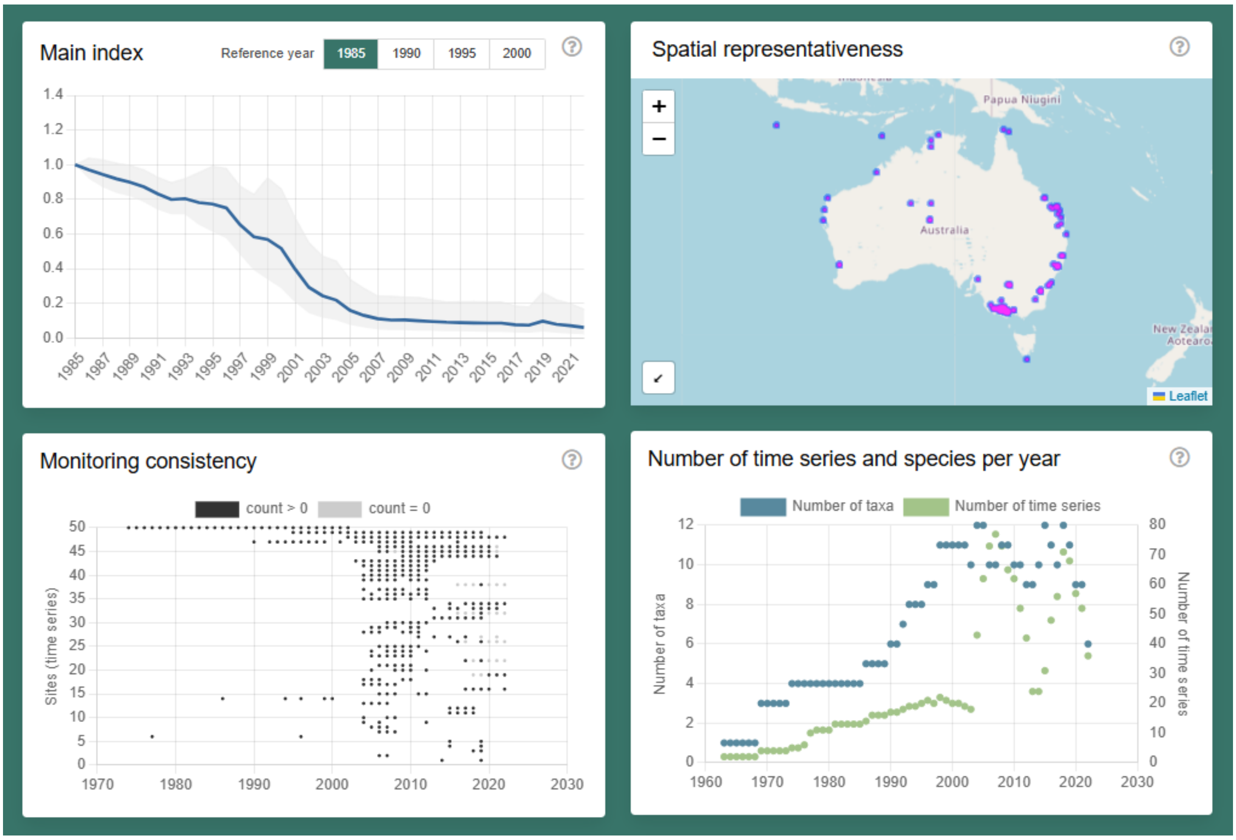
Threatened Reptile Index

A pilot index for Australia's threatened and near-threatened reptiles

Summary of trends up to 2022

Dated: Tuesday, 25 November 2025



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Background

Australia has an extraordinarily rich reptile fauna, with over 1100 taxa (species and sub-species) recognised as of December 2025. Among these, 142 taxa (12%) are listed as threatened or near-threatened by the Australian Government and/or the International Union for the Conservation of Nature (IUCN). 1 species — the Christmas Island Forest Skink (*Emoia nativitatis*) — is listed as extinct.

