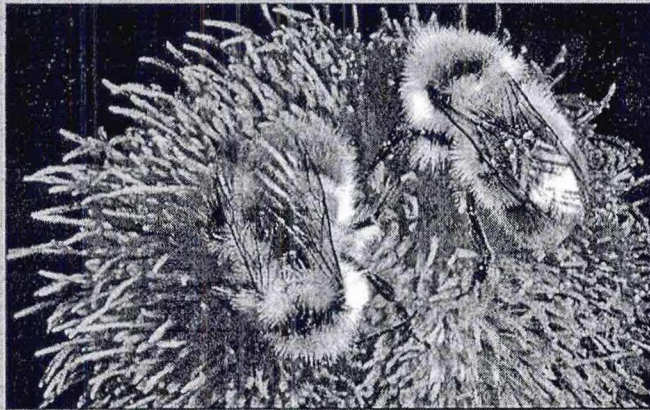


Report to Metro Parks and Greenspaces and U.S. Fish and Wildlife Service on  
Greenspaces Environmental Education Grant Number 923604

The Xerces Society's  
**Pollinator Conservation Handbook**

*A Guide to Understanding, Protecting,  
And Providing Habitat for Native Pollinator Insects*



**POLLINATOR  
CONSERVATION  
HANDBOOK**

The Xerces Society  
In Association with The Bee Works

*Featuring Photographs by Dr. Edward S. Ross*

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## Introduction

The primary objective of this grant was to support production of the *Pollinator Conservation Handbook: A guide to understanding, protecting, and providing habitat for native pollinators*. Full of practical information, the *Handbook* guides people through the steps of planning and implementing habitat improvements for pollinators in all situations, from backyards to natural areas. The main focus of the *Handbook* is native bees—the most important group of pollinators—but it also covers the needs of other pollinator insects, such as butterflies, flies, and beetles.

Pollinators are keystone species, providing a vital ecological service in both managed and wild ecosystems. They pollinate crops on farms and in backyards and maintain healthy wildland plant communities, which support much of the wildlife that enhances the fabric of our daily lives. Pollinators suffer from the same pressures as other wildlife, including facing habitat loss and modification due to commercial and residential development, intensified agriculture, pesticide use, and changes in land management.

Reducing the impact of these changes by protecting, managing, and creating pollinator habitat can readily occur at a grassroots level in both urban and rural areas. Areas of greenspace both small and large—such backyards, planting strips, riparian areas, school grounds, field margins, parks and wild areas—easily can be enhanced for pollinators. Together these areas create a mosaic of habitat to support healthy pollinator populations. There has been little easily accessible information to provide people with the information and skills needed to create pollinator habitat. The *Pollinator Conservation Handbook*, produced with support from this grant, fills this gap.

Written for the general audience, the *Pollinator Conservation Handbook: A guide to understanding, protecting, and providing habitat for native pollinators* is a tool kit that can be used by gardeners, teachers, city park managers, farmers, and wildland managers. Intended to be a working reference rather than a coffee table volume, the *Handbook* is designed to fit in a pocket and be convenient to carry into the field.

## Project Activities

The principal activities of this project can be divided into six stages:

1. Developing the book outline.
2. Research and information gathering.
3. Preparation of the text, including drafting, reviewing, and editing.
4. Gathering photos.
5. Design and printing.
6. Distribution.

The first five are complete. The final one, distribution, will be an on-going activity.

Developing the book outline. Preparing a detailed book outline was the first step in the project. The book outline fulfilled two purposes: 1) making sure that the *Handbook* would include the necessary information, and 2) assigning writing tasks to the authors. During this process, however, it became apparent that the *Handbook* would be



significantly longer than initially expected. The final *Handbook* is one hundred and sixty pages long, four times the original size. As the book grew, so did the project, and this is one of the major reasons for the delay in finishing.

The *Handbook* includes ten chapters and five appendices. Together, they give a background to pollination and pollinators, including the biology of native bees and other pollinator insects and the threats they face; detailed guidance on planning and implementing habitat projects for pollinators; extensive lists of other resources and suggestions for further reading; and activities to study these fascinating insects and observe their behaviors.

Research and information gathering. We spent significant time undertaking a review of existing literature and corresponding with scientists to ensure that the *Handbook* would contain accurate information reflecting the latest research. This process continued until the very last text draft.

Preparation of the text. The text went through many drafts and revisions. In addition to the authors' own reviews, scientists and others with expert knowledge reviewed the text for content. Separate sections were reviewed by Jim Cane (bees), Carol Kearns (flies), Jonathan Mawdsley (beetles), Bob Pyle (butterflies), and Lynn Wilson (education). The entire text was reviewed by Charles Michener, professor emeritus at the University of Kansas and one of the world's foremost bee scientists. Dr. Michener also honored us by writing the foreword.

As the *Handbook* grew, we realized that an external editor was required. Although two of the co-authors had extensive editing experience, we decided to assign this task to someone not so intimately involved with the book. As a result, Michele Glazer took on the role of editor, a job would eventually take more than seven months. Michele's careful editing ensured a uniform writing style throughout the book and provided input from a laypersons' view of a technical subject.

