2022 Threatened Species Index Factsheet: Victoria

Background

Nearly 2,000 flora and fauna 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.

In recent decades, hundreds of threatened species have been monitored across Australia by dozens of different government, non-government and community groups. Previously, however, there has been no means of bringing these data together to assess long-term trends, and to assess the status of different groups of species across different regions of Australia.

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 LPI method enables trends from different species to be aggregated together at a national scale, as well as across jurisdictional, taxonomic and other groupings (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, mammals and plants were released in 2018, 2019, and 2020 respectively. In 2021 and 2022, new data was collated and trends for each of these groups were updated.

The TSX allows Australian governments, non-government organisations, stakeholders and the community to better understand and report on how threatened species abundances are changing over time. It will also 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.

How to interpret the index?

The index itself shows the average change in the abundance of threatened species compared to a baseline year. The baseline year of 1985 was chosen for the national index because very few of Australia's monitoring programs originated before 1985. For Victoria, the baseline year has been set to 2000 due to data limits before this year.

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

The grey cloud represents variability in the trends of individual species that make up an overall multi-species index. 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".

2022 TSX for Victoria

The 2022 Threatened Species Index for Victoria includes data for 63 taxa, including 30 birds, 9 mammals and 24 plants.

The overall TSX value for Victoria in 2019 is 0.36. This means that, on average, the abundance of threatened species populations represented in the index from Victoria decreased by 64% between 2000 and 2019 (Figure 1).

In the following pages of this factsheet, we will walk you through the separate indices for threatened birds, mammals, and plants for Victoria.

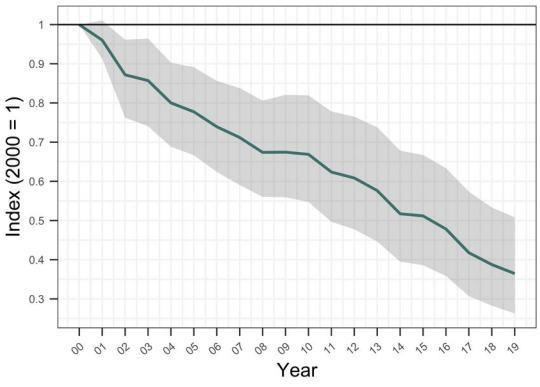

Figure 1: The Victorian 2022 Threatened Species Index based on all data provided on threatened and near-threatened species. The green line shows the change in species abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.

Threatened Birds in Victoria

VIC Bird Index - Quick Facts

Ref. year	2000
2019 index value	0.57
% change from 2000	*-43%*
Time-series	3,142
Taxa	30
Sampling years	27,506
Av. time-series length	13.64

Orange bellied parrot. JJ Harrison CC BY-SA 3.0 Wikimedia

The overall index value for threatened birds in Victoria in 2019 is 0.57. This suggests an average decline of 43% in population abundances since 2000, for the 30 bird taxa represented (Figure 2A). In the same context, the national threatened bird index reveals a decline of 50% since 2000, which is based on data for 70 taxa.

While the overall trend for Victoria's threatened birds is one of continued decline, and even hastening declines since 2015, there is considerable interspecific variation, as indicated by the wide confidence intervals in Figure 2A. Some populations are trending considerably better than the average, while others are trending considerably worse. Trends for terrestrial birds are worse than those for migratory shorebirds overall, with respective index values of 0.41 (59% decline) and 0.66 (44% decline).

The data for Victoria have the highest within-state spatial representativeness of anywhere in the country, covering all major biomes (Figure 2B). Data are relatively sparse for the Alps and Upper Murray. The number of taxa represented each year and the number of time-series increased in a roughly linear fashion from 1980, but has declined sharply in more recent years (Figure 2C and 2D). You can find a summary of the species and time-series included in this index by clicking "Data summary" on the TSX visualisation tool.