Australia's reptiles have been the focus of considerable survey, monitoring and management effort. Numerous projects by government and non-government agencies, academics and citizen scientists and community groups have gathered data on species occurrence and abundance. These studies have delivered crucial insights into the status and conservation needs of Australia's reptiles; however, the resulting data have not previously been compiled to assess long-term, multi-species trends.

The Threatened Species Index, operated by the NCRIS-enabled Terrestrial Ecosystem Research Network (TERN), has built a pilot 'Threatened Reptile Index' by aggregating monitoring data from across Australia.

The Threatened Species Index (TSX)

The TSX aims to provide a reliable and robust metric of change in the relative abundance of Australia's threatened and near-threatened species. Understanding changes over time is crucial for evaluating whether Australia is progressing towards its conservation targets.

The TSX is managed by TERN at The University of Queensland and funded by the Australian Government. The index was established by the *Threatened Species Recovery Hub* in collaboration with BirdLife Australia, funded by the Australian Government's National Environmental Science Program.

The TSX brings together thousands of monitoring datasets from across Australia and releases trend updates annually. Trends are calculated using the *Living Planet Index* (LPI) methodology, developed by the World Wildlife Fund and the Zoological Society of London. An explanation of how to interpret the trends can be found in the Appendix. For an explanation of how the LPI methodology is used to generate trends, see **here**.

Assembling all the data is a big task and is being staged. Data and trends for threatened birds, mammals, and plants were released between 2018 and 2020. In 2021 and 2022, new data was collated for these existing groups. In 2023, a comprehensive update to the *Threatened Bird Index* occurred. In 2024, a pilot *Threatened Frog Index* was created. In 2025, a pilot *Threatened Reptile Index* has been created.

What is this document for?

This document provides a summary of the results from the pilot *Threatened Reptile Index*. Below you will find national trends along with a break-down of trends among species groups and jurisdictions. **We are seeking feedback on these trends from data contributors and others with expertise on Australian reptiles.**

Note that a 3-year lag is implemented, because data quality is often poor in the years immediately preceding the release date. **As such, this pilot index includes trends up to 2022**. Only species and sub-species listed as threatened or near-threatened by the Australian Government and/or by the IUCN are included.

Why is this a 'pilot' index?

The 2025 release of the *Threatened Reptile Index* is termed a pilot index as it is the first attempt to build this index and, while the underlying dataset is extensive, important datasets are yet to be included. We will continue to pursue these data in 2026**. As such, the trends presented here should be considered interim**.

Further information and feedback

If you would like to give feedback on the trends provided here, have data you think could contribute or would like further information about the project, please contact the TSX team at **tsx@tern.org.au**.

The Threatened Reptile Index 2025

The dataset

Taxa represented	24
○ *Terrestrial*	13
○ *Freshwater*	6
○ *Marine*	7
EPBC listed taxa represented	24 (of 96)
National priority taxa represented	7 (of 11)
IUCN listed taxa represented (threatened)	16 (of 80)
IUCN listed taxa represented (near-threatened)	0 (of 20)
Total data sources	37
Total number of time series	163

Key findings: national trends

Overall trends

Among the 24 taxa of threatened and near-threatened reptiles covered by the current dataset, relative abundance has **declined by 94% on average from a reference year of 1985** (**Figure 1**). A near linear decline in the trend is apparent from 1985 through to 2005. While there has been some stabilisation after 2005, declines are ongoing, albeit at a slower pace. The shading in **Figure 1** gives an indication of variability between taxa around this overall mean value. While it is clear that some species are declining faster than others, and that there is some temporal oscillation in the trend (i.e., around 2000 and again around 2019), the fact that this confidence interval does not cross 1 after the early 1990s and is not above 0.2 in 2022, gives us strong evidence of a very large overall decline for the species and populations of reptiles for which data has been collated so far. Species included in the dataset are listed below and in the Appendix, as are the relevant data sources.

