

2022 Threatened Species Index Factsheet: New South Wales and Australian Capital Territory

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 New South Wales and the Australian Capital Territory, 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 New South Wales and Australian Capital Territory

The 2022 Threatened Species Index for New South Wales and Australian Capital Territory includes data for 95 taxa, including 34 birds, 17 mammals and 44 plants.

The overall TSX value for NSW and the ACT in 2019 is 0.38. This means that, on average, the abundance of threatened species populations represented in the index from these jurisdictions has decreased by 62% 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 NSW and the ACT.

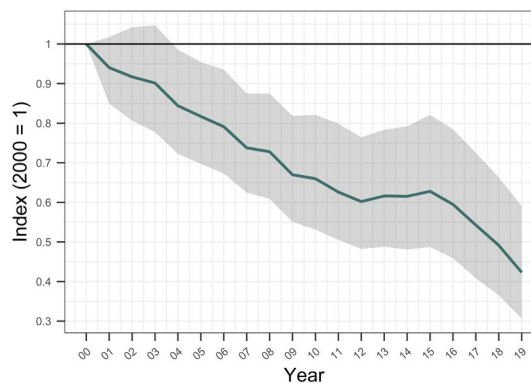


Figure 1: The New South Wales and Australian Capital Territory 2022 Threatened Species Index based on all data provided on threatened and near-threatened species. The green line shows the change in species abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud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

Threatened Birds in New South Wales and Australian Capital Territory

NSW+ACT Bird Index - Quick Facts	
Ref. year	2000
2019 index value	0.36
% change from 2000	-64%
Time-series	2,396
Taxa	34
Sampling years	20,129
Av. time-series length	12.68



The overall index value for threatened birds in New South Wales and Australian Capital Territory in 2019 is 0.36. This suggests an average decline of 64% in population abundances since 2000, for the 34 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.

The overall trend for threatened birds in the New South Wales and Australian Capital Territory is one of continued decline (Figure 2A). Declines were steep and linear between 2000 and 2011, with some stabilisation between 2012 and 2016. However, data acquired since 2016 suggest continued declines through to 2019. The most recent declines are mostly attributed to terrestrial birds (-65% since 2000), with some stabilisation apparent in the trends for shoreline (migratory) birds (at around -58% since 2000).

The data for New South Wales and the Australian Capital Territory are concentrated in the east of the combined area of these jurisdictions, with less data from western NSW (Figure 2B). The number of available time-series increased exponentially from the mid 1980s, but has declined steeply in recent years (Figure 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](#).

