

Science for Saving Species

Research findings factsheet

Project 3.1



National Environmental Science Programme

Factsheet: A Threatened Bird Index for South Australia



Research in brief

This project is developing a Threatened Species Index (TSX) for Australia which can assist policy makers, conservation managers and the public to understand how some of the population trends across Australia's threatened species are changing over time. It will inform policy and investment decisions and enable coherent and transparent reporting on relative changes in threatened species numbers across national, state and regional levels. Australia's TSX is based on the Living Planet Index (www.livingplanetindex.org), a method developed by World Wildlife Fund and the Zoological Society of London. The TSX is still in the early stages of development, but it has been designed to be a dynamic tool to which new monitoring data can be added and examined.



How can the index be used?

For the first time in Australia, an index has been developed that can provide reliable and rigorous measures of trends across Australia's nationally listed threatened species. In addition to communicating overall trends, the indices can be interrogated and the data downloaded via a **web-app** to allow trends for different taxonomic groups or regions to be explored and compared. So far, the index has been populated with data for some threatened birds, and monitoring data for threatened plants are being assembled and threatened mammals are planned next.

By bringing together monitoring data, these indices will allow Australian governments, non-government organisations, stakeholders and the community to better understand and report on trends for threatened species groups including which are decreasing, increasing or staying stable. It will potentially enable us to better understand the performance of high-level strategies and the return on investment in threatened species recovery, and inform our priorities for future investment.

A Threatened Species Index for South Australian birds

Here, the national Threatened Bird Index (TBX) is drilled down to report on information relating to trends for threatened birds in South Australia (Figure 1A). In its first iteration, this index incorporates data from 13 nationally listed bird species or subspecies (Vulnerable, Endangered or Critically Endangered under the EPBC Act and/or as assessed by BirdLife Australia - see Table 1). More data will be added as they become available each year allowing the index to grow.

The index shows the estimated yearly change in relative abundance of threatened bird species in relation to a baseline year, for which 1985 was chosen, where the index is set to 1.0. However, later baseline years are also available to support the specific needs

of conservation managers and can be selected via the web-app. Changes in the index are proportional—a value of 0.5 indicates the multi-species relative abundance is 50% below the baseline value; a value of 1.5 indicates 50% above baseline.

In 2015, the SA TBX value given the current data is 0.08. This suggests that the relative abundance of threatened birds for which we have data has decreased by 92% between 1985 and 2015. In comparison, the national TBX shows a decrease of 52% in the compiled data. Individual species in the South Australian index have values between 0.04 (a 96% decrease) and 0.17 (a 83% decrease). When a baseline of 2000 is used, SA TBX has decreased roughly 60% compared with 40% for the national TBX.



What should we know about the South Australian data?

This index is based on 412 time series (defined as sites where data on each species are recorded using the same methodology and a consistent monitoring effort through time) across these 13 species. Data quality was maximised by 1) checking whether each dataset had been produced by standardised monitoring and 2) by sending surveys on 111 eligible datasets to custodians and requesting them to assess the trends produced for their datasets. Feedback was received for 82% of the datasets. Only time series that had been produced by standardised monitoring and with a minimum length of four years collected between 1985

and 2015 inclusive were used for index calculation. No trends are calculated for indices with datasets on less than three species.

The data underlying the SA index are mostly representative of southern and coastal habitats, particularly those in the Eyre and Yorke Peninsulas and around Adelaide and the Mount Lofty Ranges. The South Australian arid zone is poorly represented in the index (Figure 1B). The number of sites for which adequate data were available (Figure 1C) in SA has substantially increased since 1986; while the number of species with adequate data increased from three species in 1986 to 13 in 2008

(Figure 1D). In combination, this has resulted in a huge increase in the time series datasets available; from 97 in 1986 to 352 in 2008.

As more quality assured data become available, they can be added making the index more powerful, meaningful and representative. Increasing the number of species, regions and functional groups monitored should be a priority in the future. It is important that existing monitoring programs be sustained, and continue to provide data to the index, to enable us to track changes in threatened species relative abundance. BirdLife Australia have committed stewardship for the TBX-component of the TSX.

