Impacts of the IUCN Red List of Ecosystems on conservation policy and practice

International bodies and policies, including the Convention on Biological Diversity and the United Nations Sustainable Development Goals, increasingly recognize the importance of conserving ecosystems to sustain biodiversity and dependant human well-being. In 2014, the International Union for Conservation of Nature (IUCN) adopted new global criteria for ecosystem assessment – the Red List of Ecosystems (RLE). The Red List of Ecosystems evaluates the risk of ecosystem collapse by measuring ecosystem loss and degradation in terrestrial, marine and freshwater ecosystems, and complements the IUCN Red List of Threatened Species. The Red Lists are assumed to have positive impacts on conservation; here we demonstrate the impact of the RLE on conservation policy and practice.

We used an established impact evaluation framework to identify and quantify the impacts of the RLE since its inception, distinguishing inputs, activities, outputs, from medium-term outcomes and long-term impacts. These are summarized in Figure 1, with key outcomes and impacts highlighted below. We reviewed all ecosystem assessments to June 2019, differentiating between *systematic* assessments, in which all ecosystem types within an area (e.g. a country) are assessed to inform relative risks and spatial planning, and *strategic* assessments, which are detailed diagnostic assessments targeting one or few ecosystem types to develop management strategies. We reviewed 31 systematic and 36 strategic assessments.

Outcomes and Impacts of the RLE

We found substantial outcomes and impacts since adoption as the global standard by the IUCN. In June 2019, >2000 ecosystems had been assessed in 100 countries across all continents (Figure 2); this has now increased to >4000 ecosystems. Systematic assessments are complete or underway in 50 countries and two continental regions (the Americas and Europe), representing >50% of the earth's land surface. Most have already produced new or revised ecosystem classifications and maps. Countries that previously used their own methods to assess their ecosystem now use the RLE (e.g., South Africa and Finland), while other countries are developing their first Red Lists (e.g., Colombia and Chile). Specific examples of **impact** include:

- *Government regulation*: Countries that have ecosystem red lists in their legislative and regulatory instruments include Australia, Norway, South Africa and Finland. The presence of threatened ecosystems can act as direct regulatory triggers for legal protection and changes to land-use planning. For example, in Australia, the assessment of the Coastal Upland Swamps as Endangered influenced legal protection and government recommendations for changes to the design of proposed mines.
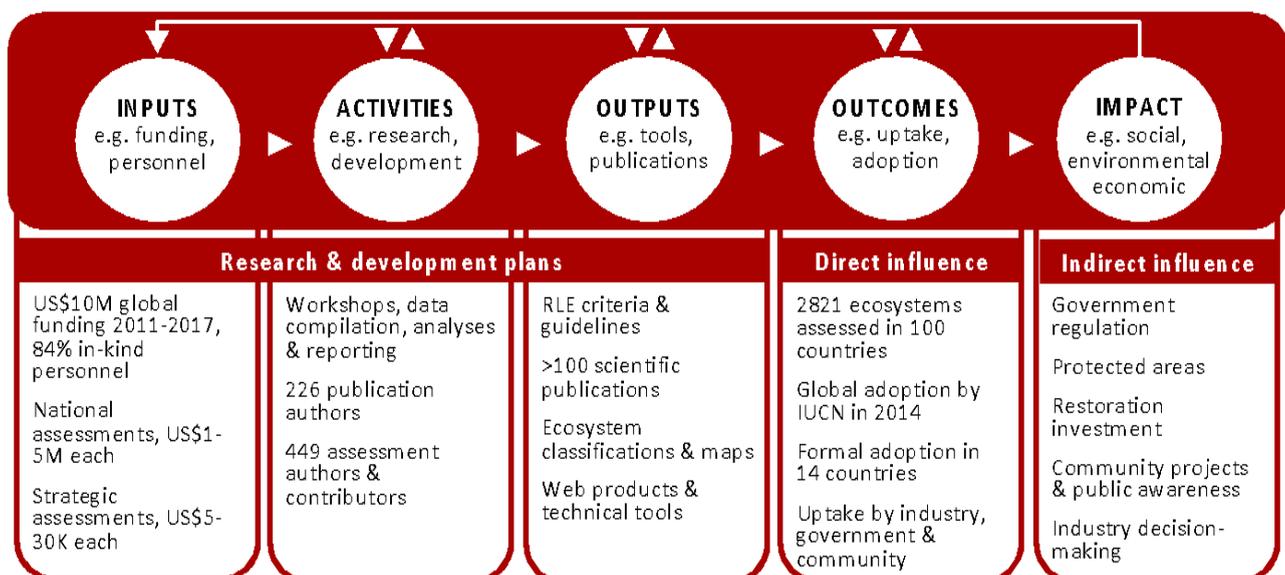

Figure 1. *Impact evaluation of the IUCN Red List of Ecosystems (from Bland et. al. 2019)*

- *Protected area planning and management*: In South Africa and Colombia, protected area expansion aims to increase the representation of threatened ecosystems, while in Australia and South Africa, Endangered and Critically Endangered ecosystems must be including in bioregional planning.

