

**Biodiversity Indicators for
Integrated Environmental Assessments
at the Regional and Global Level:**

**Feasibility study on data availability
of six biodiversity indicators**

Final Report



**WORLD CONSERVATION
MONITORING CENTRE**



The World Conservation Monitoring Centre,
provides information services on the conservation and
sustainable use of species and ecosystems and supports
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Prepared by

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April 1996

The **World Conservation Monitoring Centre**, based in Cambridge, UK. is a joint-venture between the three partners in the *World Conservation Strategy* and its successor *Caring For The Earth*: IUCN - The World Conservation Union, UNEP - United Nations Environment Programme, and WWF - World Wide Fund for Nature. The Centre provides information services on the conservation and sustainable use of species and ecosystems and supports others in the development of their own information systems.

Prepared for: National Institute of Public Health and Environmental Protection (RIVM)

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- Annex A.** Terms of reference for feasibility study
- Annex B.** Criteria and indicators for the conservation and sustainable management of temperate and boreal forests
- Annex C.** Examples of species and ecosystem indicators of ecosystem area and quality
- Annex D.** List of countries and the proportion of Udvardy's biogeographical provinces they contain
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- Annex F.** Examples of potential co-ordinating institutes for biodiversity indicators
- Annex G.** Examples of potential national institutes for indicator selection and development

INTRODUCTION

This document has been produced by the World Conservation Monitoring Centre (WCMC) in response to the terms of reference of an agreement with the National Institute of Public Health and Environmental Protection (RIVM), Bilthoven, The Netherlands. The original terms of reference and subsequent amendment are appended as Annex A.

Under a programme called the Global Environmental Outlook (GEO), The United Nations Environment Programme (UNEP) is developing integrated environmental assessments. It proposes to do this through:

- identifying interlinkages between socio-economic and environmental issues;
- identifying major social and economic driving forces;
- supporting the international policy process to come to action on driving forces.

As a "Collaborating Centre for Integrated Environmental Reporting, Assessments and Forecasting" of UNEP, RIVM is developing methodologies for integrated environmental assessments at the regional and global level. To describe and assess the impacts on biodiversity and the use of biological resources, RIVM has identified a preliminary core set of six biodiversity and use indicators. WCMC has been asked to assess the availability of data that might support these indicators. Interim results of this feasibility study were adapted and elaborated upon in a discussion paper "Biodiversity indicators for integrated environmental assessments at the regional and global level" of July 1995. The comments of several experts in various parts of the world will be used to further improve the core set of indicators. The intention is to publish the discussion paper in a technical report series of UNEP and to test and improve the indicators by means of pilot studies to take place in 1996 and 1997.

ASSESSMENT OF PROPOSED BIODIVERSITY INDICATORS

INDICATOR 1. ECOSYSTEM AREA

The proposal

As a measure of ecosystem area it has been proposed to use the 'habitat index' (Hannah *et al.* 1993, 1994). This system uses Udvardy (1975) to divide the world into 193 biogeographical provinces. Each province is assumed to have originally comprised one major ecosystem type (eg. East Malagasy rainforest). Hannah used the best available data sets from such sources as agricultural atlases, remote sensing analyses, world environmental maps, IUCN tropical forest maps, population sheets from world atlases, miscellaneous journal articles in addition to detailed local and regional maps. The area of undisturbed natural ecosystem in each province has been measured, as has the area of partially disturbed ecosystem.

An index is derived from these figures to give a measure of how much original ecosystem remains (current extent + 0.25 disturbed extent/original extent). According to RIVM this index appears to meet the 10 criteria for selecting indicators (see Annex A). Given the base assumption that habitat conversion is the greatest single cause of biodiversity loss, RIVM propose that this index can be used to provide an indication of biodiversity loss at the ecosystem level.

Assumptions and problems

1. The Udvardy classification system as a means of dividing terrestrial parts of the world into units.

This has been the subject of some criticism. Udvardy himself never intended it to be definitive, but thought of it merely as a work in progress. This is not necessarily a fundamental problem: any global classification system will be to some extent arbitrary but this need not matter if the intention is to track changes over time (ie. as long as the boundaries between units are kept consistent it is not too important exactly where they are placed).

2. The assumption that each province essentially consists of one ecosystem (ie., has one

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