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Butterflies and Moths of National Parks, State Parks, and National Wildlife Refuges

A Survey Reflects a Growing Interest in Managing for Lepidoptera

Photo by Don Riepe

Figure 1. Instantly recognizable, the tiger swallowtail nectars *at orange milkweed (butterfly weed), a prairie perennial that attracts many lepidoptera.*

By Don Riepe and Barbara Toborg

THE RECENT proliferation of butterfly field guides and gardening books, butterfly farms and observatories, and the formation of the North American Butterfly Association, attests to an increasing public interest in the study and enjoyment of *lepidoptera* (butterflies and moths). Because they can live in relatively small habitats, butterflies and moths make ideal subjects for "watchable wildlife" and other environmental education programs–even in heavily urbanized areas. Butterflies add color and movement to the landscape and have an aesthetic appeal to many visitors. Some, such as the monarch butterfly, migrate by the millions across the lower 48 states on their annual journey to southern California, Texas, and Mexico. A group entitled "Friends of the Monarchs" monitors the monarchs as they winter at Pacific Grove, California. Last winter (1995-96), upwards of 50,000 monarchs delighted visitors from all over California, nearby states and Hawaii, including tourists from France and Switzerland.

As plant pollinators (figure 1), lepidoptera play an important role in natural ecosystems. Many species serve as indicator species or environmental "barometers" whose presence or absence tells us something about the state of an environment. As components of food chains and webs, lepidoptera (especially caterpillars) provide sustenance for small mammals and many species of birds, especially during nesting and migration periods when food demand is high. Among the million plus insects presently described, butterflies and moths are perhaps the most well known and best loved. Therefore, from a public agency perspective, lepidoptera make ideal subjects to consider in resource management and landscaping plans and for interpretive programs.

Natural Areas Surveyed

In order to get some general overview of the current status of interest and management concern regarding lepidoptera in park systems in the United States, we developed

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PHOTO BY DON RIEPE

Figure 2. A question mark butterfly feeds on "bait," a mixture of beer, molasses, and rotting fruit. Baiting is used to inventory shy, woodland species.

a simple questionnaire and sent it to various federal and state parks and wildlife refuges, 463 areas in all. Circulation was subjective, but was based on natural area management relevance (i.e., national historic sites, monuments, etc., were generally omitted as were refuges concerned mostly with fisheries management). This is not to suggest that these areas have no interest in lepidoptera; to the contrary, many smaller parks with limited natural resources can be enhanced by considering butterflies and moths in landscaping designs. The public will also appreciate these enhancements.

A total of 260 parks and refuges responded for an overall 56% return rate. The breakdown is as follows: national parks–64% (80 returns from 122 parks); national wildlife refuges–58% (104 returns from 177 refuges); state parks–46% (76 returns from 164 state parks). The higher percentage of return from the national parks is possibly related to the questionnaire being generated from within the National Park Service. The lower return rate from state parks may relate to their mandate for a more active role in recreation or to fewer biologists (naturalists) on staff than federal agencies. Interestingly, however, 24 (30%) of the responding state parks had active management plans for encouraging or enhancing species of lepidoptera.

We asked whether the natural area had developed a checklist or conducted any inventory of lepidoptera, had exhibits or displays, conducted research or studies, had any threatened or endangered species, or actively managed habitats for any species of butterfly or moth. The response was generally positive: Eighty (30%) areas had (or were working on) an inventory or checklist of lepidoptera. Forty-seven (18%) actively managed parks to encourage, enhance, or restore lepidoptera. Twenty-two (8%) had federal or state threatened or endangered species. Forty-four (16%) had exhibits or displays highlighting lepidoptera and 84 (32%) had studies (past or ongoing) conducted in a park or refuge. Forty-seven (18%) respondents wrote comments on the back of the questionnaire stating an interest in or desire for more information about butterfly and moth species. Seventy-three (28%) sent enclosures with the questionnaire, which consisted of checklists, partial inventories, endangered species studies, and pest management plans.

> *One respondent stated, "It is encouraging . . . that you are considering . . . a group of wildlife species that has not been at the center of attention in the past."*

Discussion

While the response was generally positive, a significant percentage of federal and state parks and refuges appeared to know relatively little about the lepidoptera in their areas. Many parks were concerned about pest species such as gypsy moths; some managed passively for lepidoptera (i.e., as a by-product of prescribed burns, or restoring native prairie grasslands); other parks responded solely to endangered species management mandates for such species as the Karner blue, Schaus' swallowtail, Myrtle's silverspot, or regal fritillary to name a few. Two parks were concerned about illegal collecting. Eighteen areas (especially state parks) reported planting butterfly gardens. While 80 (30%) respondents reported having a checklist or inventory, many were considered partial, having been based on cursory surveys or small collections. Others reported that they were "thinking of doing it," had a survey "in progress," or "anticipate [doing] one."

