Threatened ecosystems of PLACEHOLDER_COUNTRY_NAME

An IUCN Red List of Ecosystems Assessment

Jane Smith José García Wei Wang

2000-01-01

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Jane Smith
José García
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  - Update the `version` value
  - Update the `book.title` value
- Edit the `index.qmd` file:
  - Update the `subtitle` value
  - Update the `authors` list

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Foreword

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```yaml
authors:
    - name: Ima Author
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Preface

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Acknowledgments

We gratefully acknowledge the efforts of hundreds of scientists and practitioners who have contributed to the understanding of PLACEHOLDER_COUNTRY_NAME's terrestrial ecosystems. Our work is largely a synthesis exercise that would not have been possible without the dedication and contributions of those before us.

We also acknowledge all contributors to this project, particularly those who attended workshops in PLACEHOLDER_COUNTRY_NAME. Without input from a large and diverse expert group, the development of the PLACEHOLDER_COUNTRY_NAME Ecosystem Typology, the ecosystem descriptions and the application of the criteria would not have been possible. We also acknowledge the crucial support of … Contributors to this assessment are listed within each ecosystem assessment and in Appendix 1.

The work to develop an IUCN Red List of Ecosystems of PLACEHOLDER_COUNTRY_NAME was made possible through the funding and support of …

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Coordinating Organizations

Organization #1

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Organization #2

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Summary

We gratefully acknowledge the efforts of hundreds of scientists and practitioners who have contributed to the understanding of PLACEHOLDER_COUNTRY_NAME's terrestrial ecosystems over the past two centuries. Our work is largely a synthesis exercise that would not have been possible without the dedication and contributions of those before us.

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Introduction

Background

To support the PLACEHOLDER_COUNTRY_NAME National Ecosystem Assessment, PLACEHOLDER_COUNTRY_NAME's terrestrial ecosystems were assessed under the International Union for the Conservation of Nature (IUCN) Red List of Ecosystems Categories and Criteria.

This report describes the development of the IUCN Red List of Ecosystems for PLACEHOLDER_COUNTRY_NAME, which included:

- A detailed literature review of all published and unpublished material relevant to the status of ecosystems in PLACEHOLDER_COUNTRY_NAME;
- The development of an ecosystem typology for PLACEHOLDER_COUNTRY_NAME suitable for conducting a national scale IUCN Red List of Ecosystems assessment;
- ...
- An expert review process for the ecosystem typology, descriptions and assessments.

! How to customize the Background section of the Introduction

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The ecosystems of PLACEHOLDER_COUNTRY_NAME: an overview

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Figure 1: A map of PLACEHOLDER_COUNTRY_NAME showing the area of assessment in grey

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Introduction to the IUCN Red List of Ecosystems

The IUCN Red List of Ecosystems (RLE) aims to support conservation in resource use and management decisions by identifying ecosystems most at risk of loss or collapse (D. A. Keith et al. 2013, 2015). Similar to the IUCN Red List of Threatened Species, the outcome of an RLE assessment is a list of ecosystems and their status for a region (Figure 1.4; (Rodríguez et al. 2011)). Because the RLE was developed to promote a consistent framework suitable for assessing and monitoring the status of ecosystems, it enables comparisons of collapse risk between countries, locations and ecosystem types (D. A. Keith et al. 2013).

For further information on the development of the RLE protocol, the theory and scientific foundations upon which they were developed, and detailed information on the purpose of each of the five criteria refer to the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (L. Bland et al. 2017). More information on the IUCN Red List of Ecosystems, is available in multiple languages on the IUCN Red List of Ecosystems website (www.iucnrle.org).

Assessments of ecosystem types (commonly termed 'assessment units' within Red List of Ecosystems assessments) are conducted by applying five criteria and their associated thresholds, enabling each ecosystem type to be classified according to their risk of collapse (termed

'status'). To ensure the assessment process is transparent and repeatable, each ecosystem type is clearly described according to the IUCN Red List of Ecosystems guidelines (L. Bland et al. 2017). This standard approach of applying the IUCN Red List of Ecosystems Categories and Criteria to clearly described ecosystems is critical to allow for accurate, comparable and repeatable assessments of ecosystems status and to contribute to the global IUCN Red List of Ecosystems programme.

