

Monitoring Butterflies For Ecology And Conservation The British Butterfly Monitoring Scheme 1st Edit

Monitoring Butterflies for Ecology and Conservation The British Butterfly Monitoring Scheme Springer Science & Business Media

Due to the attractiveness of butterflies, and their usefulness as model systems for biological questions, there has been a considerable amount of material written on butterfly biology, largely in Europe. This book synthesizes all relevant and recent knowledge in the field, which is a must for those making use of this taxonomic group as a model system. It is divided into five major parts which deal with habitat use, population ecology and genetics, evolutionary ecology, distribution and phylogeny, and global change and conservation. There are growing numbers of scientific projects and networks in Europe in which the use of butterflies as tools and targets for conservation is central, and application of knowledge is closely related to European cultural landscapes. However, the chapters can also be applied to a wide geographic scope. Written by an international team of experts, this timely book is suitable for students, researchers and enthusiasts.

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Presents twenty-seven studies on the monarch butterfly's life cycle including papers presented at the 2001 Monarch Population Dynamics Conference and data compiled by both Journey North and the Monarch Larva Monitoring Project.

This volume sets out to provide an overview of recent research on all aspects of amphibian ecology and behaviour and to illustrate its application to practical conservation measures for this major group of animals. Its broad scope makes it of relevance to students of general biology, ecology and conservation, but also to professionals in industries and agencies involved with environmental issues and nature conservation.

Monarch butterflies are among the most popular insect species in the world and are an icon for conservation groups and environmental education programs. Monarch caterpillars and adults are easily recognizable as welcome visitors to gardens in North America and beyond, and their spectacular migration in eastern North America (from breeding locations in Canada and the United States to overwintering sites in Mexico) has captured the imagination of the public. Monarch migration, behavior, and chemical ecology have been studied for decades. Yet many aspects of monarch biology have come to light in only the past few years. These aspects include questions regarding large-scale trends in monarch population sizes, monarch interactions with

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pathogens and insect predators, and monarch molecular genetics and large-scale evolution. A growing number of current research findings build on the observations of citizen scientists, who monitor monarch migration, reproduction, survival, and disease. Monarchs face new threats from humans as they navigate a changing landscape marked by deforestation, pesticides, genetically modified crops, and a changing climate, all of which place the future of monarchs and their amazing migration in peril. To meet the demand for a timely synthesis of monarch biology, conservation and outreach, *Monarchs in a Changing World* summarizes recent developments in scientific research, highlights challenges and responses to threats to monarch conservation, and showcases the many ways that monarchs are used in citizen science programs, outreach, and education. It examines issues pertaining to the eastern and western North American migratory populations, as well as to monarchs in South America, the Pacific and Caribbean Islands, and Europe. The target audience includes entomologists, population biologists, conservation policymakers, and K–12 teachers.

Reflecting what a new generation of conservation biologists is doing and thinking, this vital and far ranging second edition explores where conservation biology is heading. It challenges many conventions of conservation biology by exposing certain

weaknesses of widely accepted principles.

Combining contributions from both the school and the new breed of conservation biologists, this insightful text focuses primarily on topics that are integral to the daily activities of conservation biologists. Several chapters address ecosystem restoration and biotic invasions as well as the mechanics of population viability analyses, which are now a routine facet of conservation efforts. A case history approach is implemented throughout the book, with the use of practical real-world examples. Furthermore, an in-depth look at quantitative analyses is presented, allowing for models and mathematical analyses to pinpoint limitations in existing data and guide research toward those aspects of biology that are most likely to be critical to the dynamics of a species or an ecosystem.

In recent years an increasing number of studies have been published reporting observations of adapted behaviour and shifting species ranges of plant and animal species due to recent climate warming. Are these 'fingerprints' of climate change? An international conference was organised to bring together scientists from different continents with different expertise but sharing the same issue of climate change impact studies. Ecologists, zoologists, and botanists exchanged and discussed the findings from their individual field of research. The present book is an international collection of

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biological signs of recent climate warming, neither based only on computer models nor on prediction for the future, but mainly on actually occurring changes in the biosphere such as adapted behaviour or shifts in the ranges of species. 'Fingerprints' of Climate Change presents ecological evidence that organisms are responding to recent global warming. The observed changes may foreshadow the types of impacts likely to become more frequent and widespread with continued warming.

