

# Science for Saving Species

## Research findings factsheet

### Project 3.1



National Environmental Science Programme

## Factsheet: A Threatened Mammal Index for Victoria



### 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 at national, state and regional levels. Australia's TSX is based on the Living Planet Index ([www.livingplanetindex.org](http://www.livingplanetindex.org)), a method developed by World Wildlife Fund and the Zoological Society of London. The TSX has been designed to be a dynamic tool to which new monitoring data are added and examined annually.

### 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 threatened species, or at least a subset of them. 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 and near-threatened birds and mammals, and monitoring data

for threatened plants are currently being assembled.

These indices will allow Australian governments, non-government organisations, stakeholders and the community to better understand and report on which groups of threatened species are in decline by bringing together monitoring data. 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 investment.



RIGHT: Southern brown bandicoot.  
Image: Steve Duke Photography  
Flickr CC BY NC ND 2





## A Threatened Species Index for mammals in Victoria

Different taxonomic groups can be explored individually in the Threatened Species Index. Here, we present a report from the national Threatened Mammal Index (TMX) on trends for threatened and near-threatened mammals for Victoria (Figure 1A). In its first iteration, this index incorporates data from seven threatened and near-threatened mammal taxa (Near Threatened, Vulnerable, Endangered or Critically Endangered under the EPBC Act and/or IUCN – see Table 1). We used information from the Australian Species Profile and Threats Database and the international IUCN Red List as of July 2019 to make a decision about the currently listed taxa.

For the index on all sites in Victoria where Australian threatened and near-threatened mammals were monitored, the TMX value in 2016 based on the current data is 0.28. This suggests that the relative abundance of threatened and near-threatened mammals for which we have information has decreased by 72% between 1995 and 2016. While the overall index value in 2016 is 0.28, individual taxa have TMX values between 0.18 (an 82% decrease) and 0.45 (a 55% decrease) (Figure 1A). It is expected that more data (and taxa) will be added as they become available each year, allowing the index to grow.

*RIGHT: Mountain pygmy possum  
Flickr CC Aust Alps*

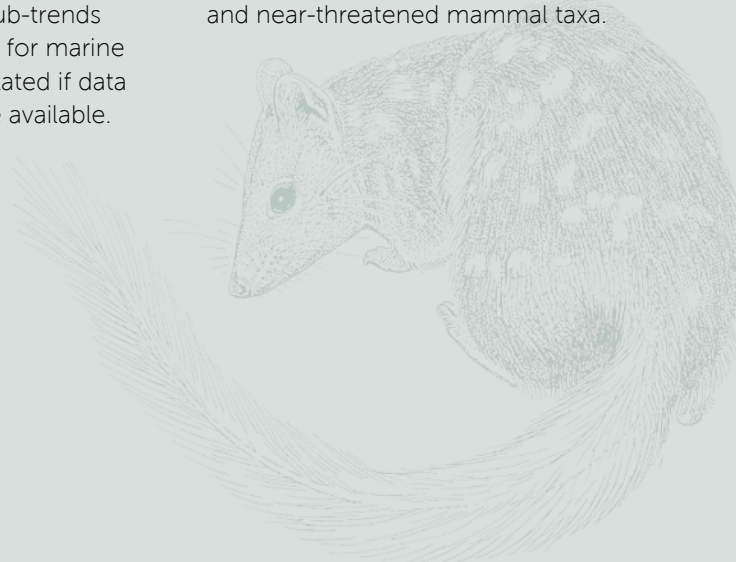


## What should we know about the Victorian data?

This overall index on all monitored sites is based on 362 time series (defined as sites where data on a taxon are recorded using the same methodology and a consistent monitoring effort though time) across these seven taxa. Data quality was maximised by: 1) checking whether each dataset had been produced by standardised monitoring; and 2) by sending surveys on 127 eligible datasets to custodians and requesting them to assess the trends produced for their datasets. Feedback was received for 74% of the datasets.