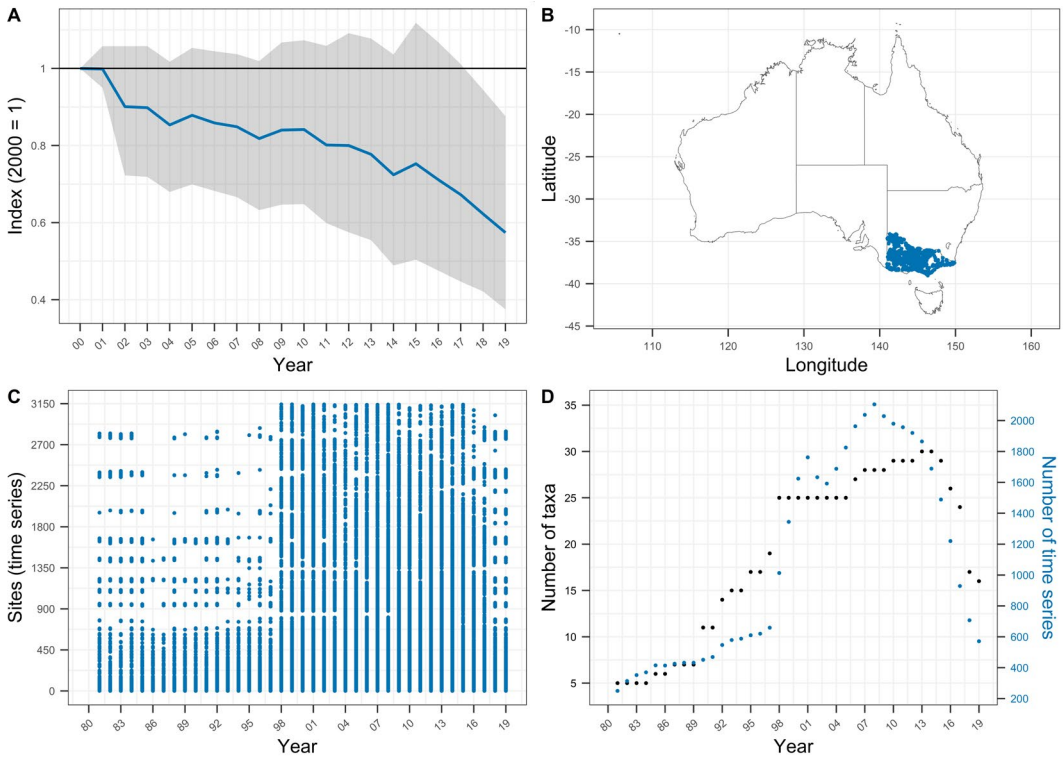

Figure 2:
A) The Victorian 2022 Threatened Bird Index based on all data provided on threatened and near-threatened birds. The blue line shows the change in bird abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
B) A map showing where the threatened bird data, submitted to the index, were recorded in Victoria. The blue dots indicate repeatedly monitored sites.
C) Dot plot showing 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 Victoria.
D) The number of species (in black circles) and number of time series (in blue circles) used to calculate the Victorian bird index for each year.

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Threatened Mammals in Victoria

VIC Mammal Index - Quick Facts

Ref. year	2000
2019 index value	0.46
% change from 2000	*-54%*
Time-series	940
Taxa	9
Sampling years	2,705
Av. time-series length	8.38

Eastern bored bandicoot. JJHarrison CC BY-SA 3.0 Wikimedia

The overall index value for threatened mammals in Victoria in 2019 is 0.46. This suggests an average decrease of 54% in population abundances since 2000, for the 9 mammal taxa represented (Figure 3A). In the same context, the national threatened mammal index reveals a decline of 26% since 2000, which is based on data for 79 taxa.

The trend for Victorian mammals represented in the TSX is one of steep, linear decline from 2002–2014, with some stabilisation of the trend since 2014 (Figure 4A). However, it is also true that data availability has declined in more recent years, particularly the number of time-series available for each year since around 2010 (Figure 4D). Notably, 889 of the 940 time-series come from 4 species: Greater Glider, Yellow-bellied Glider, Brush-tailed Phascogale and Southern Brown Bandicoot. Nevertheless, there is good spatial coverage of the range of Victoria's threatened and near-threatened mammals across southern Victoria, including the Great Dividing Range. The lack of records from the northern plains is representative of the fact that there are few threatened mammals across this bioregion (in part due to the extinction of several species in this region). You can find a summary of the species included in this index by clicking "Data summary" on the TSX visualisation tool.