Periodic comprehensive overviews of the status of the diverse organisms that make up wildlife are essential to determining trends, threats and future prospects. Just over 25 years ago, leading authorities on different kinds of wildlife came together to prepare an assessment of their status of a wide range of organisms in Great Britain and Ireland i

Proceedings of the Fourth Symposium on the Environmental Monitoring Assessment Program (EMAP), San Francisco, CA, USA, April 6-8, 1999

Monitoring Plant and Animal Populations offers an overview of population monitoring issues that is accessible to the typical field biologist and land managers with a modest statistical background. The text includes concrete guidelines for ecologists to follow to design a statistically defensible monitoring program. User-friendly, practical guide, written in a highly readable format. The authors provide an interdisciplinary scope to address the current, widespread interest in monitoring in many environmental fields, including pure and applied ecology,

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conservation biology, and wildlife management.

Emphasizes the role of monitoring in adaptive management. Defines important terminology and contrasts monitoring with other data-collection activities. Covers the applicable principles of sampling and shows how to design a monitoring project. Provides a step-by-step overview of the monitoring process, illustrated by flow charts and references. The authors also offer guidelines for analyzing and interpreting monitoring data. Illustrates the foundation of management objectives and describes their components, types, and development. Describes common field techniques for measuring important attributes of animal and plant populations. Reviews different methods for recording monitoring data in the field, managing the data, and communicating data to policymakers.

A survey of the development and practice of butterfly conservation in south east Australia, tracing evolution of the science through a series of cases from focus on single subspecies through increasing levels of ecological complexity to critical biotopes and communities. The book summarises much previously scattered information, and provides access to much regional information of considerable interest to practitioners elsewhere.

In *Butterflies: Ecology and Evolution Taking Flight*, the world's leading experts synthesize current knowledge of butterflies to show how the study of these fascinating creatures as model systems can lead to deeper understanding of ecological and evolutionary patterns and processes in general. The twenty-six chapters are organized into broad functional areas, covering the uses

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of butterflies in the study of behavior, ecology, genetics and evolution, systematics, and conservation biology. Especially in the context of the current biodiversity crisis, this book shows how results found with butterflies can help us understand large, rapid changes in the world we share with them—for example, geographic distributions of some butterflies have begun to shift in response to global warming, giving early evidence of climate change that scientists, politicians, and citizens alike should heed. The first international synthesis of butterfly biology in two decades, *Butterflies: Ecology and Evolution Taking Flight* offers students, scientists, and amateur naturalists a concise overview of the latest developments in the field. Furthermore, it articulates an exciting new perspective of the whole group of approximately 15,000 species of butterflies as a comprehensive model system for all the sciences concerned with biodiversity and its preservation. Contributors: Carol L. Boggs, Paul M. Brakefield, Adriana D. Briscoe, Dana L. Campbell, Elizabeth E. Crone, Mark Deering, Henri Descimon, Erika I. Deinert, Paul R. Ehrlich, John P. Fay, Richard French-Constant, Sherri Fownes, Lawrence E. Gilbert, André Gilles, Ilkka Hanski, Jane K. Hill, Brian Huntley, Niklas Janz, Greg Kareofelas, Nusha Keyghobadi, P. Bernhard Koch, Claire Kremen, David C. Lees, Jean-François Martin, Antónia Monteiro, Paulo César Motta, Camille Parmesan, William D. Patterson, Naomi E. Pierce, Robert A. Raguso, Charles Lee Remington, Jens Roland, Ronald L. Rutowski, Cheryl B. Schultz, J. Mark Scriber, Arthur M. Shapiro, Michael C. Singer, Felix Sperling, Curtis Strobeck, Aram Stump, Chris D.