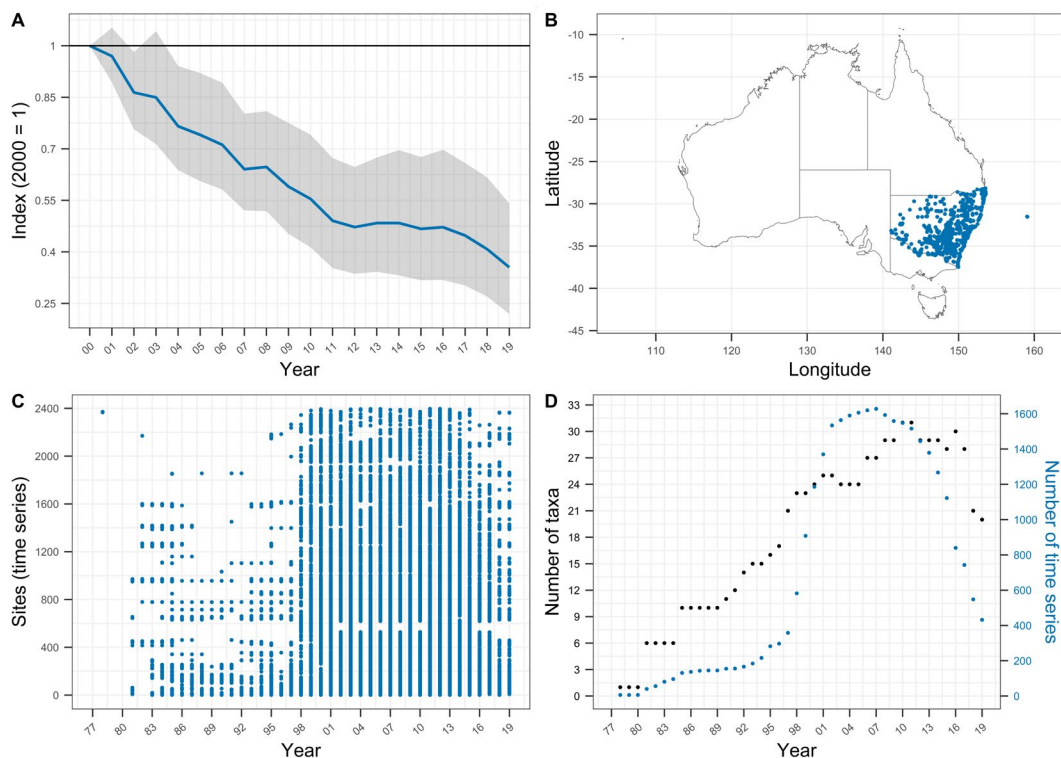


Figure 2:
 A) The New South Wales and Australian Capital Territory 2022 Threatened Bird Index. The blue line shows the change in bird abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
 B) A map showing where the threatened bird data, submitted to the index, were recorded in NSW and the ACT. 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 NSW and the ACT.
 D) The number of species (in black circles) and number of time series (in blue circles) used to calculate the NSW and ACT bird index for each year.

Threatened **Mammals** in New South Wales and Australian Capital Territory

NSW+ACT Mammal Index - Quick Facts

Ref. year	2000
2019 index value	0.84
% change from 2000	-16%
Time-series	267
Taxa	17
Sampling years	1532



The overall index value for threatened mammals in New South Wales and Australian Capital Territory in 2019 is 0.84. This suggests an average decrease of 16% in population abundances since 2000, for the 17 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 New South Wales and Australian Capital Territory mammals represented in the TSX entails increases in abundance from 2000 through to 2015, with declining abundance since that time (Figure 4A). However, data availability is poor through to 2010, with a peak in data availability — both in the number of species represented and time-series — between 2013 and 2019 (Figure 4C & D). There are significant spatial gaps in the dataset, with clusters of sites in the far south- and north-east of NSW, the Sydney Basin, Gunnedah and Piliga Forest and several sites in far western NSW. The extensive monitoring data from the Piliga and Gunnedah area is for one species: the Koala. No mammal time-series data are currently available from the ACT itself. You can find a summary of the species included in this index by clicking “Data summary” on the [TSX visualisation tool](#).

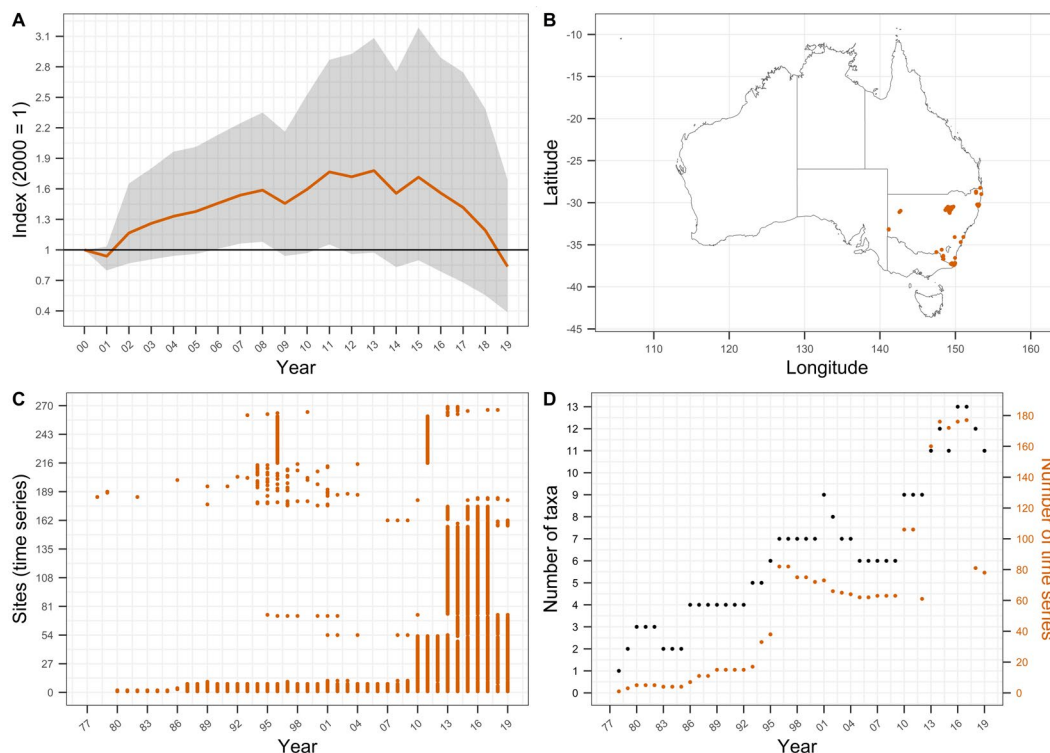


Figure 3:
 A) The New South Wales and Australian Capital Territory 2022 Threatened Mammal Index. The orange line shows the change in mammal abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
 B) A map showing where the threatened mammal data, submitted to the index, were recorded in NSW and the ACT. 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 NSW and the ACT.
 D) The number of species (in black circles) and number of time series (in orange circles) used to calculate the NSW and ACT mammal index for each year.