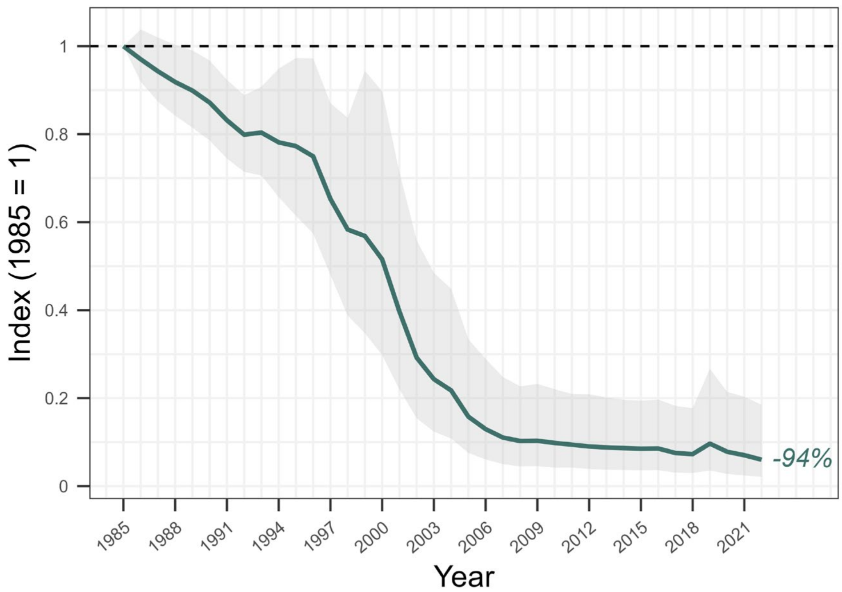

Figure 1. The pilot Threatened Reptile Index 2025, showing trends up to 2022 across all taxa. The green line shows the average change in relative abundance compared to the baseline year of 1985 where the index value is set to 1. The shaded areas show the confidence limits.

Trends across all species for the reference years 1985, 1990, 1995 and 2000 are provided in the **Figure 2**. Significant declines are apparent regardless of reference year, with steepest declines evident from the late 1990s through to around 2005. This period saw significant declines of several marine species, along with declines among some terrestrial species linked to the spread of Cane Toads across the Northern Territory and in one case (the Broad-headed Snake) due to a period of intense poaching. As such, very large declines are still evident using the most recent reference year of 2000. The data suggest relative abundance has fallen on average by 88% between 2002 and 2022.

