



ECOSYSTEMS AND HUMAN WELL-BEING

Biodiversity Synthesis



MILLENNIUM ECOSYSTEM ASSESSMENT



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ECOSYSTEMS AND HUMAN WELL-BEING

Biodiversity Synthesis

A Report of the Millennium Ecosystem Assessment

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Suggested citation:

Millennium Ecosystem Assessment, 2005. *Ecosystems and Human Well-being: Biodiversity Synthesis*.
World Resources Institute, Washington, DC.

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may be reproduced in any form or by any means without permission in writing from the publisher: World
Resources Institute, 10 G Street NE, Suite 800, Washington DC, 20002, USA.

Library of Congress Cataloging-in-Publication data.

British Cataloguing-in-Publication data available.

Printed on recycled, acid-free paper 

Book design by Dever Designs

Manufactured in the United States of America

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FOREWORD

The Millennium Ecosystem Assessment set out to assess the consequences of ecosystem change for human well-being and to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to human well-being. Biological diversity plays a critical role in underpinning ecosystem services. Governments supported the establishment of the MA through decisions taken by the Convention on Biological Diversity and other international conventions. The MA was initiated in 2001 under the auspices of the United Nations and governed by a multistakeholder board that included representatives of international institutions, governments, indigenous peoples, NGOs, and business. The secretariat was coordinated by the United Nations Environment Programme. More than 1,360 scientists from 95 countries contributed to the assessment.

This report presents a synthesis and integration of the findings concerning biodiversity contained in the reports of the four MA Working Groups (Condition and Trends, Scenarios, Responses, and Sub-global Assessments). From the outset, the MA was designed to meet the needs of the Convention on Biological Diversity, among other users. The Conference of the Parties welcomed the contribution of the MA to the assessment work of the Convention. It encouraged Parties to participate in the MA and nominated the Chair of the Subsidiary Body on Scientific, Technical, and Technological Advice and the Executive Secretary to be represented on the MA Board. Parties to the CBD have provided review comments on underlying chapters of the assessment as well as this synthesis report. In addition, the penultimate draft of the synthesis report was presented to the tenth meeting of SBSTTA in February 2005, and the comments made there were taken into account in its finalization. As requested by the Conference of the Parties, SBSTTA will consider the final products of the Millennium Ecosystem Assessment at its eleventh meeting—including this synthesis report on biodiversity—in order to prepare recommendations to the Conference of the Parties concerning the implications of the findings for the future work of the Convention.

This report would not have been possible without the extraordinary commitment of the more than 2,000 authors and reviewers worldwide who contributed their knowledge, creativity, time, and enthusiasm to the development of the assessment. We would like to express our gratitude to the Synthesis Team that prepared this report and to the MA Assessment Panel, Coordinating Lead Authors, Lead Authors, Contributing Authors, Board of Review Editors, and Expert Reviewers who contributed to this process, and we wish to acknowledge the in-kind support of their institutions, which enabled their participation. We would also like to thank the current and past members of the MA Board (and their alternates), the members of the MA Exploratory Steering Committee, the Convention on Biological Diversity secretariat staff, and the MA secretariat staff, interns, and volunteers for their contributions to this process.

We are extremely grateful to the donors that provided major financial support for the MA: Global Environment Facility; United Nations Foundation; The David and Lucile Packard Foundation; The World Bank; Consultative Group on International Agricultural Research; United Nations Environment Programme; Government of China; Ministry of Foreign Affairs of the Government of Norway; Kingdom of Saudi Arabia; and the Swedish International Biodiversity Programme. The full list of organizations that provided financial support to the MA is available at www.MAweb.org.

We hope that this report will prove useful to all those concerned with the Convention on Biological Diversity and with its objectives—the conservation and sustainable use of biological diversity and the fair and equitable sharing of benefits arising from the use of genetic resources.



