

**Conservation Matters:**  
**Contributions from the Conservation Committee**

# The Xerces Society: 36 Years of Butterfly Conservation

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In 1971 Robert Michael Pyle, a noted lepidopterist and author, conceived the idea for the Xerces Society while on the British Rail's main line between King's Cross and Huntingdon. He named the Society after the Xerces blue butterfly (*Glaucopsyche xerces*), which was driven extinct by the expansion of San Francisco in the early 1940's. The "X" of Xerces, he imagined, would make a perfect symbol for extinction.

The mission of the Xerces Society is to "protect wildlife through the conservation of invertebrates and their habitat". Since its inception, the Xerces Society has strived to use the best available scientific information to further the conservation of butterflies, moths, and many other insects and invertebrates. Over the past 36 years, the Society has protected many endangered invertebrates, worked with scientists and land managers to understand and manage habitat for these animals, and promoted the idea of conservation at the bottom of the food chain to a public otherwise focused on bald eagles and whales.

A concentration of the Xerces Society's work has been on endangered and threatened Lepidoptera. Many species of Lepidoptera are imperiled or at-risk in the United States and across the world. There are 22 butterflies and 2 moths listed as endangered or threatened under the US Endangered Species Act. Many of these species were listed under the direction of former

Xerces president Paul Opler, who was then working for the US Fish and Wildlife Service. In addition, according to the International Union for Conservation and Nature's Red Book of Swallowtails, 10% of swallowtail butterfly species are considered threatened. Swallowtails are the only group of insects that have been assessed worldwide.

Butterflies become endangered because of the same destructive forces facing many other animals. According to the IUCN, the leading causes of animal endangerment are habitat destruction, displacement by introduced species, and alteration of habitat by chemical pollutants such as pesticides. Many at-risk insects are threatened by more than one of these causes. The book *Precious Heritage; The Status of Biodiversity in the United States* notes that 33 butterflies are imperiled in the US, 97% of which are threatened by habitat loss, 36% by alien species, 24% by pollution, and 30% by over collecting.

To better understand issues relative to North America's most at-risk butterflies, the Xerces Society has produced a *Red List of Pollinator Insects of North America*. (Note: partial funding for this effort came from the Butterfly Conservation Initiative). The *Red List* is the most complete assessment of the status of the continent's at-risk pollinators, as well as the most comprehensive source of

information available on these insects.

Fifty seven butterflies and two moths are included on the list. For each, the Xerces Society has prepared a species profile that distills the current state of knowledge of life history, distribution, threats, and conservation and research needs. Each profile includes discussions of taxonomy and identification, as well as lists of contacts, publications, and relevant websites. Recovery plans for U.S. federally listed Lepidoptera and related documents are also included in each profile.

The *Red List* is available as a CD-ROM, and can also be accessed on-line at the Xerces Society's website ([http://www.xerces.org/Pollinator\\_Red\\_List](http://www.xerces.org/Pollinator_Red_List)). The Society is currently updating the *Red List*, and we invite experts to review current profiles.

The Xerces *Red List* shows that the most imperiled species are those that are highly specialized or restricted to a few small patches of habitat. Prairie obligate butterflies are a prime example; Karner blue (*Lycaeides melissa samuelis*), Laguna Mountain skipper (*Pyrgus ruralis lagunae*), and many other butterfly species require host plants that thrive in intact prairie and meadow systems.

Some species are very specialized. For instance, the plates that cover the shells of tortoises are made of keratin, a protein few scavengers can digest.

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**1)** Taylor's checkerspot butterfly (*Euphydryas editha taylori*) was previously documented at more than seventy sites in British Columbia, Washington, and Oregon. It now occurs at only fourteen sites, most of which contain fewer than fifty individuals. Photo by Dana Ross. **2)** (*Ceratophaga vicinella*), whose caterpillar specializes on a diet of dead gopher tortoise shells may be threatened by the loss of gopher tortoise habitat. Photo by Tom Eisner. **3)** In the state of Washington, over 95% of the native grassland that Mardon skippers (*Polites mardon*) depend upon has been lost. Photo by Norm Barrett.

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However, in Florida there is a rare moth, *Ceratophaga vicinella*, whose caterpillar specializes on a diet of dead gopher tortoise shells. Loss of the gopher tortoise's habitat may threaten this moth species.

