesticide Program Coordinator Aimee Code testifies at the Portland City Council's hearing on neonicotinoids in March 2015. Photo: Margo Conner, The Xerces Society.

Supporting Pesticide Bans Throughout the Country

Concerned citizens and progressive agencies turned to the Xerces Society for help as they pursue at the state and local levels policies to reduce use of pesticides, especially neonicotinoids. During the grant period, we provided guidance to efforts seeking pesticide bans at the state, county, and local levels. Efforts in Eugene, Oregon; Reno, Nevada; Seattle, Washington; Shorewood, Minnesota; Stillwater, Minnesota; Spokane, Washington; Portland, Oregon; Boulder, Colorado; Encinitas, California; and Thurston County, Washington, have already successfully limited pesticide use. Xerces is currently supporting local efforts in Montgomery County, Maryland; Oakland, California; Tucson, Arizona; and Vancouver, Washington.

Working Close to Home: A Spotlight on Oregon Legislation

Because the Xerces Society is headquartered in Oregon, we have deep engagement with policy issues in the state. Happily, we can report success on several fronts right in our backyard, in addition to the neonicotinoid ban in Portland noted above. Note: No foundation funding is used for lobbying purposes.

- Oregon House Bill 4139, enacted into law on March 6, 2014, requires education and testing on pollinator protection as part of the State's pesticide applicator licensing procedures. The law also created a task force to look into potential legislation and/or other remedies to better protect pollinators from neonicotinoid pesticides. As a member of the Oregon Task Force on Pollinator Health, the Xerces Pesticide Program Coordinator also helped prompt four bills at the Oregon Legislature. While focused on voluntary changes, these bills begin to respond to the multiple risk factors pollinators face. They include a bill to create a bee health diagnostic facility that could help test for pesticide poisonings, and identify and respond to disease and parasite issues. It would also fund an outreach and education effort to help better inform the general public and licensed applicators of how to protect pollinators from pesticides, and prompt the state to create best management practices to help raise awareness about a variety of pollinator-friendly actions.
- When Oregon State Representative Paul Holvey decided to seek a statewide ban on the four neonicotinoids that Xerces is most concerned about, he came directly to the Xerces Society to gather information on the chemicals and their potential risk to a variety of wildlife species. Xerces staff provided testimony to the state legislature on neonicotinoids in order to inform decision makers and help advance the conversation on possible actions to better protect pollinators and other wildlife from these long-lived highly toxic insecticides.

Preventing Mass Die-Offs of Bumble Bees

After seven documented mass die-offs of native bumble bees in Oregon during 2013 and 2014 related to treatment of *Tilia* (also known as linden or basswood) trees with neonicotinoids, Xerces led a successful effort to prompt the state of Oregon to prohibit all uses of clothianidin, dinotefuran, imidacloprid and thiamethoxam on trees in the *Tilia* genus. From start to finish, Xerces helped ensure the state of Oregon took strong actions to avoid any further acute bumble bee poisonings from neonicotinoid use on *Tilia* trees.

Our effort began in June 2014 when we, as a member of the Oregon Task Force on Pollinator Health, recommended this rule change. From there, we advocated for this change with the Oregon Department of Agriculture (ODA), raised awareness among the stakeholder community, and finally when ODA proposed our rule change suggestion, we submitted substantive comments. On February 27, 2015, in the face of industry opposition, ODA finalized the rule.

When Xerces reached out to ODA staff to thank them for the new rule we received the response: "You were the one who made the recommendation in the report, so you also played a large role." This new rule will go a long way to prevent future mass die-offs of native bumble bees similar to the seven recent incidents documented in Oregon after *Tilia* trees were treated with neonicotinoids.

Evaluation

We use multiple types of evaluation to assess our impact and our success. When testing and refining habitat installation and maintenance techniques, we often work with academic researchers who are applying standardized protocols that allow for objective assessment of results. (These partnerships with researchers often lead to articles in scientific journals, providing a layer of peer review as evaluation as well as a method for disseminating results.) For all of our trainings and educational events, we distribute a standardized evaluation form that helps us assess the effectiveness of our materials; for short courses, we also conduct a one-year follow-up survey to gauge participants' adoption of course topics and techniques.

With all of our work, we fine-tune our approaches and priorities on an ongoing basis. We assess our effectiveness internally and rely on input from our many partners.

Looking Ahead

In 2015 and beyond, the Xerces Society will leverage both the nation's focus on pollinators and our reputation to continue making pollinator conservation a mainstream practice. In many ways, our actions will be shaped by recent federal commitments to pollinator conservation.

In May 2015, the White House released the National Strategy to Promote the Health of Honey Bees and Other Pollinators, with three overarching goals: increasing monarch populations to 225 million, adding 7 million acres of pollinator habitat, and reducing honey bee hive losses. The Xerces Society applauds this effort and hopes it will lead to better habitat protection and management as well as better regulation of pesticides.

Amid the energy and excitement that comes from federal initiatives, the Xerces Society remains focused on achieving on-the-ground results that are informed by science and are directed at long-term solutions. Our current efforts consist of the following:

- Our monarch conservation team expanded this year when we hired a new monarch conservation biologist to work full-time with the U.S. Fish and Wildlife Service on the conservation of monarch butterflies and milkweeds in the Pacific Northwest.
- A team of our pollinator specialists is also working jointly with the USDA Natural Resources Conservation Service to provide technical support and training to NRCS staff nationwide as the agency implements the federal strategy.
- Executive Director Scott Black continues to participate in the Federal Monarch Butterfly High Level Working Group and the Canada/Mexico/U.S. Trilateral Committee for Wildlife and Ecosystem Conservation and Management, which made monarchs a main agenda item at the trilateral committee's meeting in February 2015.
- We are collaborating with scientists at universities and federal agencies, including the U.S. Geological Survey and U.S. Fish and Wildlife Service, to develop models that focus habitat restoration efforts where they will have the greatest impact. We also conduct applied research to better understand how to restore and manage monarch habitat.
- In partnership with the Monarch Joint Venture, USDA Natural Resources Conservation Service, U.S.