- *Restoration investment*: Examples of restoration investments from RLE data are found in France, Finland, South Africa, Australia and Chile. The Chilean RLE was used to assess the severity of fire impacts and inform priorities for forest restoration, particularly on private land. The red listing of the Coastal Upland Swamps in Australia required mining companies to restore swamps degraded by underground mining and funding research to support future conservation and restoration efforts.

- *Community projects and sociocultural impacts:* In Norway, the listing of Coastal Heaths as Endangered has resulted in high levels of community engagement to safeguard the ecosystem, dependent on traditional land-use practices since the Bronze Age; Coastal Heaths are now a priority ecosystem type under the Norwegian Nature Diversity Act. A co-benefit of systematic RLE assessments has been the establishment of long-lasting expert networks in Finland and South Africa across institutions.

- *Public awareness and reporting*: Information on threatened ecosystems is used in national environmental reporting (for example, in South Africa and Colombia). RLE data supports international obligations, such as National Biodiversity Strategy and Action Plans under the Convention on Biological Diversity (CBD) (e.g. in Norway), and European Union (EU) Habitats Directive Reporting and the EU Biodiversity Targets for 2020 (e.g. Finland). Indicators based on RLE data have been developed to compile assessment data for reporting towards the CBD and the UN Sustainable Development Goals.

- *Industry decision making:* In Colombia, the RLE has been included in a decision-support tool for industry (www.tremarctoscolombia.org) that allows development projects (e.g., road, energy and mining) to account for threatened ecosystems, including calculating offsets for immitigable impacts. The Critically Endangered assessment of the Mountain Ash forest in Australia saw an industry taskforce established on timber production, job security, and conservation. In Norway, the RLE serves as an important input for timber certification schemes. The International Finance Corporation recommends RLE as a performance standard to sustain biodiversity, ecosystem services and living natural resources.

The Red List of Ecosystems has already had tremendous impacts in the countries where it has been implemented. To fully harness its power over the coming decades, will require more assessments, collaborations, and conservation action. A 'wall-to-wall' map of threatened ecosystems on earth is currently underway, while national assessments continue to develop, providing multiple scales of information fitted to a range of purposes. The RLE can provide critical information on sustainable development and human well-being, which all depend on healthy ecosystems.
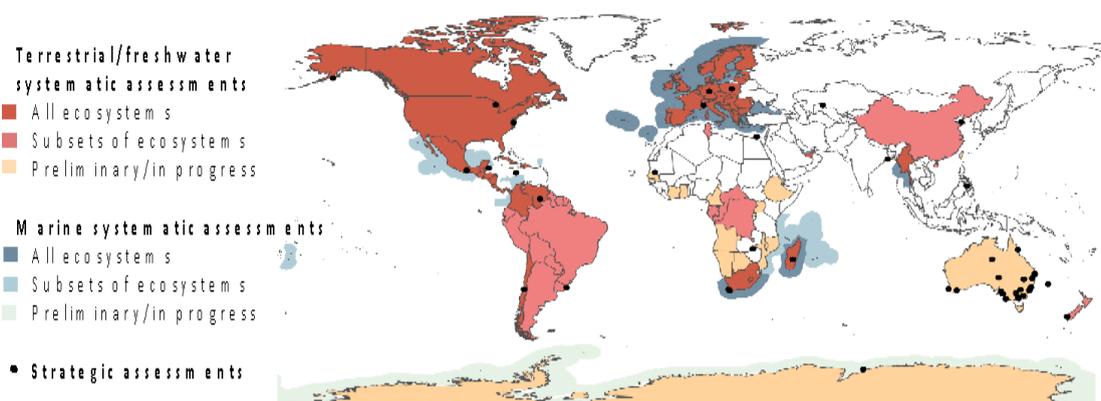
Figure 2. IUCN Red list of Ecosystems assessments to June 2022; systematic assessments include all ecosystems in country, region or broad ecosystem type (e.g. all forests), while strategic assessments target one of a few ecosystems.

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Bland LM, Nicholson E, Miller RM, Andrade A, Carre A, Etter A, Ferrer-Paris JR, Herrera B, Kontula T, Lindgaard A, Pliscof P, Skowno A, Valderrabano M, Zager I & Keith DA (2019) Impacts of the IUCN Red List of Ecosystems on Conservation Policy and Practice. *Conservation Letters*, https://doi.org/10.1111/conl.12666