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Thomas, Richard VanBuskirk, Hans Van Dyck, Richard I. Vane-Wright, Ward B. Watt, Christer Wiklund, and Mark A. Willis

The effects of isolation, area size, and habitat quality on the survival of animal and plant populations in the cultural landscape are central aspects of a research project started in Germany in 1993

(,Forschungsverbund, Isolation, FHichengroBe und BiotopqualiHit', abbreviated to 'FIFB'). After a long period of preparation, scientists from seven univer sities and one research institution started to work within the frame of this project. Fund ing for four years was provided by the former German Federal Ministry of Research and Technology (BMFT), now the Ministry of Education and Research (BMBF). A strong focus of the project has been the improvement of the methodology for environmental impact assessments and the implementation of results into environmental planning. As there is a certain risk that national projects develop some kind of 'mental in breeding', it was decided to discuss concepts, methods, and first results with scientists of international reputation at a rather early stage of the project. For this purpose, an inter national workshop was held in the small village of Lubast, north of Leipzig (state of Saxony) in March 1995. 130 scientists from 10 nations met to discuss and debate issues surrounding habitat fragmentation for three days. Papers presented there formed the basis for this book. As discussions included general reviews as well as particular case studies, we decided to structure this book in a similar way. Consequently, a combination of broad

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and more general, review-like papers as well as original papers are presented.

Citizen science, the active participation of the public in scientific research projects, is a rapidly expanding field in open science and open innovation. It provides an integrated model of public knowledge production and engagement with science. As a growing worldwide phenomenon, it is invigorated by evolving new technologies that connect people easily and effectively with the scientific community. Catalysed by citizens' wishes to be actively involved in scientific processes, as a result of recent societal trends, it also offers contributions to the rise in tertiary education. In addition, citizen science provides a valuable tool for citizens to play a more active role in sustainable development. This book identifies and explains the role of citizen science within innovation in science and society, and as a vibrant and productive science-policy interface. The scope of this volume is global, geared towards identifying solutions and lessons to be applied across science, practice and policy. The chapters consider the role of citizen science in the context of the wider agenda of open science and open innovation, and discuss progress towards responsible research and innovation, two of the most critical aspects of science today.

Butterfly watching has begun to gain the popularity that bird watching has enjoyed for half a century. Much as birds served as a flagship of the conservation movement in this country, butterflies are coming to be seen as the rallying point for the protection of invertebrate species--now regarded as increasingly important for the

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well-being of all members of the ecosystem. Butterflies of New Jersey discusses the behavior, status, distribution, taxonomy, ecology, and conservation of butterflies in New Jersey. It is an innovative companion and complement to any butterfly identification guide of the Northeast. It pays particular attention to the place of butterflies in the ecosystem of New Jersey and neighboring regions and their relationships to other butterflies around the world. Its detailed species accounts of 140-plus kinds of butterflies found in the state and neighboring regions (out of 700 North American species) alert butterfly watchers to changes in populations over time. Where other butterfly guides typically include a section on collecting butterflies, this one includes a detailed chapter on protecting them by creating butterfly gardens and preventing habitat destruction. Butterflies of New Jersey is indispensable for everyone interested in the butterflies and natural history of the Garden State and its neighbor.

The third in a trilogy of global overviews of conservation of diverse and ecologically important insect groups. The first two were Beetles in Conservation (2010) and Hymenoptera and Conservation (2012). Each has different priorities and emphases that collectively summarise much of the progress and purpose of invertebrate conservation. Much of the foundation of insect conservation has been built on concerns for Lepidoptera, particularly butterflies as the most popular and best studied of all insect groups. The long-accepted worth of butterflies for conservation has led to elucidation of much of the current rationale of insect

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species conservation, and to definition and management of their critical resources, with attention to the intensively documented British fauna 'leading the world' in this endeavour. In Lepidoptera and Conservation, various themes are treated through relevant examples and case histories, and sufficient background given to enable non-specialist access. Intended for not only entomologists but conservation managers and naturalists due to its readable approach to the subject.

Contributed to by leading experts, this book looks at the history of coppice woodlands, their physical environment, the different management techniques used and their effects on the flora and fauna. The implications of this for conservation is controversial and this is debated in a lively way in many of the chapters.