Forest Service, and U.S. Fish and Wildlife Service, as well as multiple state agencies and nonprofits, we are developing habitat management strategies and sources of milkweed seed (the caterpillar food plant for monarch butterflies), so that we can directly protect and restore critical habitat for the monarch.

The generous support of private foundations, government agencies, businesses, and committed individuals is instrumental in our success. Several of our federal awards require a 1:1 match with non-federal dollars, allowing us to double the impact of private support. Thank you for joining us in the Bring Back the Pollinators campaign.

Our Partnerships

There are many organizations and scientists with whom we partner on a regular basis. These include scientists from Rutgers University, Penn State University, University of California (at both Berkeley and Davis), University of Minnesota, Michigan State University, University of Massachusetts, University of Florida, Simon Fraser University, Oregon State University, San Francisco State University, Cornell University, staff from the USDA Natural Resources Conservation Service and Soil and Water Conservation Districts, Monarch Joint Venture, apple and cranberry growers associations, the National Organic Tree Fruit Growers Association, the Midwest Organic and Sustainable Education Service, National Sustainable Agriculture Coalition, the Organic Farming Research Foundation, Oregon Tilth, Great River Greening, Wild Farm Alliance, California Association with Family Farmers, and the Atlanta Botanic Garden, among many others.

We also work with a broad coalition of more than forty businesses and brands to make pollinator conservation an increasingly mainstream practice. These businesses encompass a diverse set of organic, natural, and sustainability leaders, including High Mowing Seeds, Endangered Species Chocolate, Cascadian Farm, Annie's Homegrown, and many more.

Pollinator Program Supporters

The Xerces Society gives our thanks for the support and partnership we receive from many organizations and businesses, as well as from our members. We are especially appreciative of the significant support for our pollinator conservation program provided by the following:

Government Agencies and Nonprofits

- Food and Agriculture Organization of the United Nations
- Great River Greening
- International Union for Conservation of Nature
- Iowa Department of Transportation Living Roadway Trust Fund
- Kerr Center for Sustainable Agriculture
- The Monarch Joint Venture
- NatureServe
- Northeast Sustainable Agriculture Research and Education
- Northwest Center for Alternatives to Pesticides
- Placer County Resource Conservation District
- Port of Portland
- Southern Sustainable Agriculture Research and Education
- U.S. Department of Agriculture Forest Service
- U.S. Department of Agriculture National Institute of Food and Agriculture
- U.S. Department of Agriculture Natural Resources Conservation Service
- U.S. Department of the Interior Fish and Wildlife Service
- Western Sustainable Agriculture Research and Education
- Wildlife Preservation Canada

Corporate

- Aveda
- Cascadian Farm
- Cell Signaling Technology
- Chantecaille
- Cheerios
- Crofters Foods Ltd.
- Endangered Species Chocolate, LLC
- General Mills
- Haagen-Dazs
- ICF International
- J.Crew
- Madhava Natural Sweeteners
- Maisie Jane's California Sunshine Products, Inc.
- Nature Valley
- Suja Juice
- Whole Foods Market
- Zerene Systems LLC

Foundations

- Alice C. Tyler Perpetual Trust
- Audrey & J.J. Martindale Foundation
- The Bay and Paul Foundations
- Ceres Trust
- Charlotte Y. Martin Foundation
- CS Fund
- Disney Worldwide Conservation Fund
- Duke Farms Foundation
- The Dudley Foundation
- The Edward Gorey Charitable Trust
- The Elizabeth Ordway Dunn Foundation
- Farnley Tyas Foundation
- Gaia Fund
- Hind Foundation
- Horne Family Foundation
- Irwin Andrew Porter Foundation
- Maki Foundation
- Metabolic Studio
- The New-Land Foundation, Inc.
- Orange County Community Foundation
- Sarah K. de Coizart Article TENTH Perpetual Charitable Trust
- Swimmer Family Foundation
- Turner Foundation, Inc.
- The White Pine Fund
- Whole Systems Foundation

Whole Foods Market's Party for the Pollinators

Since 2012, Whole Foods Market and its vendor companies have hosted annual pollinator-themed initiatives. These bee conservation and awareness events have helped thousands of people learn about pollinators and how everyone can help protect these animals. The Xerces Society is grateful for the generous support from these participating partners.

2015 Party for the Pollinators Partners

- Whole Foods Market
- Blue Diamond Almond Breeze Almond Milk
- Cascadian Farm

2014 Share the Buzz Partners

- Whole Foods Market
- Acure Organics
- Annie's
- Attune Foods
- Aura Cacia
- Barney Butter
- Big Dipper Wax Works
- Blue Diamond Almond Breeze Almond Milk
- Blue Diamond Nut Thins
- Boiron
- Burt's Bees
- Cascadian Farm
- Celestial Seasonings
- Dream
- Evolution Fresh
- Justin's
- Luna Bars
- Maisie Jane's California Sunshine Products, Inc.
- MaraNatha
- Mediterranean Snacks
- Mrs. Meyers Clean Day
- Talenti
- TERRA Chips
- The Greek Gods Yogurt

The Xerces Society
for invertebrate conservation

Protecting the life that sustains us

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