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The Sampled Red List Index for Plants project was designed and undertaken as a contribution to the work of the Convention on Biological Diversity (CBD) and its Global Strategy for Plant Conservation, the Global Partnership for Plant Conservation, the Consortium of Scientific Partners to the CBD, and its Global Databank, and the Biodiversity Indicators Partnership.

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Funded by:
Safeguarding our future

This report provides the baseline against which future changes can be tracked – and it shows clearly that urgent action is needed if we are to avoid losing one in five of our plant species.

We now have a snapshot of the current status of plant diversity, but these species will need to be regularly re-assessed if we are to truly understand the changing status of the world’s plants, and indeed global biodiversity overall. Targeted fieldwork will be essential to update our information, especially for those plants whose status is declining rapidly as their environment is changing.

For the second phase of the IUCN Sampled Red List Index for Plants, we will mobilise a global network of local botanists, botanic gardens and conservationists to establish an international, broad-based monitoring scheme. As the project also relies heavily on herbarium specimen data, many major natural history collections and governments also have a big role to play – all providing input that will be crucial for monitoring future trends in the status of global plant diversity.

We need your help and support if we are to coordinate such an extensive network of botanists and conservationists – please join us in working to ensure that one in five plant species are not lost, and help safeguard a sustainable and harmonious future for us and future generations.

For more information on supporting the work of the Sampled Red List Index for Plants, please contact:

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We need to redouble our efforts and recruit more people and resources to take action for plants before it is too late.

The world cannot afford to lose one in five of its plant species; we must all work together to conserve what we have.
The IUCN Sampled Red List for Plants – the story so far

Every year some 2,000 new plant species are described and the biodiversity of many parts of the world, especially in the remotest regions, remains poorly known. In a collaborative effort between world-renowned scientific institutions, the IUCN Sampled Red List Index for Plants project gives, for the first time, an accurate view of how plants are threatened across the world. It represents the first phase of an ongoing project to monitor the status of the world’s plants.

Key findings:

- One in five plants are threatened with extinction
- Tropical rainforest contains the highest number of threatened species
- Gymnosperms (the plant group including conifers and cycads) are the most threatened group
- About a third of plants are so poorly known that we still do not know whether or not they are threatened
- The impact of humanity far outweighs natural threats to plant species, accounting for 81% of threats
- The single greatest threat is conversion of natural habitats to agricultural use, directly impacting 33% of threatened species

Discover the state of plantlife worldwide
www.kew.org/plants-at-risk

Five major groups of plants have been included in the Sampled Red List Index for Plants:

- bryophytes (mosses and liverworts)
- pteridophytes (ferns and allied species)
- gymnosperms (conifers, cycads and related species)
- monocotyledons (includes orchids, bulbs, palm trees and the grass family)
- legumes (the family of peas and beans)
What is the Sampled Red List Index?

The IUCN Red List evaluates the risk of extinction that a species faces, according to a set of rigorous criteria. It forms the world’s most authoritative and comprehensive catalogue of threatened species.

Each species is assessed to see if it is threatened with extinction. Based on these criteria, each species is assigned a category ranging from Critically Endangered (very close to extinction) to Least Concern (under no or very little risk of extinction), or Data Deficient if there is not enough information to assess the status of the species reliably.

The Problem:

Only about 4% (14,582) of the estimated 380,000 plant species are currently on the IUCN Red List, and the majority of those have been assessed because they were already thought to be threatened. This gives a skewed view of the overall conservation status of plants.

The Solution:

By assessing a randomly selected sample of all plant species we get a picture of the overall threat status for each major group (see page 5), without having to assess every species. A sample of 1,500 species per group gives a wide enough selection to be representative of all plants and lets us understand the overall picture. The result is the IUCN Sampled Red List Index.

From Darwin to Google: assessing if a plant is threatened with extinction

The best source of information on the location and range of a species is held in the world’s herbaria – scientific collections of preserved plant specimens. The herbarium collections at the Royal Botanic Gardens, Kew contain some eight million plant and fungal specimens, and the Natural History Museum contains six million plant specimens. These specimens have been collected by thousands of botanists (including Charles Darwin) over hundreds of years, from all over the world. Using information about a species from botanical literature, from analysis using Geographical Information Systems (GIS), satellite images in Google Earth and scientific expert opinion, it is possible to assess a species’ conservation status and assign it a Red List category.