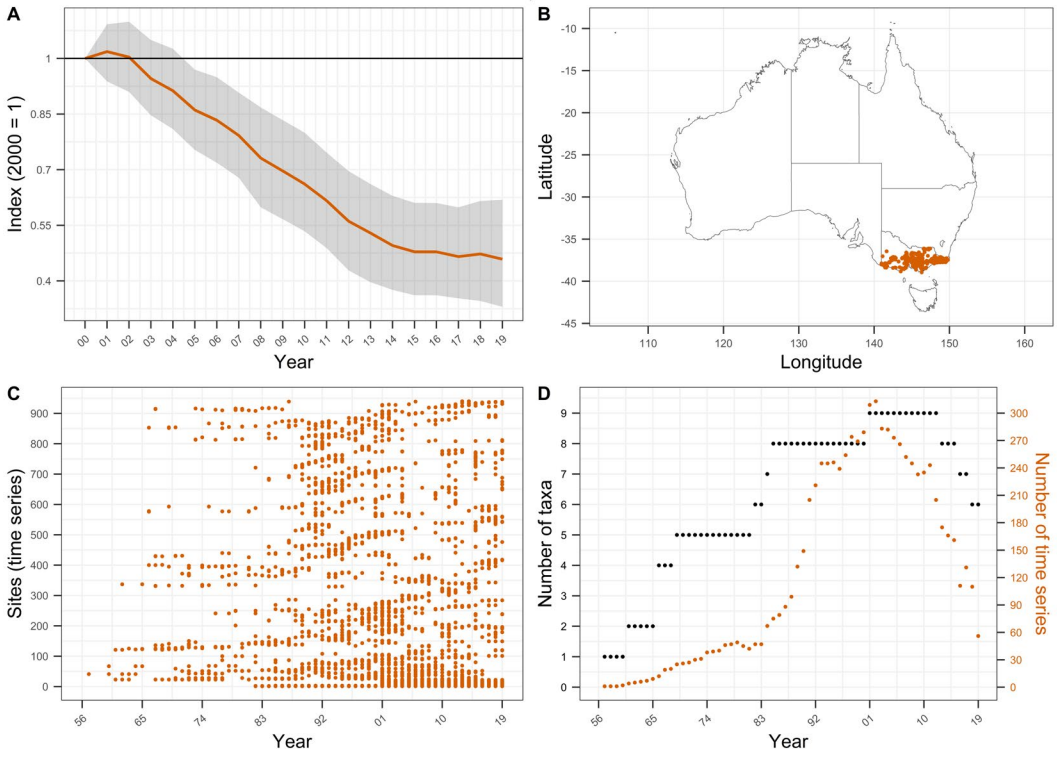

Figure 3:
A) The Victorian 2022 Threatened Mammal Index based on all data provided on threatened and near-threatened mammals. The orange line shows the change in mammal abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
B) A map showing where the threatened mammal data, submitted to the index, were recorded in Victoria. The orange dots indicate repeatedly monitored sites.
C) Dot plot showing 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 Victoria.
D) The number of species (in black circles) and number of time series (in orange circles) used to calculate the Victoria mammal index for each year.

Threatened Plants in Victoria

VIC Plant Index - Quick Facts

Ref. year	2000
2019 index value	0.16
% change from 2000	*-84%*
Time-series	155
Taxa	24
Sampling years	515
Av. time-series length	12.72

Zieria citriodora. Image: Melburnian CC BY 3.0 Wikimedia

The overall index value for threatened plants in Victoria in 2019 is 0.16. This suggests an average decline of 84% in population abundances since 2000, for the 24 plant taxa represented (Figure 4A). In the same context, the national threatened plant index reveals a decline of 77% since 2000, which is based on data for 129 taxa.

The trend for Victoria's threatened plants represented in the TSX is one of very steep and linear decline since 2000 (Figure 4A). There is some evidence of stabilisation in the trend for 2017–2019, however, the data for these years are considerably less reliable, with very few species and time-series represented (Figure 4C & D). As such, trends in these years should be treated with caution. Data for the index peaked around 2006–2007, with a steep decline in data availability since 2010 (Figure 4C & D). The data come mostly from Gippsland, Victoria's Volcanic Plains and the central Northern Plains. Herbaceous plants, particularly grassland species, are strongly represented in the index. You can find a summary of the species included by clicking "Data summary" on the TSX visualisation tool.