Previously published in hardback and now made available in paperback, this ground-breaking book is a must for all interested in butterflies, whether as conservation biologist, amateur or professional entomologist or as a student studying the phenomenon of butterfly populations as part of a number of biology, ecology or conservation courses. Recently, many British butterflies have suffered severe declines while others have flourished and expanded in range. This is the first book to describe the results from a British scheme to monitor butterflies during this period of change. The Monitoring Scheme, initiated in 1976 by the senior author is based on frequent counts at some 90 sites throughout Britain. The combined efforts of both amateurs and professionals have thus produced a dataset with no equivalent elsewhere in the world. The book therefore

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provides a unique perspective on trends in numbers, extinction and foundation of populations; flight periods, local distributions, migration and other aspects of population ecology. Practical problems encountered during the conservation of butterflies of individual sites are outlined. The relevance of this monitoring for an understanding of the effects of the weather - climatic warming - is described.

This book was conceived to mark the Silver Jubilee of the British Butterfly Conservation Society. Interest in the conservation of butterflies has increased so rapidly that it is difficult to relate to the situation 25 years ago.

Butterflies were on the decline in Britain, Europe and elsewhere but we lacked data on the extent of the decline and the underlying reasons, leaving us unable to implement effective conservation measures. An early recognition of the plight of British butterflies and moths led to the foundation of the society by a small group of conservationists in 1968. Today the society has over 10000 members, owns a number of reserves and sponsors research, conservation and monitoring activities at the local and national level. As part of the Silver Jubilee celebrations an international symposium was held at Keele University in September 1993 entitled 'Ecology and Conservation of Butterflies'. This symposium clearly showed how much important work has been done in recent years and also gave me the impression that the subject had reached a watershed. This was not because the decline of butterflies has stopped or even slowed down, far from it, the threat to our butterflies continues to increase from habitat

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destruction and intensification of land use. The watershed is in our understanding of the relationship between butterflies and their habitat.

This is an updated version of the best selling first edition, *Ecological Census Techniques*, with updating, some new chapters and authors. Almost all ecological and conservation work involves carrying out a census or survey. This practically focussed book describes how to plan a census, the practical details and shows with worked examples how to analyse the results. The first three chapters describe planning, sampling and the basic theory necessary for carrying out a census. In the subsequent chapters international experts describe the appropriate methods for counting plants, insects, fish, amphibians, reptiles, mammals and birds. As many censuses also relate the results to environmental variability, there is a chapter explaining the main methods. Finally, there is a list of the most common mistakes encountered when carrying out a census.

" ... A compilation of 122 taxa of butterflies and moths that are of special interest in the Pacific Northwest, regarding forest service management and conservation.

... The list of butterflies and moths is dominated by species and subspecies that are uncommon or rare, but we have included species that are widely distributed and associated with particular plant communities of special interest in the Pacific Northwest ..."--Taken from p. ii,

About This Book.

Islands are special places; they can be havens for unique plants and animals and refuges for wildlife.

This book investigates the biogeography of butterfly

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species over the British islands, particularly the factors that influence their presence on the islands and that have made each island's butterfly fauna distinctive. The book contains a full log of records of species on the islands and much supporting information. The first three chapters set the scene, illustrating the basics of island biogeography theory, their changing circumstances during the current Holocene interglacial, and studies of natural history of British butterflies that mark the islands as the most intensively studied region for wildlife in the world. The book advances by increasing resolution downscale from a European continental perspective, through patterns and changes on the British mainland, a comparison of the two dominant islands of Britain and Ireland, to a close inspection of the dynamics of species on the multitude of offshore islands. Detailed investigations include contrasts in species' richness on the islands and then of the incidences of each species. Case studies highlight the continual turnover of species on islands. Attention is then given to evolutionary changes since the time that glaciers enveloped Europe. A powerful message is conveyed for the maintenance of butterfly species on the smaller British islands now experiencing population losses at a rate unprecedented since the spread of the last ice sheets: the incontrovertible importance of maintaining populations of species on nearby

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mainland sources for islands as pools for future migrants.

