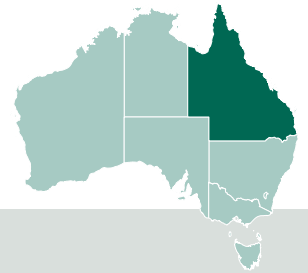


Science for Saving Species

Research findings factsheet

Project 3.1

Factsheet: A Threatened Bird Index for Queensland



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 of 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 at 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 to illustrate how Australia's threatened species are faring. 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 Queensland birds

Here, the national Threatened Bird Index (TBX) is drilled down to display information relating to trends for threatened birds in Queensland (Figure 1A). In its first iteration, this index incorporates data on 14 threatened bird species, subspecies or distinct populations (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 the baseline.

In 2015, the Qld TBX value using data currently available is 0.26. This suggests that the relative abundance of threatened birds for which we have suitable data has decreased by 74% between 1985 and 2015. While the overall index value in 2015 is 0.26, individual species have TBX values between 0.10 (a 90% decrease) and 0.57 (a 43% decrease). In comparison, the national TBX shows a decrease of 52% in the data compiled about threatened birds Australia-wide.

What should we know about the Queensland data?

This index is based on 2,596 time series (defined as sites where data on a species are recorded using the same methodology and a consistent monitoring effort through time) across these 14 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 calculation of the index. No trends are calculated for indices with datasets on less than three species.

The data on which the Qld index is based mostly come from the east coast and far inland, arid habitats of the state, with the areas of central Qld Mulga and Mitchell Grass Downs habitats, and the Gulf of Carpentaria being poorly represented (Figure 1B). The number of sites monitored (Figure 1C) in Qld has substantially increased since 1991, while the number of species monitored increased from three in 1991 to 13 in 2008 (Figure 1D). In combination, this has resulted in a huge increase

in the number of available time series, from 125 in 1991 to 2,262 in 2008.

As more quality-assured data on threatened birds become available, they can be added to make 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 already existing monitoring programs be sustained, and the provision of data to the index is maintained—this will enable us to continue to track changes in threatened species relative abundance. BirdLife Australia has committed stewardship for the TBX component of the TSX.

Interpretational issues and constraints

- For migratory species, for example, shorebirds, decreases in the TBX may be a result of declines that have occurred far away from the locations where they have been monitored (e.g. monitoring in Australia may be detecting the impact of decreases in habitat elsewhere in the flyway).
- The overall index does not include data for all of Queensland'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. Scope exists to make the index more comprehensive by including information about a greater number of threatened bird species. This may even require specially targeted monitoring to be undertaken 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 it may not be possible to compare trends during that period with those from later periods, when many more species were incorporated in the overall index.
- Unsurprisingly, very little appropriate monitoring data were available for some remote regions in Qld (although it is also possible that fewer bird species are listed as threatened in remote regions).