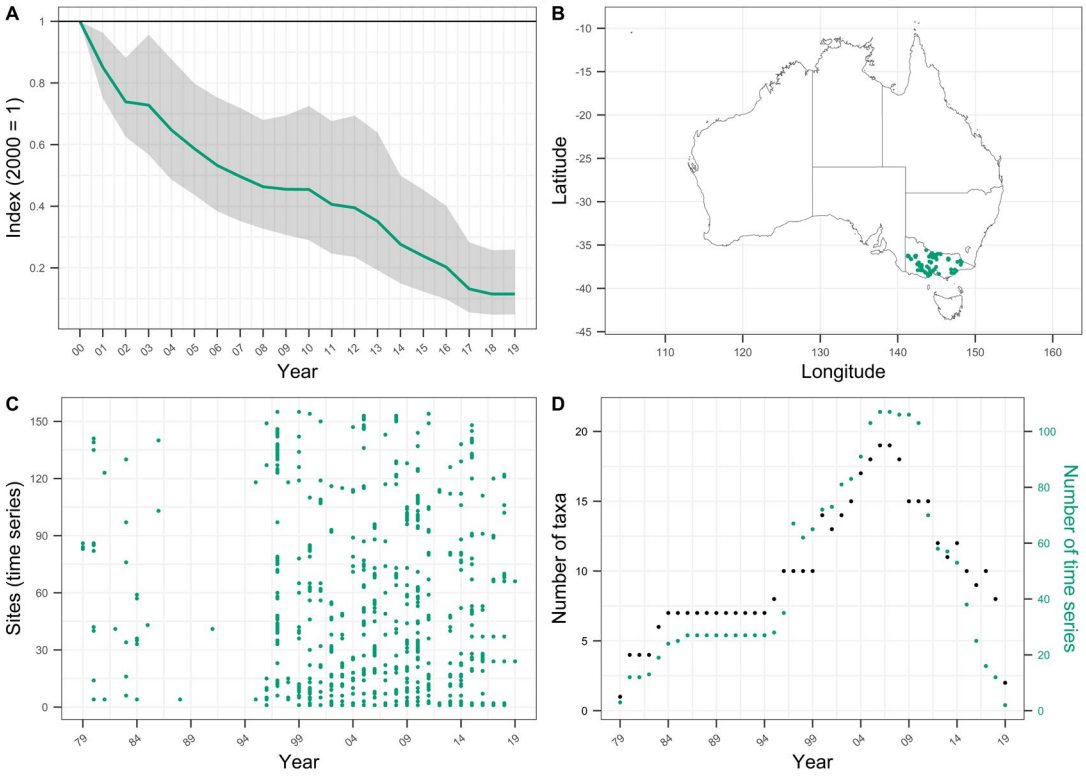

Figure 4:
A) The Victorian 2022 Threatened Plant Index based on all data provided on threatened and near-threatened plants. The green line shows the change in plant abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
B) A map showing where the threatened plant data, submitted to the index, were recorded in Victoria. The green dots indicate repeatedly monitored sites.
C) Dot plot showing 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 Victoria.
D) The number of species (in black circles) and number of time series (in green circles) used to calculate the Victoria plant index for each year.

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What should we know about the data?

- The TSX includes species listed as threatened or near-threatened under both the EPBC Act and the IUCN Red List. State- and territory-based assessments are not yet incorporated into the index.
- The composite indices presented in this factsheet are based only on data provided by our custodians endeavouring to meet the TSX suitability criteria. For example, only time series produced from standardised monitoring programs and with a minimum length of two years, collected between 2000 and 2019 inclusive, were used for index calculation.
- To ensure that species trends are suitable for inclusion in the index, feedback surveys are sent to each TSX data custodian requesting that they assess the time series data and trends produced from their dataset.
- When interpreting the index, it is important to consider the proportional representation of the threatened and near-threatened taxa included, as well as the spatial and temporal coverage of the time-series data. The reliability of the trend at any point in time is directly related to coverage and quantity of underlying data.
- The data on spatial and taxonomic representativeness can be useful for identifying strategic monitoring opportunities Increasing the number of species, regions and groups monitored, particularly in regional gaps and for poorly represented groups, will strengthen the representativeness of the index.

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@tern.org.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 2022 TSX and to produce reports tailored to your particular needs.

The TSX is supported through funding from the Terrestrial Ecosystem Research Network (an NCRIS enabled facility) and the Australian Government's Department of Climate Change, Energy, the Environment and Water.

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.

www.tsx.org.au
E tsx@tern.org.au | @AusTSX | The University of Queensland, Long Pocket Precinct, Level 5 Foxtail Bld #1019 | 80 Meiers Rd, Indooroopilly QLD 4068 Australia

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