While some parks had an interest in generating an inventory, they cited lack of funds to initiate one. Perhaps other groups (e.g., butterfly or bird clubs, Audubon Society chapters, The Nature Conservancy) would be able to assist with this undertaking. Donation boxes

Figure 3. A mowing plan that allows weedy edges to grow each year benefits lepidoptera. Purple gerardia is the host plant for the common buckeye butterfly.

Figure 4. Bumblebee moth (Haemorrhagia axillaris), *a diurnal species, routinely feeds at butterfly bush* (Buddleia).

Figure 5. Woodpiles provide winter habitat for the mourning cloak, questionmark, and several other species that overwinter in the adult life stage. Herptiles, small mammals, and other wildlife also benefit.

placed at visitor centers could bring in additional funds to support such programs.

The many local garden clubs may be willing to help defray expenses and provide volunteers to care for planted areas such as butterfly gardens or open field management zones. Also, state funds may be available, generated by income tax check-offs or special license plate fees set aside for nongame management programs. Volunteers may also be gleaned from contacting national groups such as the North American Butterfly Association, The Xerces Society, or The Lepidopterists' Society.

At Gateway National Recreation Area, volunteers from the New York City Butterfly Club have spent many hours in the field over a 10-year period and provided us with a complete inventory of butterflies (70 species) along with a fair representation of moths (227 species). Moths constitute a much more diverse and difficult-to-identify group, usually outnumbering butterfly species ten times. By this formula we have probably identified less than half the number of species present.

Inventorying Lepidoptera

Maintaining open fields or planting patches of milkweeds and other wildflowers will concentrate lepidoptera and reduce the need to go far afield to survey them. Shy, woodland species can be attracted to bait by smearing rotting fruit on bark (figure 2). This works especially well for many species of moths. We use a fancy mixture of fruit, molasses, and stale beer, but an old banana will suffice (why waste beer?). As many species of butterflies are attracted to specific larval host plants, knowledge of these plants should afford a clue to the presence or absence of species. Since many butterfly species are short-lived as adults (2-3 weeks), knowledge of their emergence is paramount, too, as you may have only a brief window of opportunity to see flying individuals. While monarchs, question marks, red admirals and others migrate southward in August and September (especially along coastal beaches), other species such as painted ladies, cloudless sulphurs, and variegated fritillaries are still emigrating northward. This flux of movements provides the opportunity to find additional species in parks during all seasons except winter (in the north).

As for the question relating to past or ongoing studies, 84 parks (32%) responded favorably, although many were in planning, proposal, or "hope to" stages. Some were part of regional or

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state surveys while others were related to tagging or counting monarchs during migration.

Of Money and Moths

In a time of declining budgets, management strategies for butterflies and other insects can be relatively cost effective. Some parks spend many hours maintaining acres of lawn. By allowing some areas to grow into "butterfly gardens" (i.e., fields of wildflowers), managers can save money by mowing once or twice yearly instead of every 2-3 weeks during the growing season. Unmowed areas could be edged (mowed a few feet just off roadways) or sculpted into patterns to give them a "managed" or aesthetic look (figure 3). Mowed trails within these fields would provide easy access for visitors and interpretive programs. Landscaping around buildings with flowering plants will enhance aesthetic appeal while providing a nectar source for butterflies and hummingbirds. We have found the best attractant to be butterfly bush *(Buddleia davidi)* (figure 4). However, it is an exotic and you may want to stick with native species. Many butterfly gardening books are currently available for helping with selections (see references at end).

At Gateway, we have been actively enhancing habitat for lepidoptera for the past 10 years. In many cases it has been as simple as not mowing, mowing less frequently, creatively mowing to leave more weedy edges or patches, planting a few host plant species such as hackberry *(Celtis* spp.) or willows (*Salix* spp.), providing overwintering cover (log piles [figure 5, previous page]) and planting native wildflowers and shrubs as nectar sources. If possible, plantings should be chosen to bloom at various times during the growing season and provide food for larvae. Some knowledge of lepidopteran species present will help guide you in plant selections.

In our experience, managing for lepidoptera has proven to be enjoyable and rewarding for staff, volunteers, and visitors. We hope that this simple questionnaire has spurred some interest in other parks and that we can form a network of communication regarding management concerns and ideas.

Butterflies and moths are ideal subjects for interpretive programs and resource management and landscaping plans.

Obtaining Further Information

If you would like a copy of the questionnaire, a list of references, a butterfly brochure entitled "Butterflies of Jamaica Bay" or have any general questions write: Don Riepe, Gateway National Recreation Area-Wildlife Refuge; Floyd Bennett Field; Brooklyn, NY 11234. By E-mail contact barbara_toborg@nps.gov. For information about butterfly groups and July 4th censuses in your area contact the North American Butterfly Association; 4 Delaware Road; Morristown, NJ 07960; (201) 285-0907. On the Internet you can join a lepidoptera discussion group by sending an e-mail message addressed to: LISTSERV@YALEVM.CIS.YALE.EDU. The message should read: SUBSCRIBE LEPS-L [your name, not in brackets]. You can also access LEPS-L as a newsgroup through sci.bio.entomology.lepidoptera.

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