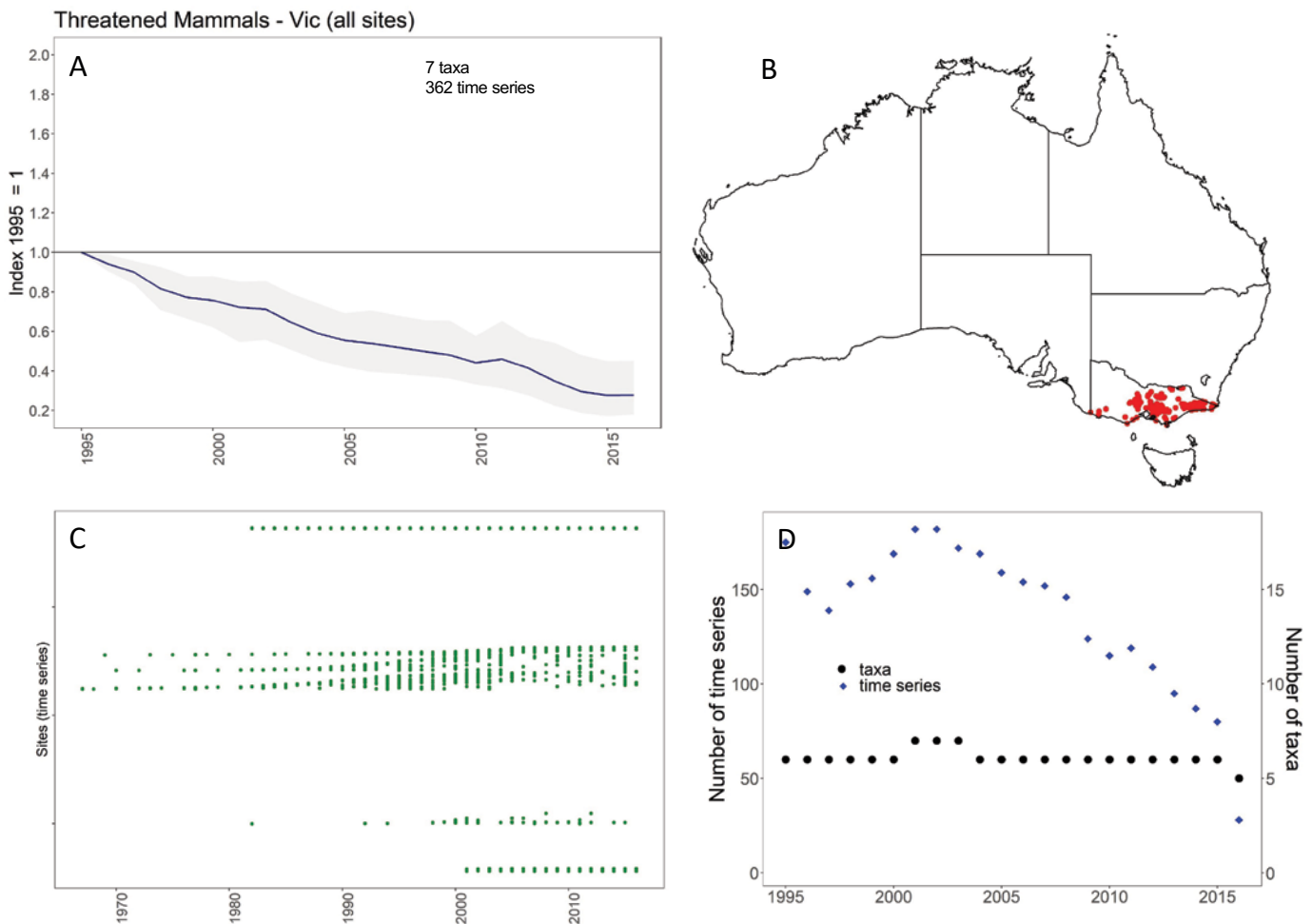
Only time series that had been produced by standardised monitoring and with a minimum length of two years collected between 1995 and 2016 inclusive were used for index calculation. The data contain a large proportion of sites extracted from the State of Victoria's Victorian Biodiversity Atlas, Victoria's primary data repository, but not many datasets from targeted threatened species monitoring programs. Sub-trends of the overall trend (e.g., for marine mammals) can be calculated if data on at least three taxa are available.