Habitat loss is the primary cause of Lepidoptera endangerment. Perhaps the best known case of habitat loss leading to extinction is that of San Francisco, California, a city that now almost entirely covers what was once one of the major coastal dune ecosystems in western North America. Three dune butterflies, which were endemic to this region, are now extinct: *Cercyonis sthenele sthenele*; the Xerces blue (*Glaucopsyche xerces*); and *Plebeius icarioides pheres*. This dramatic decline in butterflies was documented in the article "San Francisco's Vanishing Butterflies" in the 1956 issue of *Lepidopterist's News*. Three other butterflies, Callippe Silverspot (*Speyeria callippe callippe*), San Bruno Elfin (*Callophrys mossi bayensis*), and Mission Blue (*Icaricia icarioides missionensis*), are now limited to the San Bruno Mountains just south of San Francisco, the last remnant of the San Francisco hills ecosystem.

Conversion of natural habitats for agriculture, particularly for planted food and fiber crops (e.g. cotton), is one of the most extensive land uses and, according to Robert Pyle, has resulted in the greatest loss of native insect populations.

The introduction of various exotic organisms, whether intentional or not, has affected native Lepidoptera both directly and indirectly. For example, introduced plants out-compete native plants that serve as hosts for lepidoptera.

Intentional introductions of non-native insects harm many native insect species. Over the past 50 years, non-native insects have been released to control a variety of non-native pest

insects. Although the damage to non-target native insects from these biological controls is rarely documented, some evidence is surfacing that their impact may be significant. For example, the parasitoid fly *Compsilura concinnata*, which was released repeatedly in North America from 1906 to 1986 as a biological control agent against several pests, including the introduced gypsy moth, has been implicated in the declines of four species of giant silk moths (Lepidoptera: Saturniidae) in New England. Another study in Hawaii found that 83% of parasitoids reared from native moths were formerly introduced biological control agents.

Pesticides and other pollutants are implicated in the decline of some Lepidoptera. Lights along streets and highways are implicated in losses of nocturnal insects, particularly large moths. Finally, scientists are beginning to understand the negative impact of climate destabilization (climate change). Climate destabilization will not lead to uniform change across the landscape. Some places will be hotter and dryer while some may be wetter, and in other places the weather may simply be more variable. It may effect plant communities and cause seasonal shifts that put species out of sync with their food sources. Data shows that some butterflies are shifting their range in response to the changing climate. It is also leading to the endangerment of Lepidoptera with specific, narrow habitat requirements. A changing climate is especially detrimental to species that cannot disperse, species like the Uncompahgre fritillary (*Boloria improba acrocneuma*), which is restricted to high mountain slopes in southern Colorado.

While the risks to Lepidoptera are severe, there are steps that one can take to protect these at-risk species. Ultimately, to protect any species one must protect its habitat. The Xerces Society works with land managers, municipalities, federal agencies, and local land owners to protect habitat for the most at-risk species. In Oregon,

Xerces is working to manage and protect two of the largest remaining populations of the Taylor's checkerspot butterfly (*Euphydryas editha taylori*). Taylor's checkerspot was previously documented at more than seventy sites in British Columbia, Washington, and Oregon. In the past 50 years, it has experienced a dramatic decline; it now occurs at only fourteen sites, most of which contain fewer than fifty individuals.

To protect this butterfly, Xerces staff are working with the Benton County Natural Areas and Parks Department, a private landowner, and the Bonneville Power Authority to control invasive weeds while still retaining the native prairie that support this butterfly. The Society is working with a coalition of state, federal, and private scientists and managers to help determine the best methods for managing sites across the range.

Another important factor in the recovery of these at-risk Lepidoptera is research. In order to manage habitat for these species, one must understand their biology, habitat requirements, and ecology. The Society is working with graduate student Loni Beyer and Washington State University professor Cheryl Shultz to understand the life history of the Mardon skipper (*Polites mardon*), a small, tawny-orange butterfly dependent upon native grasslands and mountain meadows. In the state of Washington, over 95% of the native grassland that Mardon skippers depend upon has been lost to agricultural and residential sprawl, and to the encroachment of conifers resulting from fire suppression. The grassland habitat that remains is often degraded by livestock grazing, recreational use, and introduction of exotic species.