Gathering photos. The Xerces Society is very fortunate to have the support of many excellent photographers. For the *Handbook*, we were granted permission to use photos taken by Arthur Evans, David Inouye, and Jeff Owens, and some photos from the U.S. Department of Agriculture-Agricultural Research Service image library. In particular, Edward Ross, one of the United States' leading insect photographers, kindly allowed us to use many of his stunning images.

We also used the authors' photo libraries and visited local greenspaces and other locations, such as MAX embankments and development sites, to take additional photos to illustrate specific points covered by the text.

Design and printing. John Laursen of Press-22 was responsible for the book design and for overseeing printing and binding. Based in Portland, John is an award-winning designer who has been producing the Xerces Society's magazine, *Wings*, since 1987. John's involvement in this project not only ensured that the book is of the highest quality



but also, as a consequence of his friendship and flexibility, led to significant cost savings. Local companies did the printing and binding. The final print run was of five thousand copies.

Distribution. Even before publication, there was considerable interest in the *Handbook*. This was in a large part due to the fact that there is no similar book and that there is a growing desire to take action to help pollinators. Now that the *Handbook* is published, we must ensure that it reaches the hands of people who can and will use it.

The *Handbook* will become an integral part of the activities of the Xerces Society's Pollinator Conservation Program. We will use it as a training resource when we present workshops; a resource for schools, garden clubs, and others when we provide technical assistance; and in our education and interpretive activities.

Since the *Handbook* is written for a national audience, we are promoting it beyond the Portland/Vancouver area through listservs, conservation organizations, networks of scientists and land managers, and to gardening magazines with whom we have worked in the past year, such as *Horticulture*, *Country Living Gardener*, and *American Gardener*. We are also promoting it directly to the Society's members and received pre-publication orders for nearly four hundred copies.

## **The Authors**

The *Handbook* was originally to have two authors, Stephen Buchmann and Matthew Shepherd. Two Xerces Society staff—Mace Vaughan and Scott Hoffman Black—reviewed text drafts. Their contributions as reviewers became so significant that it was only fair that these efforts were properly recognized; thus, they became co-authors.

- Stephen L. Buchmann is a widely published bee scientist and conservationist. He co-founded the Forgotten Pollinators campaign and is founder and president of The Bee Works, a Tucson, Arizona-based consulting company that specializes in pollinators.
- Matthew Shepherd has led community-based conservation programs, has experience of habitat creation and management, and has developed education activities. He heads the Xerces Society's pollinator program and edits our magazine, *Wings*.
- Mace Vaughan has extensive research and teaching experience on insect behavior and population biology. Mace has also wrangled insects for two television documentaries. He is the staff entomologist at the Xerces Society.
- Scott Hoffman Black, an ecologist with experience protecting vulnerable species and their habitats, is executive director of the Xerces Society. He has worked as a researcher, conservationist, and teacher and has written for many publications.

## **Hurdles and Hiccups**

We wish we could say that production of the *Handbook* had progressed strictly according to the proposed timeline. However, as is the nature of publishing projects, there was slippage. This was due to two principal reasons.

First, despite the early discussions and planning, work on writing the text did not start on time. This is partly due to one of the co-authors living in Tucson—whip-cracking over a



long distance is inevitably more difficult!—and partly because of the pressure on Xerces staff of other, sometimes more-urgent tasks.

The second was that the *Handbook* grew from forty pages to one hundred and sixty pages. This meant that significantly more time was required for writing and production and led to the need for an external editor, adding an additional step into the process. Could we have limited ourselves to the original size of forty pages? Probably, but we would have finished with an inferior product with which none of us would have been happy. The growth of the *Handbook* enabled us to produce a significantly more useful book that will remain valuable for many years.

### **Budget**

The final cost to the Xerces Society to produce the *Pollinator Conservation Handbook* was \$80,564. This figure does not include an in-kind donation from Steve Buchmann for his assistance in writing the book, nor an in-kind donation of \$10,000 for assistance with editing. Grant income to offset these costs totals \$25,275, including the \$10,000 grant from Metro Greenspaces and U.S. Fish and Wildlife Service. The balance of the cost is taken from the Society's general fund, and will be recouped by sales of the *Handbook*.

Attached to this report is the grant claim with the necessary documentation.

### **Conclusions**

Our aim was to produce a practical guide to pollinator conservation that would include enough information to be useful without overwhelming the reader with unnecessary detail or technical language. After many changes and improvements, as well as significant hurdles, we have completed an excellent product thanks to the support of Metro and the USFWS through the Greenspaces Environmental Education program.

Copies of the *Handbook* have already been distributed, primarily to members who had preordered copies and who have been patiently waiting and to those who helped in its development. The response has been extremely positive, including:

"It's truly beautiful. I can't wait to read it."

Laurie Adams, Executive Director, Coevolution Institute.

"I like your emphasis on the positive, guiding the homeowner and citizen to do some good for bees (and gain an inadvertent, pleasant education to boot)."

James H. Cane, USDA-ARS Bee Biology and Systematics Lab.

"Everything about the book is excellent: the printing is very good, and it is well organized and readable."

Edward S. Ross, California Academy of Sciences.

"The *Handbook* is magnificent!"

Robert Michel Pyle, author and conservationist.