2022 Threatened Species Index Factsheet: Western Australia

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 Western Australia, 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 Western Australia

The 2022 Threatened Species Index for Western Australia includes data for 72 taxa, including 23 birds, 24 mammals and 25 plants.

The overall TSX value for WA in 2019 is 0.58. This means that, on average, the abundance of threatened species populations represented in the index from WA decreased by 42% 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 Western Australia.

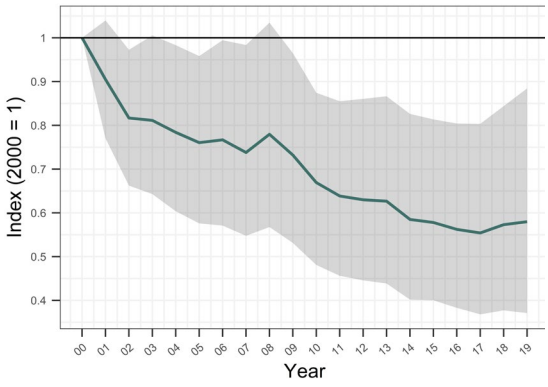

Figure 1: The Western Australian 2022 Threatened Species Index based on all data provided on threatened and near-threatened species. The green line shows the change in species abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.

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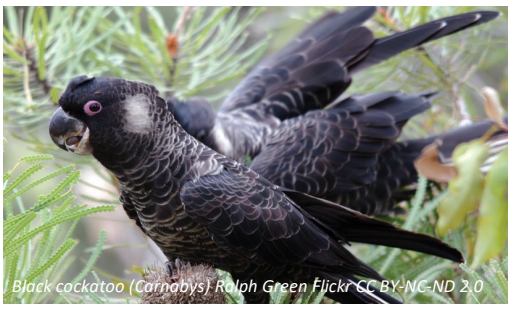
Threatened Birds in Western Australia

WA Bird Index - Quick Facts

Ref. year	2000
2019 index value	0.86
% change from 2000	***-14%***
Time-series	2,218
Taxa	23
Sampling years	16,144
Av. time-series length	13.21



The overall index value for threatened birds in Western Australia in 2019 is 0.86. This suggests an average decline of 14% in population abundances since 2000, for the 23 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.

Unsurprisingly for such a large state, with much of its area remote, there are limited monitoring data for some regions in WA. The data underlying the WA bird index have good coverage for the Perth area, south-west Kimberley, and south-central and south-west coastal areas but are marginal for the arid zone (Figure 2B). However, it is also true that fewer bird species are listed as threatened in the remote arid regions of WA.

For birds, both the number of sites and the number of taxa represented in the index from WA has substantially increased since 1992, peaking at around 2014 (Figure 2C and 2D). In combination, this has resulted in a significant increase in the time series available for calculating the index (Figure 2D). You can find a summary of the species included in this index by clicking “Data summary” on the TSX visualisation tool.