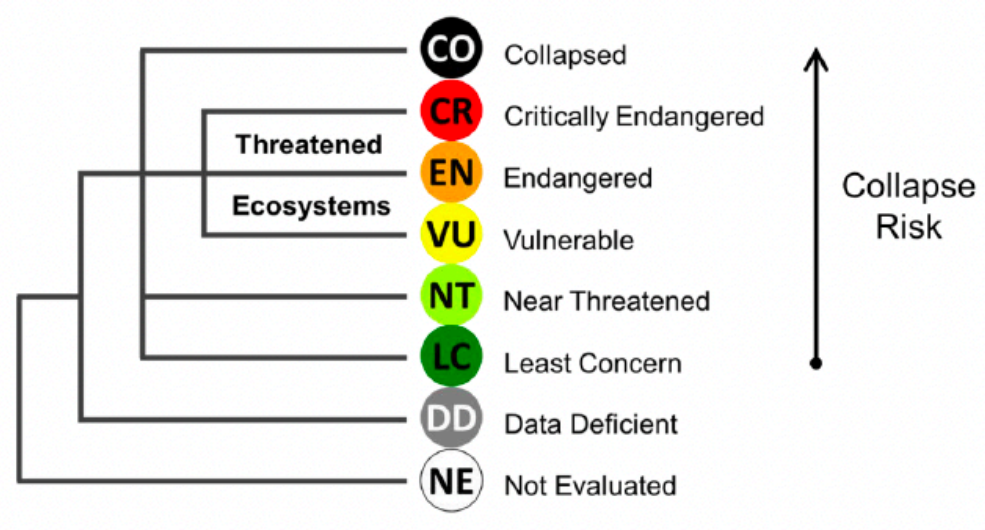

Figure 2: The IUCN Red List of Ecosystems categories, indicating the status of ecosystems. Threatened ecosystems are those assessed as Vulnerable, Endangered, or Critically Endangered. Source: (L. Bland et al. 2017)

Definitions

There are several key concepts that must be clearly defined to allow for repeatable ecosystem risk assessments:

Risk

Risk is defined as the probability of an adverse outcome over a specified time-frame. Here, the adverse outcome is the endpoint of ecosystem decline, which the RLE terms ecosystem collapse.

Ecosystem collapse

Understanding the concept of ecosystem collapse is critical for interpreting IUCN RLE assessments. For the purposes of the RLE, "an ecosystem is Collapsed when it is virtually certain that its defining biotic or abiotic features are lost from all occurrences, and the characteristic native biota are no longer sustained. Collapse may occur when most of the diagnostic components of the characteristic native biota are lost from the system, or when functional components (biota that perform key roles in ecosystem organisation) are greatly reduced in abundance and lose the ability to recruit." According to the IUCN guidelines (L. Bland et al. 2017), risks to ecosystems can be caused by a variety of threatening processes that are expressed through different symptoms of ecosystem collapse. The RLE risk model groups these symptoms into four major types, which ultimately form the RLE criteria (Figure 3).

For more information on the concept of collapse and how to identify when an ecosystem is collapsed, we recommend referring to the IUCN Red List of Ecosystems guidelines, which describes this in detail (Bland et al., 2017a; Bland et al., 2018). In this report and as recommended by the guidelines, we explicitly define collapse for each ecosystem type in Myanmar in their ecosystem descriptions (See section 3).

Time frames

Because risks must be assessed over specified time frames, a standard set of time frames are carefully defined in the IUCN Red List of Ecosystems Categories and Criteria. There are four specified time frames used in the RLE:

- The historical past. We notionally use the year 1750, which marks the onset of industrial-scale exploitation of ecosystems in South-East Asia;
- The recent past. This is the past 50 years (1969-2019), which is considered long enough to distinguish directional change from natural variability;
- Any 50-year period including the recent past, present and future. Predictions and inferences based on past declines, simulation models and any other model considered suitable for assessing risks into the future may be used.
- The future. Again, predictions are required to assess risks over this time frame and are usually based on models that use information about the response of ecosystems to threatening processes.

IUCN Red List of Ecosystems Categories and Criteria

IUCN Red List of Ecosystems Criteria

To assess the risk of ecosystem collapse, each ecosystem is assessed under five rule-based criteria that form the IUCN Red List of Ecosystems Criteria. These criteria were developed following

