Science for Saving Species

Research findings factsheet

Project 3.1

Threatened Species Recovery Hub

National Environmental Science Programme

Factsheet: A Threatened Plant Index for the Australian Capital Territory

Research in brief

This project has developed a Threatened Species Index (TSX) for Australia to assist policymakers, conservation managers and the public to better understand how population trends across Australia's threatened species are changing over time.

For the first time in Australia, the Threatened Plant Index has combined data from multiple programs to tell us how Australia's threatened plant species are faring through time, and which plant groups and regions most need help.

People can examine the trends, compare the results of different functional groups, regions, or management categories, and explore the underlying data through the TSX web-app.

Caladenia actensis.
Image: Fanny Karouta-Manasse, Australian National Botanic Gardens

Background

Nearly 1,400 plant species or subspecies are listed as threatened or extinct in Australia. Monitoring of these species plays a critical role in assessing how populations are changing over time, and helps to identify where management actions are and are not working.

Hundreds of threatened species have been monitored over the years and across the country by dozens of different government and non-government and community groups, but previously there was no way to bring all of these data together to show us the bigger picture about how different groups of species across different regions are faring over time.

Australia's Threatened Species Index (TSX) is based on the Living Planet Index, a method developed by World Wildlife Fund and the Zoological Society of London. The method enables trends from different species to be aggregated together at a national scale, as well as at other levels (e.g. for each state and territory, and for different functional groups and management categories).

Assembling all of the data is a big job and is being staged. Data and trends for threatened birds and mammals were released in 2018 and 2019, respectively. In 2020, data and trends for threatened plants have been added, and the trends for birds and mammals have been updated.

The TSX allows Australian governments, non-government organisations, stakeholders and the community to better understand and report on how large groups of threatened species are changing over time. It will also potentially enable us to better understand the performance of high-level strategies and the return on investment in threatened species recovery efforts.

More data (and species) will be added to the index as they become available each year, increasing the representativeness and robustness of the findings.

The University of Queensland Australia · Australian National University · The University of Melbourne · Charles Darwin University Australia · RMIT University · The University of Western Australia · Australian Wildlife Conservancy · UNSW Australia · Monash University · The University of Sydney · University of Tasmania

A Threatened Species Index for plants in the Australian Capital Territory

Here, for the first time, we present the Threatened Plant Index for the Australian Capital Territory, which combines monitoring data on threatened species populations from the ACT (Figure 1A).

The index includes data for taxa (meaning species and subspecies) that are Near Threatened, Vulnerable, Endangered or Critically Endangered under Australian legislation (EPBC Act) and/or internationally (on the IUCN Red List as of March 2020).

These data come from monitoring programs where plant populations have been surveyed at the same place in multiple years with a standardised method; this makes it possible to detect changes over time.

Anyone monitoring threatened plant populations in a systematic way can upload data via a data provision template on the TSX portal. Data that meet the suitability criteria will be added to the next iteration of the index.

The index itself shows the average change in the population size of threatened plant taxa compared to a baseline year. This baseline year of 1995 was chosen for the national index because very few of the ongoing monitoring programs originated before 1995. For the ACT, the baseline year has been set to 2000.

The baseline year has an index value of 1. Changes in the index are proportional—a year with a TPX value of 0.5 indicates that on average the population size of each taxa has decreased to half the size they were during the baseline year; a TPX value of 1.5 indicates that on average population sizes are 50% above the baseline year.

Corunastylis ectopa.
Image: Tom North, Australian National Botanic Gardens

Key findings: Australian Capital Territory threatened plant trends

In this first iteration the Threatened Plant Index for the Australian Capital Territory includes 6 taxa. You can find a summary of the species included by clicking "Data summary" on the TSX visualisation tool.

The overall TPX value for the ACT in 2017 is 0.97. This means that on average the size of threatened plant populations in our dataset have decreased by 3% between 2000 and 2017 (Figure 1).

While the overall index value in 2017 is 0.97, the grey cloud around it represents variability in the trends of individual species that make up the overall multi-species index (Figure 1A). It is created by randomly sampling species trends from all possible trends in the dataset 100 times, and dropping the 5 trends that are furthest from the average, resulting in a 95% "confidence limit".

Note that the species included in the index are not necessarily a representative sample of all threatened species in the Australian Capitol Territory.

Prasophyllum petilum.
Image: Fanny Karouta-Manasse, Australian National Botanic Gardens

Muehlenbeckia tuggeranong.
Image: M Fagg, Australian National Botanic Gardens

What should we know about the data?

The Australian Capital Territory TPX is based on 8 time series (defined as sites where data on taxa are recorded using the same methodology and a consistent monitoring effort though time) across 6 taxa. Data quality was maximised by 1) checking whether each dataset had been produced by standardised monitoring and 2) by sending surveys to custodians and requesting that they assess the trends produced for their datasets.

Only time series produced from standardised monitoring programs and with a minimum length of two years, collected between 2000 and 2017 inclusive, were used for index calculation. Sub-trends of the overall trend (e.g. for plant functional groups and management categories) can be calculated if data on at least three taxa are available.

The number of monitored sites and taxa that met the TPX criteria (Figure 1C) has increased since 2000 (Figure 1D).

Increasing the number of species, regions and plant groups monitored, particularly in regional gaps and for poorly represented plant groups would strengthen the representativeness of the index. Ongoing long-term monitoring programs allow for continuing capability to track changes in the relative abundance (and occurrence) of threatened and near-threatened plant species.