Compare the level of threat facing different plant groups www.kew.org/plant-groups-at-risk.

Extinct (EX)  Extinct in the Wild (EW)  THREATENED
Critically Endangered (CR)  Endangered (EN)  Vulnerable (VU)
Near Threatened (NT)  Least Concern (LC)  Data Deficient (DD)

VU

Paphiopedilum mastersianum
(Orchidaceae) – Monocotyledon

VULNERABLE
This orchid has only been recorded on three Moluccan Islands in Indonesia, and these remote islands have been subject to human disturbances such as agriculture and forest clearance. The orchid prefers steep slopes in moderate shade and, as such, is prone to disturbance from forest clearance and soil erosion.

LC

Vicia faba
(Leguminosae) – Legume

LEAST CONCERN
The exact origin of Vicia faba, the broad bean, is unknown, but it is believed to be native to North Africa and South West Asia. This legume has been introduced and naturalised worldwide, with a long tradition of cultivation.
Current status of plants

One in five of the world’s plants are threatened with extinction.

A further 8% of species are classified as **Near Threatened**, which means they are not yet threatened but may become so without conservation actions.

### Percentage of species threatened with extinction for the five major plant groups

- **20%** bryophytes
- **13%** pteridophytes
- **39%** gymnosperms
- **19%** monocotyledons
- **14%** legumes

### Plants in comparison with other organisms

- Plants are more threatened than birds
- Plants are as threatened as mammals
- Plants are currently not as threatened as amphibians

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**Pressure on plants**

Plants are fundamental in providing ecosystem services – the benefits that people obtain from well-functioning ecosystems.

Plants absorb almost 20% of fossil fuel emissions. This hidden ecosystem service will be greatly affected by impending land-use change.

Clearing and burning of tropical forest also accounts for 20% of global carbon emissions.

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**Zamia pygmaea**

*(Zamiaceae) – Gymnosperm*

**CRITICALLY ENDANGERED**

This cycad is endemic to western Cuba and the Isla de la Juventud, and is found in dry brush, pine forests and areas of pure white sand. This plant is Critically Endangered, as its population is severely fragmented with just four subpopulations remaining. Due to its small population size it is considered that successful reproduction is limited.

**Asplenium hemionitis**

*(Aspleniaceae) – Pteridophyte*

**LEAST CONCERN**

*Asplenium hemionitis* is found in Spain and Portugal, North Africa and the nearby islands of the Atlantic Ocean such as the Canaries, Cape Verde Islands and Madeira; it is found in damp crevices between rocks in temperate forest, or on rocky cliffs or stone walls, along stream banks or roadside ditches, and is not currently threatened with extinction.
Where do we go from here?

For Phase I of the Sampled Red List Index we collected information on the habitat, population, threats and many other aspects of each species in order to make a Red List assessment, including maps for each species from herbarium specimens, taxonomic publications and online resources.

The map shown below combines data gathered during Phase I, highlighting levels of threat to plants in some of the tropical areas where plant diversity is greatest and the area which we will target for Phase II of the project. Species will be re-assessed in the field as part of an ongoing monitoring effort so threats to their survival can be understood, as well as the overall trend in the status of plants over time. Our work will provide an overall picture of changes to plants worldwide for the Convention on Biological Diversity “Aichi” Biodiversity Targets in 2020.
Safeguarding our future

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We now have a snapshot of the current status of plant diversity, but these species will need to be regularly re-assessed if we are to truly understand the changing status of the world’s plants, and indeed global biodiversity overall. Targeted fieldwork will be essential to update our information, especially for those plants whose status is declining rapidly as their environment is changing.

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Who carried out the assessments?

The monocotyledons and legume groups were assessed by the Royal Botanic Gardens, Kew; the pteridophytes were assessed by The Natural History Museum. For each of these groups 1,500 species were selected at random and each assessed against the IUCN Red List categories and criteria. As there are fewer than 1,500 gymnosperms all species were included, using the existing assessments of the IUCN Conifer and the IUCN Cycad Specialist Groups together with new assessments for the remaining species (Gnetaceae). A large contribution from the Missouri Botanical Garden provided preliminary results for the bryophyte group that is not presently included in the Index but is the next to be assessed.

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