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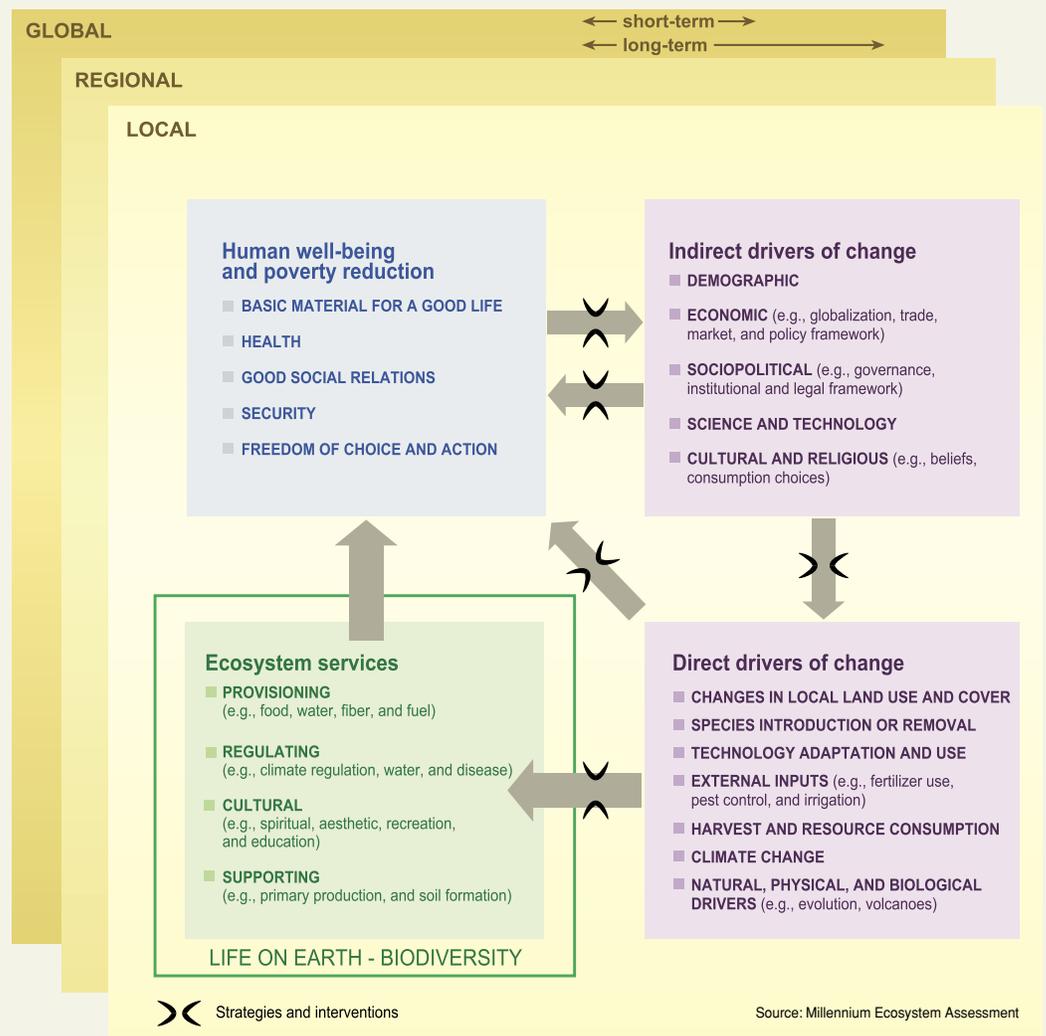
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PREFACE

The goal of the Millennium Ecosystem Assessment is to establish the scientific basis for actions needed to enhance the conservation and sustainable use of ecosystems and their contributions to meeting human needs. Because the basis of all ecosystems is a dynamic complex of plants, animals, and microorganisms, biological diversity (or biodiversity, for short) has been a key component of the MA. The MA recognizes that interactions exist between people, biodiversity, and ecosystems. That is, changing human conditions drive, both directly and indirectly, changes in biodiversity, changes in ecosystems, and ultimately changes in the services ecosystems provide. Thus biodiversity and human well-being are inextricably linked. (See Figure A.) The MA also recognizes that many other factors independent of changes in biodiversity affect the human condition and that biodiversity is influenced by many natural forces that are not associated with humans.

Figure A. MILLENNIUM ECOSYSTEM ASSESSMENT CONCEPTUAL FRAMEWORK OF INTERACTIONS BETWEEN BIODIVERSITY, ECOSYSTEM SERVICES, HUMAN WELL-BEING, AND DRIVERS OF CHANGE

Changes in drivers that indirectly affect biodiversity, such as population, technology, and lifestyle (upper right corner), can lead to changes in drivers directly affecting biodiversity, such as the catch of fish or the application of fertilizers to increase food production (lower right corner). These result in changes to biodiversity and to ecosystem services (lower left corner), thereby affecting human well-being. These interactions can take place at more than one scale and can cross scales. For example, international demand for timber may lead to a regional loss of forest cover, which increases flood magnitude along a local stretch of a river. Similarly, the interactions can take place across different time scales. Actions can be taken either to respond to negative changes or to enhance positive changes at almost all points in this framework. Local scales refer to communities or ecosystems and regional scales refer to nations or biomes, all of which are nested within global scale processes.



Human well-being is the central focus for the MA, but biodiversity and ecosystems also have intrinsic value. People make decisions concerning ecosystems based on considerations of well-being as well as intrinsic value.

A full assessment of the interactions between people and biodiversity requires a multiscale approach, as this better reflects the multiscale nature of decision-making, allows the examination of driving forces from outside particular regions, and provides a means of examining the differential impact of changes in biodiversity, ecosystem services, and policy responses on different regions and groups within regions. The MA thus consists of a global assessment and 33 sub-global assessments. (See Figure B.)

Figure B. MA SUB-GLOBAL ASSESSMENTS

Eighteen sub-global assessments were approved as components of the MA. These were not designed to provide a scientific sample of any feature of ecosystems or human well-being. Instead, the choice of assessment locations was determined by a combination of interest in undertaking the assessment, interest in using the findings, and availability of resources to undertake the assessment. These assessments thus were primarily designed to meet needs of decision-makers in the locations where they were made, but they also informed the global MA findings with information and perspectives from the sub-global scale and vice versa. The MA also drew on information from 15 other sub-global assessments affiliated with the MA that met a subset of these criteria or were at earlier stages in development.



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