Wildlife Responses to Climate Change is the culmination of a three-year project to research and study the impacts of global climate change on ecosystems and individual wildlife species in North America. In 1997, the National Wildlife Federation provided fellowships to eight outstanding graduate students to conduct research on global climate change, and engaged leading climate change experts Stephen H. Schneider and Terry L. Root to advise and guide the project. This book presents the results, with chapters describing groundbreaking original research by some of the brightest young scientists in America. The book presents case studies that examine: ways in which local and regional climate variables affect butterfly populations and habitat ranges how variations in ocean temperatures have affected intertidal marine species the potential effect of reduced snow cover on plants in the Rocky Mountains the potential effects of climate change on the distribution of vegetation in the United States how climate change may increase the susceptibility of ecosystems to invasions of non-native species the potential for environmental change to alter interactions between a variety of organisms in whitebark pine communities of the Greater Yellowstone Ecosystem Also included are two introductory chapters by Schneider and Root

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that discuss the rationale behind the project and offer an overview of climate change and its implications for wildlife. Each of the eight case studies provides important information about how biotic systems respond to climatic variables, and how a changing climate may affect biotic systems in the future. They also acknowledge the inherent complexities of problems likely to arise from changes in climate, and demonstrate the types of scientific questions that need to be explored in order to improve our understanding of how climate change and other human disturbances affect wildlife and ecosystems. *Wildlife Responses to Climate Change* is an important addition to the body of knowledge critical to scientists, resource managers, and policymakers in understanding and shaping solutions to problems caused by climate change. It provides a useful resource for students and scientists studying the effects of climate change on wildlife and will assist resource managers and other wildlife professionals to better understand factors affecting the species they are striving to conserve.

The state of ecosystems, biological communities and species are continuously changing as a result of both natural processes and the activities of humans. In order to detect and understand these changes, effective ecological monitoring programmes are required. This book offers an introduction to the topic and provides both a rationale for monitoring and a

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practical guide to the techniques available. Written in a nontechnical style, the book covers the relevance and growth of ecological monitoring, the organizations and programmes involved, the science of ecological monitoring and an assessment of methods in practice, including many examples from monitoring programmes around the world. Building on the success of the first edition, this edition has been fully revised and updated with two additional chapters covering the relevance of monitoring to the reporting of the state of the environment, and the growth of community based ecological monitoring. The book addresses this critical need by providing a straightforward and easy to read primer to key elements of at-risk butterfly conservation programs including captive husbandry, organism reintroduction, habitat restoration, population monitoring, recovery planning and cooperative programs. Impacts from habitat loss and fragmentation, invasive species, and climate change continue to accelerate the rate of imperilment and necessitate increased conservation action. Zoos, natural history museums, botanical gardens and wildlife agencies are progressively focusing on insects, particularly charismatic groups such as butterflies and native pollinators, to help advance local conservation efforts and foster increased community interest and engagement. Today, many institutions and their partners have successfully

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initiated at-risk butterfly conservation programs, and numerous others are exploring ways to become involved. However, insufficient experience and familiarity with insects is a critical constraint preventing staff and institutions from adequately planning, implementing and evaluating organism-targeted activities. The information provided is intended to improve staff practices, learn from existing programs, promote broader information exchange, and strengthen institutional ability to develop new or improve existing butterfly conservation initiatives. The information provided is intended to improve staff practices, learn from existing programs, promote broader information exchange, and strengthen institutional ability to develop new or improve existing butterfly conservation initiatives. This book will be useful to professionals from zoos, natural history museums, botanical gardens, wildlife agencies, conservation organizations, land managers, students, and scientist in conservation biology, ecology, entomology, biology, and zoology.

This field guide to Indiana's rich butterfly fauna covers all 149 species of butterflies and their close relatives, the skippers. Over 500 color photographs illustrate the undersides and uppersides of most species and highlight the variations found among them, both seasonally and between males and females. For beginners and experts, Butterflies of

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Indiana also offers an introduction to the natural history of butterflies. The simple and intuitive design of this guide and its wealth of features make it a faithful companion for butterfly watchers, collectors, gardeners, birders, and naturalists.