Threatened Plants in New South Wales and Australian Capital Territory

NSW+ACT Plant Index - Quick Facts

Ref. year	2000
2019 index value	0.40
% change from 2000	-60%
Time-series	282
Taxa	44
Sampling years	1192
Av. time-series length	6.21



The overall index value for threatened plants in New South Wales and the Australian Capital Territory in 2019 is 0.40. This suggests an average decline of 60% in population abundances since 2000, for the 44 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 threatened plants from New South Wales and Australian Capital Territory that are represented in the TSX is one of steep and linear decline from 2000 to 2009 (Figure 4A). Stabilisation and even recovery was indicated by monitoring data available from 2009–2015, however, data from the most recent years to 2019 suggests further declines (Figure 4A). The data available for estimating the trend in NSW and ACT threatened plants has increased considerably through time, with both the number of species and number of time-series included in the index increasing exponentially since the early 1990s (Figure 4C & D). Data are heavily biased to the eastern coast and ranges, however, these areas also support the most threatened species. You can find a summary of the species included by clicking “Data summary” on the [TSX visualisation tool](#).

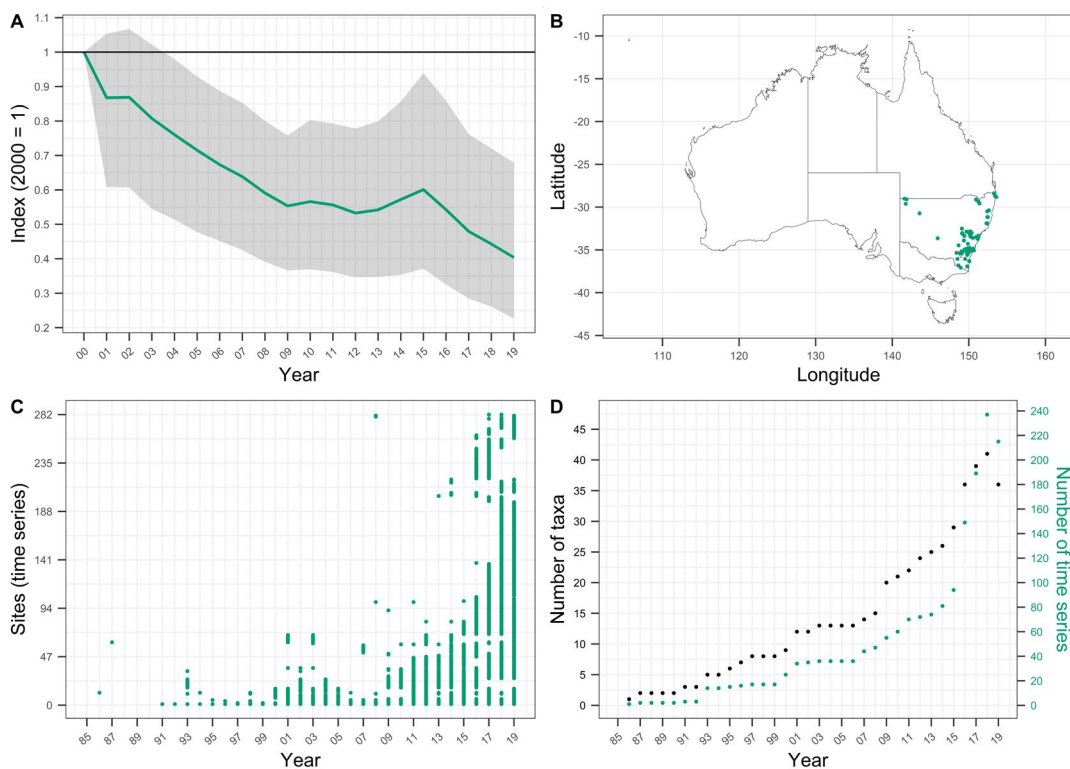


Figure 4:

- A) The New South Wales and Australian Capital Territory 2022 Threatened Plant Index. 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 NSW and the ACT. 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 NSW and the ACT.
- D) The number of species (in black circles) and number of time series (in green circles) used to calculate the NSW and ACT plant index for each year.

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](#).



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