As more high-quality data become available they can be added, making the index more powerful, meaningful and representative. Increasing the number of taxa, regions and functional groups monitored would strengthen the value of the index. Ongoing long-term monitoring programs allow for continuing capability to track changes in the relative abundance of threatened and near-threatened mammal taxa.



## Interpretational issues and constraints

- This composite index only includes data for threatened and near-threatened mammal taxa provided by the custodians endeavouring to meet the TMX criteria supplied. Inspection of these data indicate they are biased to the coastal areas of most states and are sparse for the arid zone. The index can be useful for also identifying strategic monitoring opportunities to increase the comprehensiveness of representation of threatened and near-threatened mammal taxa (see Table 1).
- There were limited data from targeted threatened species monitoring programs as well as data for remote areas available for inclusion in the index to 2016.
- Some mammal subgroups, such as bats and rodents, are still underrepresented.
- The proportional representation of threatened and near-threatened mammal taxa, and spatial coverage, is low in comparison to data on threatened and near-threatened birds (Threatened Bird Index).



**Figure 1:** A) The Threatened Mammal Index (TMX) for Victoria, including data from all sites where threatened and near-threatened mammal taxa were provided. The blue line shows the change in mammal abundance relative to the baseline year of 1995, where the index is set to 1.0. The grey cloud shows the range of trends for the individual taxa that make up the overall multi-taxa index. It can be seen as the variability between single-taxa trends that contribute to the composite (i.e., it is not statistical confidence).

B) A map showing where threatened and near-threatened mammal data were recorded in Victoria. The red dots indicate repeatedly monitored fixed sites.

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

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



**Table 1:** Data on threatened and near-threatened mammal taxa included in the TMX for Victoria.

Times-series length (mean  $\pm$  SD): 11.8  $\pm$  8.9

Number of samples (year) per time series (mean  $\pm$  SD): 3.7  $\pm$  3.8

Number of data sources in index: 3

Number of data taxa in index: 7

Taxon common name	Taxon scientific name	Functional Group	IUCN Status	EPBC Status	# data sources	# time series	Mean time-series length
Brush-tailed phascogale	<i>Phascogale tapoatafa</i>	Terrestrial:Arboreal:50-5000g	Near Threatened		1	73	7.8
Eastern barred bandicoot	<i>Perameles gunnii</i>	Terrestrial:50-5000g	Near Threatened		1	4	12.3
Leadbeater's possum	<i>Gymnobelideus leadbeateri</i>	Terrestrial:Arboreal:50-5000g	Critically Endangered	Critically Endangered	1	19	15.8
Mountain pygmy-possum	<i>Burramys parvus</i>	Terrestrial:<50g	Critically Endangered	Endangered	1	2	35.0
Southern brown bandicoot (south-eastern Australia)	<i>Isodon obesulus obesulus</i>	Terrestrial:50-5000g		Endangered	1	12	10.4
Southern greater glider	<i>Petauroides volans</i>	Terrestrial:Volant:50-5000g	Least Concern	Vulnerable	1	137	12.5
Yellow-bellied glider	<i>Petaurus australis</i>	Terrestrial:Volant:50-5000g	Near Threatened		1	115	12.6



Eastern barred bandicoot. Image: JJHarrison CC BY-SA 3.0 Wikimedia Commons

## 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@uq.edu.au](mailto:tsx@uq.edu.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 (e.g., Australian Wildlife Conservancy and Arid Recovery) and consultants. Visit this web page for more information: [tsx.org.au](http://tsx.org.au)

Go to the web-app to access and explore the data behind the TMX and to produce reports tailored to your particular needs.

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