Biodiversity is recognised to be of global importance, yet species and habitats continue to be under increasing pressure from human-induced influences. Environmental concerns are high on the political agenda, driving increased legislation to protect the natural environment. The starting point for much of this legislation is the requirement for a comprehensive biodiversity audit. For those needing to undertake such audits, this Handbook, first published in 2005, provides standard procedures which will enable practitioners to better monitor the condition of the biodiversity resource, resulting in improved data upon which to base future policy decisions and actions. Organised in three parts, the Handbook first addresses planning, covering method selection, experimental design, sampling strategy, and data analysis and evaluation. The second part describes survey, evaluation and monitoring methods for a broad range of habitats. Part three considers species and provides information on general methods before addressing specific methods of survey and monitoring for the major taxonomic groups.

This book is a printed edition of the Special Issue

"Urban and Periurban Forest Diversity and Ecosystem Services"

Arthropods are invertebrates that constitute over 90% of the animal kingdom, and their bio-ecology is closely linked with global functioning and survival. Arthropods play an important role in maintaining the health of ecosystems, provide livelihoods and nutrition to human communities, and are important indicators of environmental change. Yet the population trends of several arthropods species show them to be in decline. Arthropods constitute a dominant group with 1.2 million species influencing earth's biodiversity. Among arthropods, insects are predominant, with ca. 1 million species and having evolved some 350 million years ago. Arthropods are closely associated with living and non-living entities alike, making the ecosystem services they provide crucially important. In order to be effective, plans for the conservation of arthropods and ecosystems should include a mixture of strategies like protecting key habitats and genomic studies to formulate relevant policies for in situ and ex situ conservation. This two-volume book focuses on capturing the essentials of arthropod inventories, biology, and conservation. Further, it seeks to identify the mechanisms by which arthropod populations can be sustained in terrestrial and aquatic ecosystems, and by means of which certain problematic species be managed without producing harmful environmental side-effects. This edited compilation includes chapters contributed by over 80 biologists on a wide range of topics embracing the diversity, distribution, utility and conservation of arthropods and select groups of insect taxa. More importantly, it describes in detail the mechanisms of sustaining arthropod ecosystems, services and populations. It addresses the contribution of modern biological tools such as molecular and genetic techniques regulating gene

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expression, as well as conventional, indigenous practices in arthropod conservation. The contributors reiterate the importance of documenting and understanding the biology of arthropods from a holistic perspective before addressing conservation issues at large. This book offers a valuable resource for all zoologists, entomologists, ecologists, conservation biologists, policy makers, teachers and students interested in the conservation of biological resources. Monitoring has become fashionable. Business now talks about monitoring its activities, efficiency, costs and profits. The National Health Service is monitoring general practices and hospitals; it is keen to have more information about efficiency and the duration of stay of patients in different hospitals undergoing different types of treatment. These activities are usually carried out in relation to specific objectives with the aim of making activities more cost effective and competitive. Does the same apply in biology, ecology and nature conservation? Or, are we still enjoying conducting field surveys for the fun of it, at best with rather vague objectives and saying to our colleagues that we do our work because we need to know what is there? This book is an opportunity to consider some of the reasons why monitoring is important, how it differs from survey, how it may be able to answer specific questions and help with site management or problem solving. It will explore some of the taxa that are suitable for recording and how you may actually set about doing it. It is not intended as a catalogue of techniques but we will in each chapter give you sources of material so that with the minimum of effort you will be able to proceed with an efficient, relevant and not too time consuming monitoring programme. Some of the points that you need to consider before starting are also set down in the synthesis at the end of the book.

A remarkable look at the rarest butterflies, how global

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changes threaten their existence, and how we can bring them back from near-extinction Most of us have heard of such popular butterflies as the Monarch or Painted Lady. But what about the Fender's Blue? Or the St. Francis' Satyr? Because of their extreme rarity, these butterflies are not well-known, yet they are remarkable species with important lessons to teach us. The Last Butterflies spotlights the rarest of these creatures—some numbering no more than what can be held in one hand. Drawing from his own first-hand experiences, Nick Haddad explores the challenges of tracking these vanishing butterflies, why they are disappearing, and why they are worth saving. Haddad illustrates the race against time to reverse the decline of butterfly species, and he provides startling insights into the effects of human activity and environmental change on the planet's biodiversity. A moving account of extinction, recovery, and hope, The Last Butterflies demonstrates the great value of these beautiful insects to science, conservation, and people.

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