Monitoring data is available for a much smaller proportion of threatened plants compared with threatened birds or mammals (view the 2020 index).

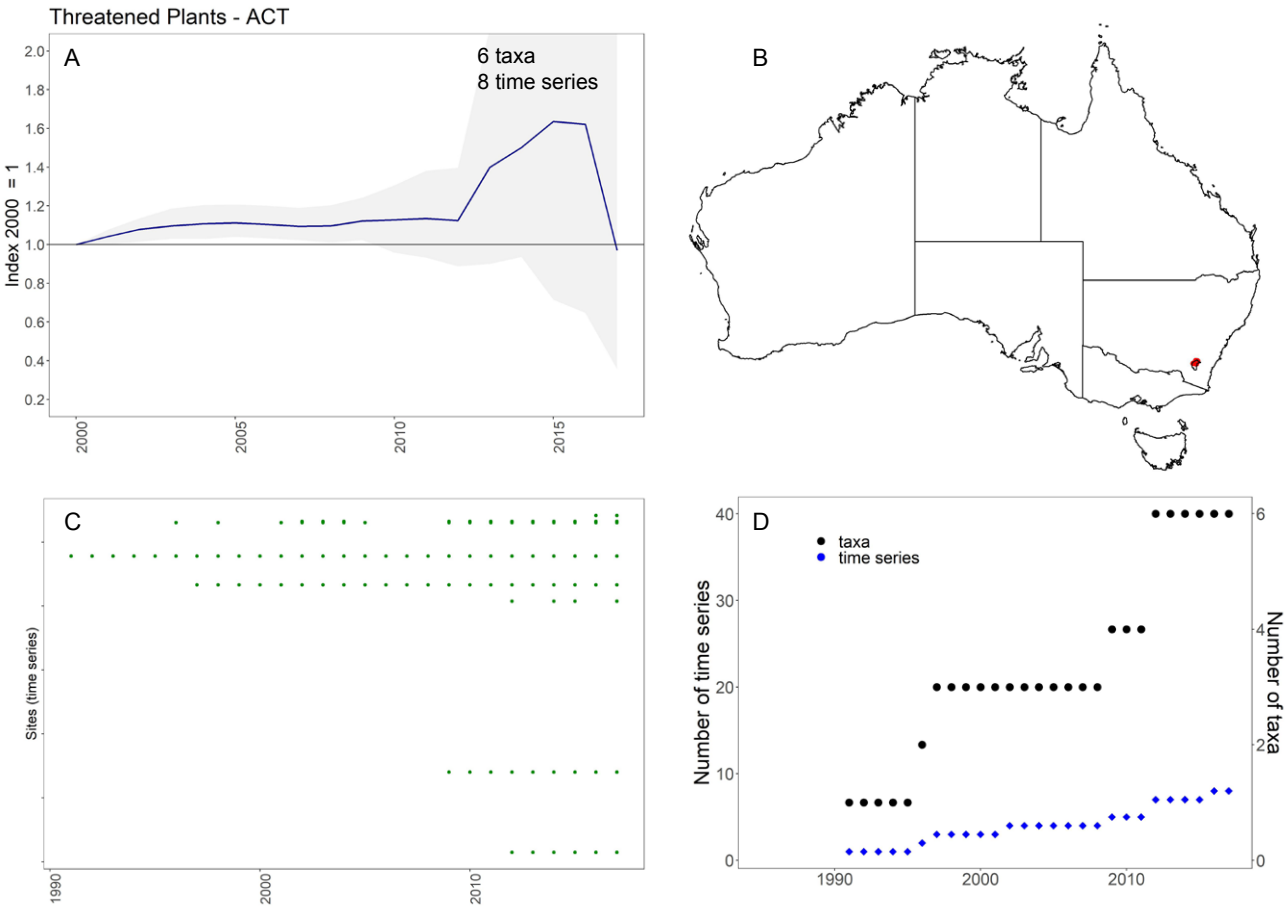

Figure 1:

A) The Australian Capital Territory Threatened Plant Index (TPX) based on all data provided on threatened and near-threatened plants. The blue line shows the change in plant abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.

B) A map showing where threatened plant data were recorded in the Australian Capital Territory. The red dots indicate repeatedly monitored fixed sites.

C) This dot plot shows the years for which monitoring data were available to compile the index. Each row represents a time series where a species was monitored with a consistent method at a single site in the Australian Capital Territory.

D) The number of species (in black circles) and number of time series (in blue diamonds) used to calculate the Australian Capital Territory index for each year.

Lepidium ginninderrense.
Image: B Clarke, Australian National Botanic Gardens

Swainsona recta.
Image: Tom North, Australian National Botanic Gardens

Further Information

For more information or to become a *Friend of the Index* and receive updates on the progress of the project please contact the TSX Team at tsx@uq.edu.au

The data underpinning the index were contributed by many different individuals and organisations, including Commonwealth, state and territory agencies, research institutions and environmental non-government organisations and consultants. Visit this web page for more information.

Go to the web-app to access and explore the data behind the TPX and to produce reports tailored to your particular needs.

This project is supported through funding from the Australian Government's National Environmental Science Program and BirdLife Australia.

Do you have monitoring data on nationally threatened species that has been collected in a standardised way and repeated through time? You can download the TSX data upload template here and upload it together with your data to be considered for next year's index here. A video tutorial on filling out the template can be viewed here.

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