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BOOK REVIEW

CONSERVATION BIOLOGY OF LYCAENIDAE (BUTTERFLIES)

edited by T. R. New

1993. International Union for the Conservation of Nature and Natural Resources, Gland, Switzerland. 173 pp., 31 figs., softcover (21.5 x 28.0 cm). ISBN 2-8317-0159-7. Price: £5.95 (order from IUCN Publications Services Unit, 219 Huntingdon Road, Cambridge CB3 0DL, United Kingdom; Check or International Money Order payable to IUCN; add 15% for packing and surface mail costs).

This wonderful volume is the third in a series of books authored or edited by T. R. New on lepidopteran conservation biology (see earlier reviews of "Swallowtail Butterflies: An Action Plan for Their Conservation," in *Tropical Lepidoptera*, 3(1): 50, and "Directory of Lepidoptera Conservation Projects," in *Tropical Lepidoptera*, 2(1): 58). Starting with the beautiful color cover illustrating the Karner Blue, *Lycaeides melissa samuelis*, this 173-page book is packed with information of interest to tropical and temperate lepidopterists alike. Dr. New has drawn on the expertise of 31 contributors from around the world to insure that this volume has excellent coverage of lycaenid butterfly conservation and the large literature on lycaenid biology.

To many readers, it may be surprising to learn how much conservation effort has been directed towards members of this largest family of butterflies, the Lycaenidae—a group which New's volume defines as including the blues, coppers, hairstreaks, metalmarks, and related forms. Comprising up to 40% of all butterfly species, the Lycaenidae are the most diverse family of Papilionoidea (at least, when it is defined as including the metalmarks as a subfamily, Riodininae, and the Styginae, both of which have been given family status by some workers). With as many as 6,900 species, the Lycaenidae are most diverse in the tropics, especially the Neotropics (with approximately 2,300 species). Yet many of the conservation efforts with butterflies to date have been on lycaenid species of the Holarctic, and because of this, many of the case histories discussed in this volume are from the Nearctic and Palearctic. However, substantial parts of this volume include material on neotropical and African as well as some Asian species of Lycaenidae.

The book is organized into three sections. The first section, authored by T. R. New, is an introduction to the biology and conservation of the Lycaenidae. It includes succinct but information-packed sections on their taxonomy, diversity and distribution, life histories and biology, endangering processes, and conservation programs. The life histories and biology section includes excellent summaries of myrmecophily and its effect on evolution in lycaenids, as well as larval feeding on such diverse substrates as flower petals, reproductive parts, Homoptera, and the fleshy internal pulp of succulent leaves. Discussions of adult feeding, adult sexual dimorphism, adult behavior, and defense against predators add additional information. The discussion of endangering processes which may lead to the decline of these butterflies include collecting and trade (examples of this influence pertain mostly to inadvertent damage, and it is noted "that in most cases collecting is probably the subsidiary rather than the prime cause of decline or extinction"). Habitat alteration and destruction is considered the prime threat to all lycaenid species with limited distributions and low vagility. This section also includes tables of all the species protected by legislation in Europe, in India, and in the international IUCN Red List of Threatened Animals. Pollution and exotic introductions are also treated as possible factors influencing the abundance of rare

Lycaenidae. In discussing the conservation of Lycaenidae, New treats public awareness (including putting Lycaenidae on postage stamps, for which a complete world list is given for issues through October 1991), identification of threatened species and critical faunas, management of lycaenid populations, and *ex situ* conservation (controlled captive rearing of lycaenids). An excellent reference section completes this first part.

The second part of the book consists of a series of regional overviews of lycaenids for the parts of the world where interest and knowledge have been sufficient to prepare this kind of an overview. Keith Brown gives an excellent overview of the situation in tropical America, while J. Hall Cushman and Dennis D. Murphy give an overview of the conservation picture for North American lycaenids. Toshiya Hirowatari gives an overview of problems in Japan. Michael J. Samways gives an excellent essay on the threatened Lycaenidae of South Africa, including maps and graphs as well as a complete table of species. T. R. New gives an outstanding overview of the situation regarding Australian Lycaenidae. This part and the preceding introductory part occupy the first 76 pages of the book.

The final nearly 100 pages of the book are accounts of particular taxa or communities of lycaenid butterflies. This series of selected case histories or species accounts range from the well-known to the novel, and include the extinct Xerces Blue, *Glaucopsyche xerces*, which was last seen in California in 1943. Each species account gives the butterfly's status and conservation interest, taxonomy and description, distribution, population size, habitat and ecology, discussion of conservation efforts, and analysis of threats to the species' continuing existence. An excellent bibliography usually accompanies each account.

In summary, this book represents another outstanding contribution by Tim New to butterfly conservation biology and to the international effort to preserve both tropical and temperate Lycaenidae in their habitats. As aptly pointed out in the book, lycaenids are normally rather inconspicuous animals and not ones that the general public would first notice. Yet, they serve as a very sensitive indicator to the health of the habitat, because their continued existence can be affected by relatively minor environmental perturbations. Thus they are of key importance as indicator species, to say nothing of their ecological, biological, and evolutionary interest to lepidopterists, naturalists, and other biologists.

Virtually every lepidopterist with an interest in Lycaenidae in any part of the world will want to have a copy of this inexpensive book in his or her library. It makes available a tremendous amount of information in a compact, highly usable form, and the reader will have many enjoyable hours of reading and making repeated reference to his or her copy of this outstanding work.

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