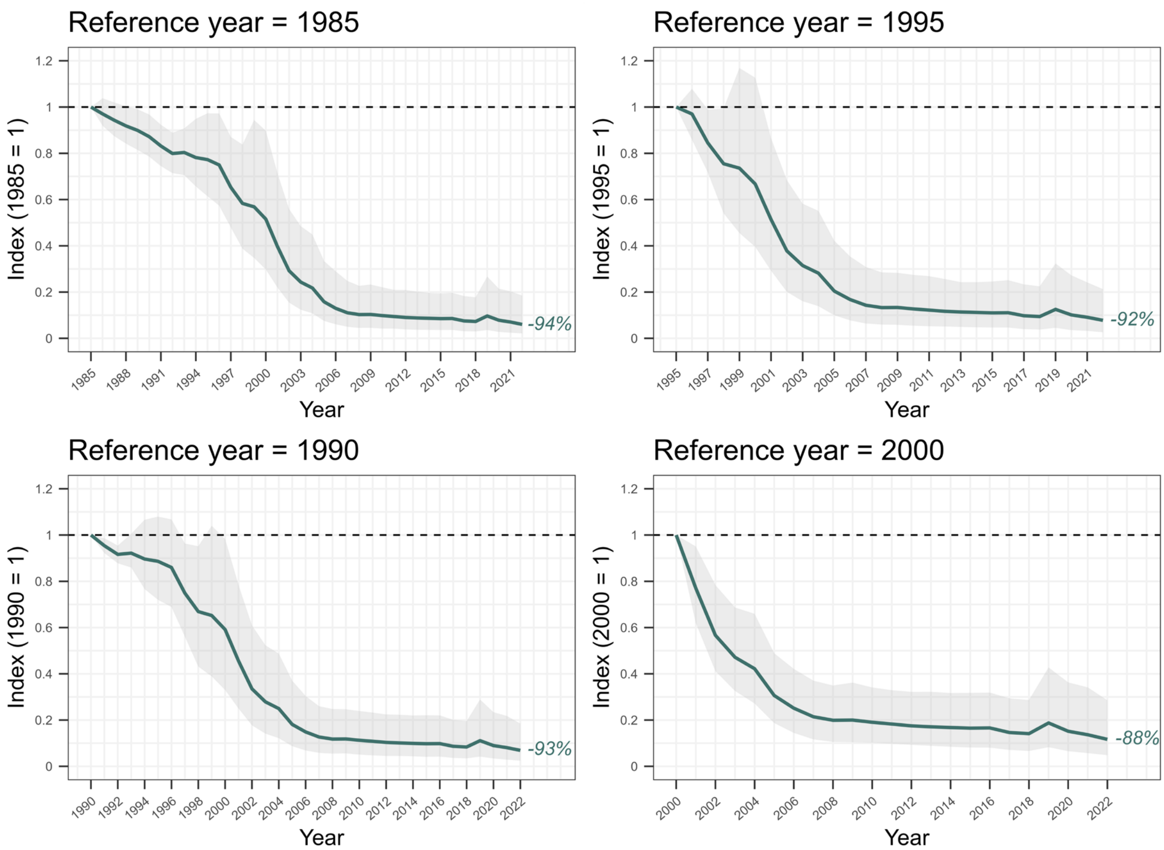

Figure 2. Trend estimates for threatened and near-threatened reptiles through to 2022, with reference years of 1985, 1990, 1995 and 2000. In each case, the green line shows the average change in relative abundance compared to the baseline year. The shaded areas show the confidence limits.

Trends for National Priority Species

The TSX obtained data for 7 of the 11 reptiles listed as national priority species under the Australian Government's Threatened Species Action Plan 2022-2032. These species are the Short-nosed Sea Snake (*Aipysurus apraefrontalis*), the Green Sea Turtle (*Chelonia mydas*), the Great Desert Skink (*Liopholis kintorei*), the Bellinger River Saw-Shelled Turtle (*Myuchelys georgesi*), the Western Swamp Turtle (*Pseudemydura umbrina*), the Pygmy Bluetongue (*Tiliqua adelaidensis*), and the Canberra Grassland Earless Dragon (*Tympanocryptis lineata*). In total, 23 time series of counts were accrued for these species (see Appendix).

The trend for the 7 national priority species is shown in **Figure 3**. **On average, the relative abundance of national priority reptile species declined by 98% since 1995** (the earliest reference year for which a trend can be generated). As with the broader national trend, the overall trend for these species is one of significant decline from 1995 to 2005, with some slowing of the pace of declines since 2006.