In 2006, after several years of surveying for new sites, the Xerces Society embarked on a project to better understand this butterfly and its habitat needs. With funding from the Bureau of Land Management and the Forest Service, Xerces staff studied

skipper populations at sites in Oregon and Washington to identify the host plants utilized by the Mardon skippers. Xerces staff also conducted population censuses and recorded adult nectar usage. Results indicate that Mardon skippers use a wider variety of host plants than previously thought. We then returned to one site to find and study Mardon skipper caterpillars, something that had never been done before. Xerces staff were the first to actually observe these caterpillars in the wild. We are now working with federal agencies to develop a plan to assess the impact of cattle grazing on the Mardon skipper.

The Xerces Society works to empower young people to help us understand important issues related to Lepidoptera conservation. In 1999 the Society initiated the Joan Mosenthal DeWind Award to ensure that the next generation of Lepidoptera conservationists can continue to promote sound science-based conservation. A lifelong lover of butterflies, Joan Mosenthal DeWind was a pioneering member of the Xerces Society. In Joan's memory, her husband Bill DeWind established a student research endowment fund. Each year, the Xerces Society awards small grants to two or three students to support research that will advance the conservation of butterflies or moths. University students throughout the world apply for this award.

To conserve Lepidoptera, the general public, scientists, land managers, and conservationists need to understand the extraordinary value that these organisms provide. The Society works with people to take action to protect, understand, and enjoy these fascinating creatures. In 1990 we worked with the Smithsonian to produce the popular book *Butterfly Gardening*, and have since produced many easy-to-use publications on butterfly conservation. In the early days the Society produced the journal *Atala*, which was designed to include information on insect conservation. In 1987 *Wings* was launched as a full-color magazine. It has become a very popular tool for educating

Xerces' thousands of members, as well as others in the public.

One example of our outreach work is the California Monarch Conservation Campaign, which is managed by longtime Xerces volunteer Mia Monroe. This program provides training to citizen scientist monitors to complete Thanksgiving weekend counts of Monarchs at overwintering sites. This information is being used to track long term trends in population numbers at these sites.

Partnerships are vital to our conservation efforts. The Society works with scientists and land managers across the US on insect conservation issues. One very successful partnership has been with the Oregon Zoo in their efforts to captive rear at-risk butterflies. We are working with the Natural Resource Conservation Service and farmers across the US to promote pollinator conservation, and we believe that butterflies can be an important part of this outreach. The Xerces Society is engaging with other societies to reach out to new audiences. Later this year we will bring an insect conservation symposium to the annual meeting of the Entomological Society of America in San Diego, with the goal of engaging more entomologists in insect conservation.

The Xerces Society's latest campaign to capture the public's imagination will take place throughout 2008. Robert Michael Pyle will be undertaking a historic journey in hopes of finding and positively identifying as many species of butterflies as possible in the United

States and Canada. The culmination of this project will be a book entitled *Swallowtail Seasons: The First Butterfly Big Year*, published by the Houghton Mifflin Company.

While Bob Pyle will be seeking as many species of the nearly 800 recorded in North America north of Mexico, the numbers themselves will be secondary to his in-depth encounters with the butterfly fauna. His efforts will play a role in furthering butterfly conservation work, with the Xerces Society collecting pledge donations based on each species that he positively identifies. All proceeds from this Butterfly-A-Thon will directly benefit Xerces Society projects in rare butterfly conservation. To update Butterfly-A-Thon participants on Bob's progress, he will be sending regular updates from the road, which will be posted as a blog on the Xerces Society website.

The Xerces Society has worked for 36 years for the conservation of butterflies, moths, and other invertebrates. In the coming years, the Xerces Society will continue our efforts to educate the public, policy makers, scientists, and land managers about important issues related to Lepidoptera conservation. We hope to work with the Lepidopterists' Society Conservation Committee and others in the Lepidoptera community to further the goal of conserving Lepidoptera species across the continent.

For more information on Xerces Society programs, publications, and our Butterfly-A-Thon, please visit [www.xerces.org](http://www.xerces.org).

## Get in the Swing of Things with a Society T-Shirt!

High Quality, 100% cotton, generous length, pre-shrunk, proudly displaying a 7-inch (18cm) diameter Lepidopterists' Society logo on the front. Available in four adult sizes (small, medium, large and extra large) in either *Papilio glaucus* yellow (with black logo) or *Melanchroia chephise* (navy) blue (with white logo) for only \$10 each, plus postage (\$4 for first shirt, \$2 for each additional shirt within the U.S. or to Canada).

Please indicate quantity, color and size desired and send, along with your check drawn on a U.S. Bank, in U.S. funds, to:

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