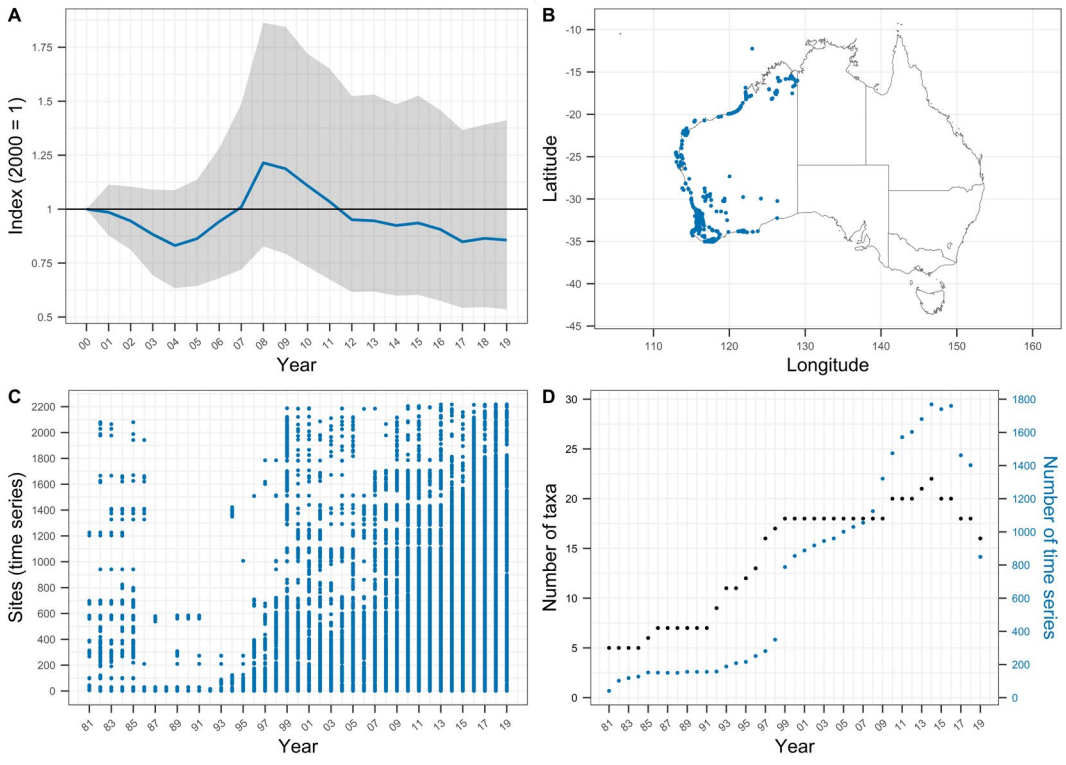


Figure 2:
A) The Western Australian 2022 Threatened Bird Index based on all data provided on threatened and near-threatened birds. The blue line shows the change in bird abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
B) A map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

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Threatened Mammals in Western Australia

WA Mammal Index - Quick Facts

Ref. year	2000
2019 index value	0.65
% change from 2000	*-35%*
Time-series	213
Taxa	24
Sampling years	1,661
Av. time-series length	11.39

Western ringtail possum, Stewart McDonald

The overall index value for threatened mammals in Western Australia in 2019 is 0.65. This suggests an average decline of 35% in population abundances since 2000, for the 24 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.

If we subset the WA mammal index to look at trends for specific groups, we see mixed results. For critical weight range mammals, we see a more severe average decline of 70% since 2000. Marine mammals, on the other hand, have increased in abundance in WA by 68% on average since 2000.

The data underlying the WA mammal index have good coverage for the south-west coast, as well as parts of the Kimberley and Pilbara, but are relatively marginal for the arid zone (Figure 3B). For mammals, both the number of sites and the number of taxa being monitored in WA has substantially increased through time, particularly since 2010 (Figure 3C and 3D). You can find a summary of the species included in this index by clicking "Data summary" on the TSX visualisation tool.

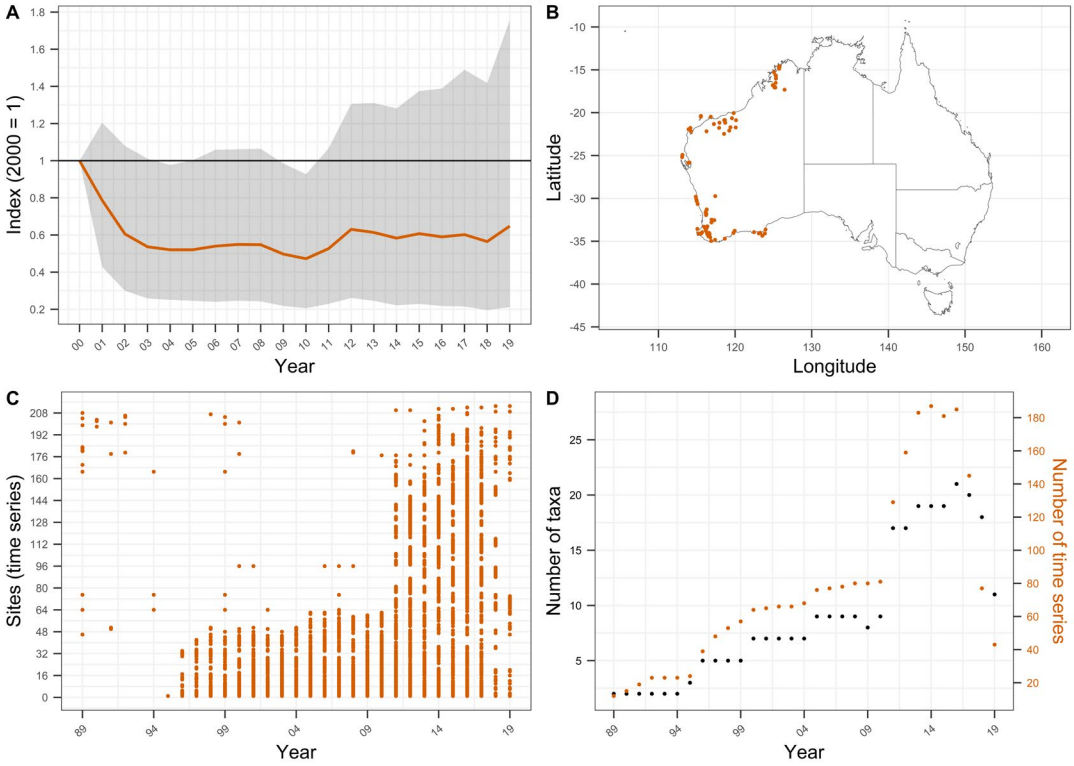

Figure 3:
A) The Western Australian 2022 Threatened Mammal Index based on all data provided on threatened and near-threatened mammals. The orange line shows the change in mammal abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.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