Interpretational issues and constraints

- Between 1985 and 2000, the observed decline in the South Australian bird index is dominated by declines for nationally listed migratory shorebirds. The observed declines for this group of species matches those patterns observed nationally and more broadly across the East Asian-Australasian Flyway. While local changes in habitat quality (e.g. Coorong) may be contributing to these declines, these species are under strong pressure across their range, particularly through loss of habitat in the Yellow Sea. As migratory shorebirds account for 6 out of 13 species included in this analysis, it may be masking some of the successful recoveries of species in SA such as the Kangaroo Island Glossy Black-Cockatoo.
- After 2000, comparable declines were observed for both migratory shorebirds, and terrestrial threatened birds.
- This composite index does not include data for all of South Australia's threatened bird species because monitoring programs do not exist for all species, or the data from such programs were not suitable for incorporation in the TBX. There would be scope for increasing the comprehensiveness of representation of threatened bird species, with strategically established targeted monitoring for those threatened species not currently included in the index (see Table 1), thus the index has the capacity to identify strategic monitoring opportunities.
- The index includes fewer than 10 species for the years 1985 to 1998, so trends in that period may not be readily matched to trends from later periods during which many more species were included in the composite index.
- Unsurprisingly, there are limited appropriate monitoring data for some remote regions in SA (although it is also true that fewer birds in remote regions are listed as threatened).