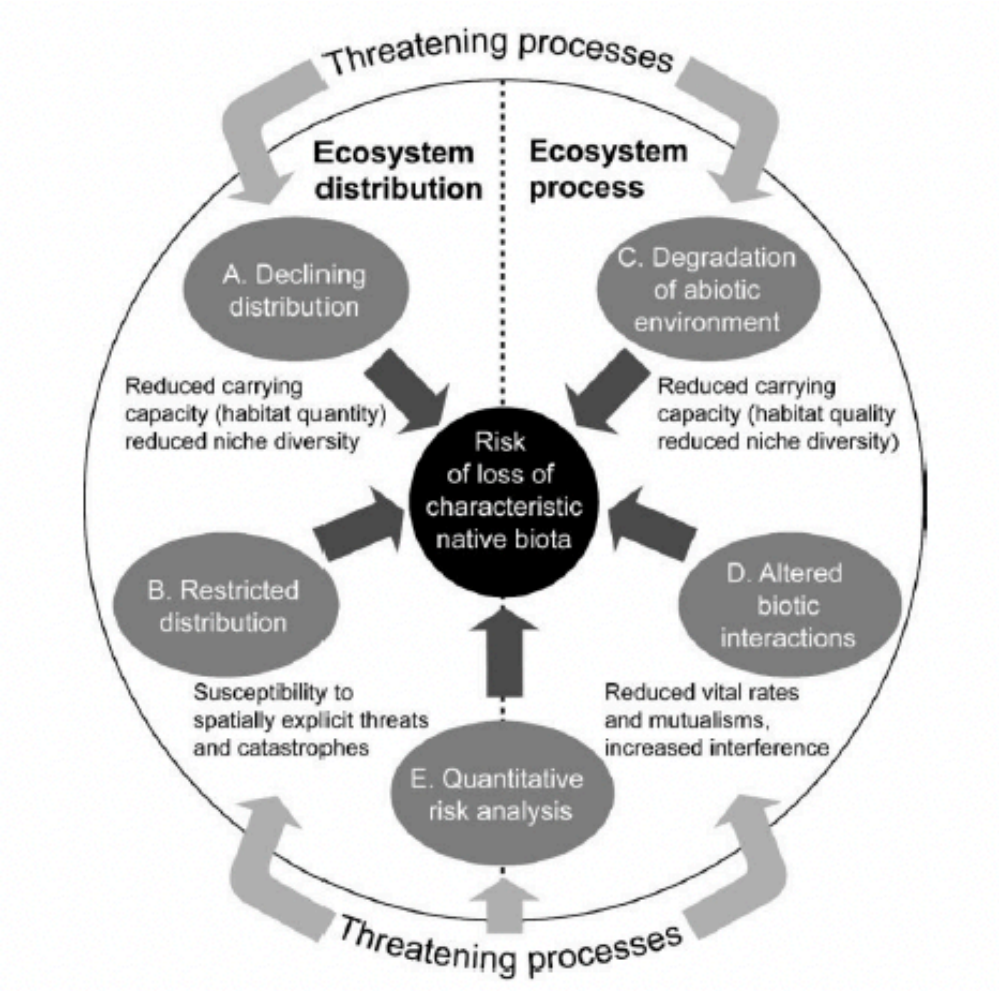

Figure 3: The IUCN Red List of Ecosystems risk assessment model. Source: (L. Bland et al. 2017).

nearly a decade of scientific work focused on understanding pathways of ecosystem decline, degradation, loss and collapse (Nicholson, Keith, and Wilcove 2009; Rodríguez et al. 2011, 2015; D. A. Keith et al. 2013, 2015; L. M. Bland et al. 2017; Murray et al. 2017, 2018; D. A. Keith, Akçakaya, and Murray 2018). Importantly, they relate the symptoms of ecosystem decline with the risk that an ecosystem will lose its defining features. The five criteria were designed to target different symptoms of ecosystem collapse (Figure 3). These symptoms are both distributional and functional:

- **Criterion A**: declines in distribution, which reduce carrying capacity for dependent biota;
- **Criterion B**: restricted distribution, which predisposes the system to spatially explicit threats;
- **Criterion C**: degradation of the abiotic environment, reducing habitat quality or abiotic niche diversity for component biota; and
- **Criterion D**: disruption of biotic processes and interactions
- **Criterion E**: allows for the integration of the above four symptoms into a simulation model of ecosystem dynamics to allow quantitative estimates of the risk of ecosystem collapse.

For further information on the criteria refer to the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (L. Bland et al. 2017).

Categories

Applying thresholds (decision rules) for each of the IUCN RLE criteria enables each ecosystem to be assigned to a category of risk ('status'). An ecosystem assessed under the RLE criteria can be placed into eight categories: Collapsed (CO), Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD), and Not Evaluated (NE, Figure 2).

The first six categories (CO, CR, EN, VU, NT and LC) are ordered in decreasing risk of collapse. The categories Data Deficient and Not Evaluated do not indicate a level of risk. For further details of the categories refer to the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (L. Bland et al. 2017). We applied version 2.2 of the IUCN Red List of Ecosystems Criteria (Table 1.1).

⚠ TODO: Add Table 1.1

The IUCN Red List of Ecosystems Criteria, Version 2.2. Source: (L. Bland et al. 2017).