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Threatened Plants in Western Australia

WA Plant Index - Quick Facts

Ref. year	2000
2019 index value	0.27
% change from 2000	*-73%*
Time-series	79
Taxa	25
Sampling years	696
Av. time-series length	12.3


Adenanthos ellipticus. *Sarah Barrett*

The overall index value for threatened plants in Western Australia in 2019 is 0.27. This suggests an average decline of 73% in population abundances since 2000, for the 25 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.

These declines are steep, however, it is not all bad news for WA plants. Subsetting the WA plant index to only sites that are actively managed reveals a decline of only 18% since 2000. When compared to the index for sites with no known management, where declines average 88% since 2000, it is clear that active management is crucial for the future of WA threatened plants.

The data underlying the WA plant index derive entirely from the south-west coast (Figure 4B). For plants, both the number of sites and the number of taxa being monitored in WA has increased relatively steadily through time but data entering the index has experienced a dramatic drop off in recent years (Figure 4C and 4D). You can find a summary of the species included in this index by clicking “Data summary” on the TSX visualisation tool.

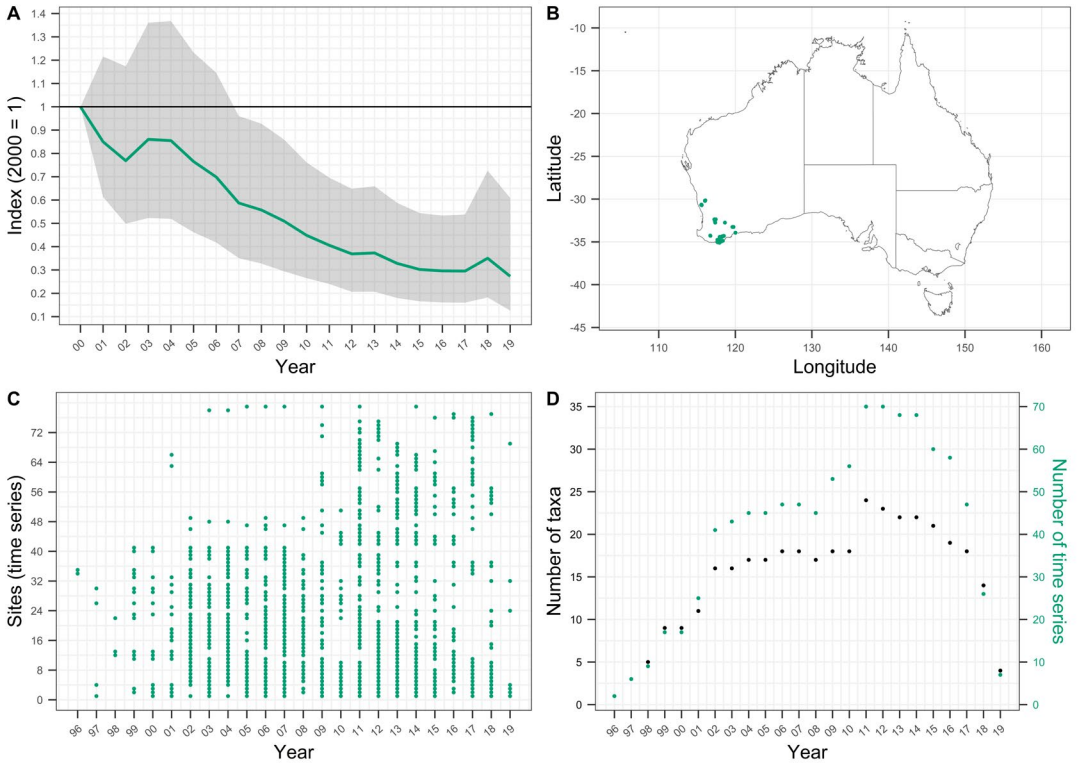

Figure 4:
A) The Western Australian 2022 Threatened Plant Index based on all data provided on threatened and near-threatened plants. The green line shows the change in plant abundance relative to the baseline year of 2000, where the index is set to 1.0. The grey cloud shows the confidence limit.
B) A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

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