Young Kangaroo Island
glossy black-cockatoo males.
Photo: Daniella Teixeira

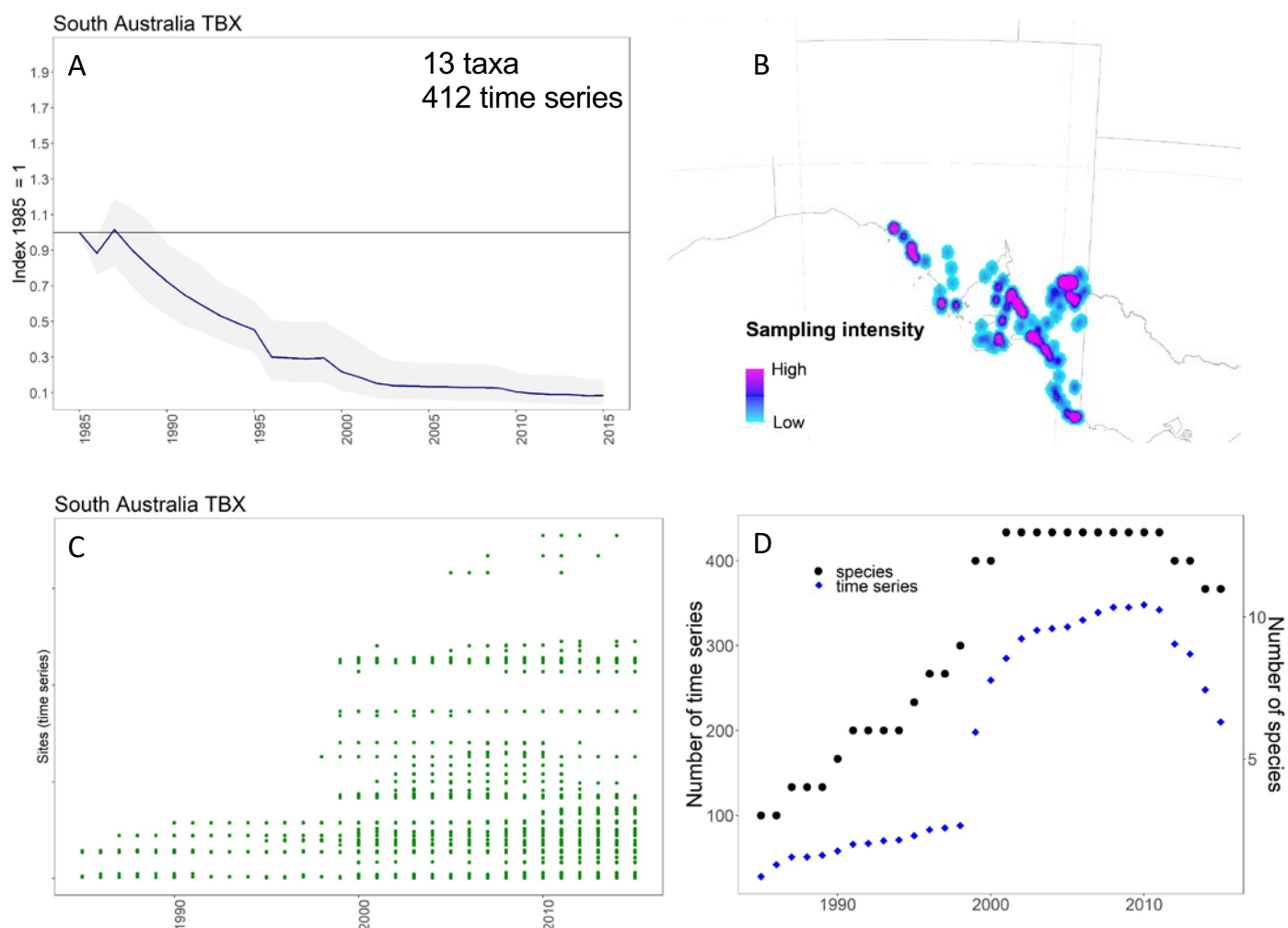


Figure 1 (above):

A) The Threatened Bird Index (TBX) for South Australia. The blue line shows the change in threatened bird abundance relative to the baseline year of 1985, where the index is set to 1.0. The grey cloud shows the range of trends for the individual species that make up the overall multi-species index. It can be seen as the variability between single-species trends that build the composite.

B) A map showing where threatened bird data were recorded in South Australia. Light blue indicates less data (fewer sites monitored), pink indicates more data (more sites monitored).

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

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





Table 1: Data on threatened bird taxa included in the SA TBX.

Time-series length (mean \pm SD): 17.3 \pm 9.7

Number of samples (years) per time series (mean \pm SD): 9.9 \pm 5.4

Number of data sources in Index: 7

Number of taxa in Index: 13

Taxon name	Functional group	Functional sub-group	BirdLife Australia status	EPBC status	# data sources	# time series	Mean time-series length
Taxa in index							
Australian Fairy Tern	Marine	Gulls Terns Noddies Skuas Jaegers	Vulnerable	Vulnerable	2	49	8.7
Curlew Sandpiper	Shoreline (migratory)		Critically Endangered	Critically Endangered	9	66	26.5
Far Eastern Curlew	Shoreline (migratory)		Critically Endangered	Critically Endangered	9	35	28.0
Great Knot	Shoreline (migratory)		Endangered	Critically Endangered	9	24	12.6
Greater Sand Plover	Shoreline (migratory)		Vulnerable	Vulnerable	9	13	12.7
Lesser Sand Plover	Shoreline (migratory)		Endangered	Endangered	9	24	30.3
Red Knot	Shoreline (migratory)	Island endemic Mallee woodland	Endangered	Endangered	9	30	11.8
Eastern Regent Parrot	Terrestrial		Endangered	Vulnerable	4	50	12.7
Orange-bellied Parrot	Terrestrial		Critically Endangered	Critically Endangered	2	1	29.0
Kangaroo Island Glossy Black-Cockatoo	Terrestrial		Endangered	Endangered	1	6	18.0
Black-eared Miner	Terrestrial		Endangered	Endangered	2	74	13.9
Malleefowl	Terrestrial		Vulnerable	Vulnerable	4	28	17.0
Australasian Bittern	Wetland		Endangered	Endangered	7	12	12.8

Further Information

For more information or to become a *Friend of the Index* and receive updates on the progress of the project please contact: Dr Elisa Bayraktarov; e.bayraktarov@uq.edu.au

The data underpinning the index was contributed by many different individuals and organisations, including Commonwealth, State and Territory agencies, research institutions, environmental non-government organisations and consultants. Visit this web page for more information: tsx.org.au

Go to the **web-app** to access and explore the data behind the TSX and to produce reports tailored to your particular needs. This project is supported by BirdLife Australia.



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