Assessment process

Application of the IUCN Red List of Ecosystems Categories and Criteria follows a generic sequential process that includes:

- Adapting the newly developed global ecosystem typology (D. A. Keith et al. 2020; D. Keith et al. 2022) to the area of assessment (Myanmar's terrestrial environment, Figure 1). This process is guided by experts and the result is a list of ecosystem types for the area of assessment that will be assessed under the RLE protocol;
- Describing each of the ecosystem types in ecosystem typology following the standard approach detailed in the Guidelines for the application of IUCN Red List of Ecosystems Categories and Criteria (L. Bland et al. 2017);
- If no map data is available to support the assessment, an ecosystem mapping project is required to support the ecosystem descriptions and assessment of several of the RLE criteria;
- Applying the assessment criteria to each ecosystem type, which requires extensive data searches and analyses. The outcome of each ecosystem assessment consists of a status of the ecosystem under 5 criteria and 18 subcriteria of the IUCN Red List of Ecosystems categories and criteria;
- Compiling the results into a comprehensive IUCN Red List of Ecosystems for the area of assessment (this report), which describes each ecosystem and identifies ecosystems according to their risk of collapse.

This report details each of these steps in the following sections.

Terrestrial Ecosystems of

Bland, LM, DA Keith, RM Miller, NJ Murray, and JP Rodríguez. 2017. "Guidelines for the Application of IUCN Red List of Ecosystems Categories and Criteria, Version 1.1." *International Union for the Conservation of Nature, Gland, Switzerland*.

Bland, Lucie M, Tracey J Regan, Minh Ngoc Dinh, Renata Ferrari, David A Keith, Rebecca Lester, David Mouillot, Nicholas J Murray, Hoang Anh Nguyen, and Emily Nicholson. 2017. "Using Multiple Lines of Evidence to Assess the Risk of Ecosystem Collapse." *Proceedings of the Royal Society B: Biological Sciences* 284 (1863): 20170660.

Keith, DA, JR Ferrer-Paris, E Nicholson, MJ Bishop, BA Polidoro, E Ramirez-Llodra, et al. 2022. "Earth's Ecosystems: A Function-Based Typology for Conservation and Sustainability." *Nature* 610: 513–18.

Keith, David A, H Resit Akçakaya, and Nicholas J Murray. 2018. "Scaling Range Sizes to Threats for Robust Predictions of Risks to Biodiversity." *Conservation Biology* 32 (2): 322–32.

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Keith, David A, Jon Paul Rodríguez, Thomas M Brooks, Mark A Burgman, Edmund G Barrow, Lucie Bland, Patrick J Comer, et al. 2015. "The IUCN Red List of Ecosystems: Motivations, Challenges, and Applications." *Conservation Letters* 8 (3): 214–26.

Keith, David A, Jon Paul Rodríguez, Kathryn M Rodríguez-Clark, Emily Nicholson, Kaisu Aapala, Alfonso Alonso, Marianne Asmussen, et al. 2013. "Scientific Foundations for an IUCN Red List of Ecosystems." *PLOS One* 8 (5): e62111.

Murray, Nicholas J, David A Keith, Lucie M Bland, Renata Ferrari, Mitchell B Lyons, Richard Lucas, Nathalie Pettorelli, and Emily Nicholson. 2018. "The Role of Satellite Remote Sensing in Structured Ecosystem Risk Assessments." *Science of the Total Environment* 619: 249–57.

Murray, Nicholas J, David A Keith, Lucie M Bland, Emily Nicholson, Tracey J Regan, Jon Paul Rodríguez, and Michael Bedward. 2017. "The Use of Range Size to Assess Risks to Biodiversity from Stochastic Threats." *Diversity and Distributions* 23 (5): 474–83.

Nicholson, Emily, David A Keith, and David S Wilcove. 2009. "Assessing the Threat Status of Ecological Communities." *Conservation Biology* 23 (2): 259–74.

Rodríguez, Jon Paul, David A Keith, Kathryn M Rodríguez-Clark, Nicholas J Murray, Emily Nicholson, Tracey J Regan, Rebecca M Miller, et al. 2015. "A Practical Guide to the Application of the IUCN Red List of Ecosystems Criteria." *Philosophical Transactions of the Royal Society B: Biological Sciences* 370 (1662): 20140003.

Rodríguez, Jon Paul, KATHRYN M RODRÍGUEZ-CLARK, Jonathan EM Baillie, Neville Ash, John Benson, Timothy Boucher, Claire Brown, et al. 2011. "Establishing IUCN Red List Criteria for Threatened Ecosystems." *Conservation Biology* 25 (1): 21–29.