Painted Honeyeater. Photo: Stuart Harris CC BY-SA 2.0 Wikimedia Commons



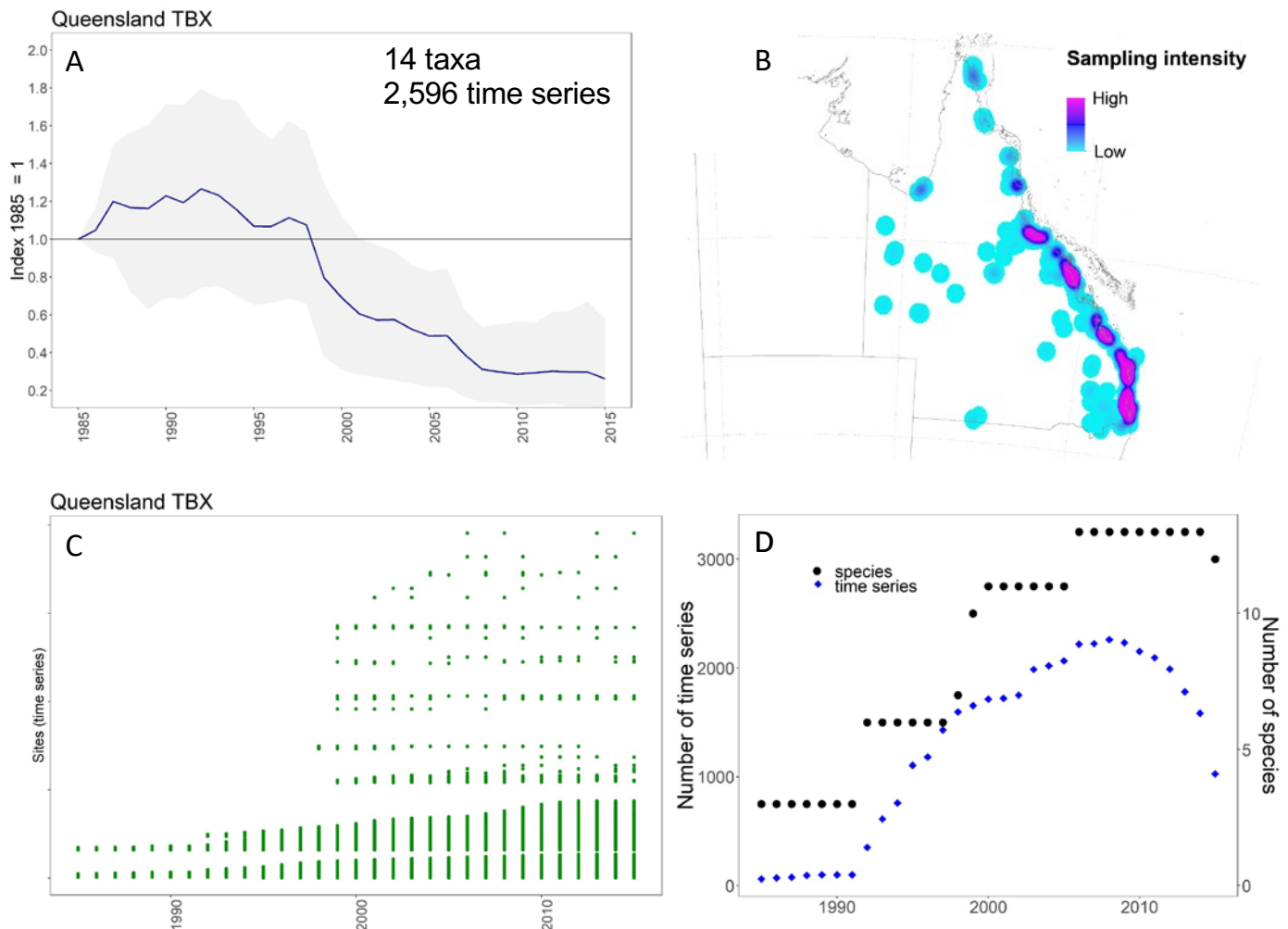


Figure 1 (above):

A) The Threatened Bird Index (TBX) for Queensland. 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 interpreted as the variability of single-species trends that build the composite index.

B) A map showing where threatened bird data were recorded in Queensland. 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, in which a species was monitored with a consistent method at a single site.

D) A graph showing 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 Qld TBX.

Time-series length (mean \pm SD): 15.6 \pm 6.0

Number of samples (years) per time series (mean \pm SD): 10.9 \pm 5.5

Number of data sources in Index: 7

Number of taxa in Index: 14

Taxon name	Functional group	Functional sub-group	BirdLife Australia status	EPBC status	# data sources	# time series	Mean time-series length
Curlew Sandpiper	Shoreline (migratory)		Critically Endangered	Critically Endangered	2	444	16.5
Far Eastern Curlew	Shoreline (migratory)		Critically Endangered	Critically Endangered	2	613	16.1
Great Knot	Shoreline (migratory)		Endangered	Critically Endangered	2	435	15.1
Greater Sand Plover	Shoreline (migratory)		Vulnerable	Vulnerable	2	316	15.3
Lesser Sand Plover	Shoreline (migratory)		Endangered	Endangered	2	412	16.5
Red Knot	Shoreline (migratory)		Endangered	Endangered	2	277	15.7
Capricorn Yellow Chat	Terrestrial		Endangered	Critically Endangered	1	11	7.8
Northern Eastern Bristlebird	Terrestrial		Critically Endangered	Endangered	1	6	7.2
Painted Honeyeater	Terrestrial	Dry sclerophyll woodland/forest	Vulnerable	Vulnerable	1	15	12.8
Southern Squatter Pigeon	Terrestrial	Dry sclerophyll woodland/forest	Least concern	Vulnerable	1	43	10.6
Northern Rufous Scrub-bird	Terrestrial	Rainforest	Endangered	Endangered	1	7	9.4
Gouldian Finch	Terrestrial	Tropical savanna woodland	Near threatened	Endangered	1	3	14.7
Southern Black-throated Finch	Terrestrial	Tropical savanna woodland	Vulnerable	Endangered	1	6	8.7
Australasian Bittern	Wetland		Endangered	Endangered	1	8	11.8

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.

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National Environmental Science Programme

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