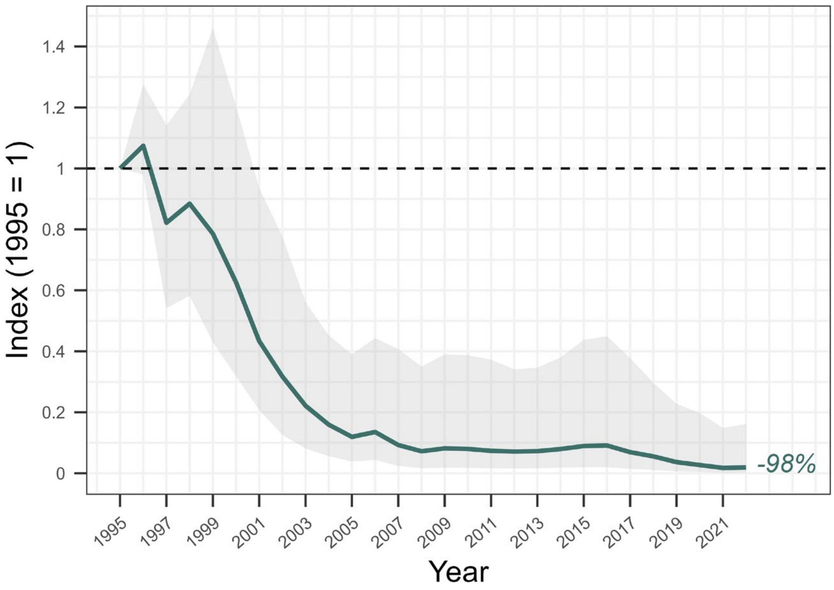

Figure 3. The trend for national priority reptile species between 1995 and 2022. The green line shows the average change in relative abundance compared to the baseline year of 1995 where the index value is set to 1. The shaded areas show the confidence limits.

Comparison of trends among key functional groups

The TSX seeks to build trends for key functional groups to enable greater insights into how abundance trends vary among natural taxonomic, morphological and/or ecological species groups. In the case of reptiles, data gathered thus far cover terrestrial and marine snakes, terrestrial lizards and freshwater and marine turtles. However, the coverage of taxa is currently too low to derive trends beyond broad functional groupings. Below, trends for species based on the biome they inhabit are presented, as: 'terrestrial', 'freshwater' or 'marine' (**Table 2**). However, note that 2 highly aquatic goannas — *Varanus mertensi* and *V. mitchelli* — are listed as being both terrestrial and freshwater taxa.

The number of taxa in each group are low and the confidence limits around the estimates presented in **Table 2** are wide (plots are provided in the Appendix), in which case the comparison should be treated with some caution. However, there is a clear difference between species from the terrestrial and freshwater realms from those in the marine realm. Large declines are evident for terrestrial and freshwater taxa since 2005 (>70%), whereas marine taxa (which are dominated by marine turtles) have been relatively stable overall over this time-period.

Table 2. Estimated change in the relative abundance of reptile species in 3 functional groups since 2005. The end year is 2022 for terrestrial taxa, 2019 for freshwater taxa and 2021 for marine taxa. Inconsistent end years are dictated by data availability.

Functional group	Percent change since 2005	Number of taxa	Number of time series
Terrestrial	-71.7%	13	125
Freshwater	-76.5%	6	17
Marine	+7.1%	7	24

Comparison of trends among States and Territories

For this pilot index, data are currently only sufficient to build trends for 2 jurisdictions: Queensland and Western Australia. **Table 3** and **Figure 4** provide comparisons for the 3 reference years for which trends could be produced (1990, 1995 and 2000). **Nevertheless, we advise caution with these trends, as data are quite patchy taxonomically, spatially and temporally.**

Data for **Queensland** are dominated by turtles (5/6 taxa), and particularly marine turtles (4/6 taxa). The single freshwater turtle is the critically endangered Mary River Turtle (*Elusor macrurus*), and the 1 terrestrial species is the critically endangered Nangur Spiny Skink (*Nangura spinosa*). Marine turtles are the Green Sea Turtle (*Chelonia mydas*), Loggerhead Turtle (*Caretta caretta*), Flatback Turtle (*Natator depressus*) and Hawksbill Sea Turtle (*Eretmochelys imbricata*). Slow declines are evident when these 6 taxa are combined, ranging from a 43% decline with a reference year of 1990 to a 32% decline with a reference year of 2000.

Data for **Western Australia** are similarly skewed to turtles, including the freshwater Western Swamp Tortoise (*Pseudemydura umbrina*) and 3 marine turtles: Green Sea Turtle, Flatback Turtle and Loggerhead Turtle. Other marine species are sea snakes (3 species from the genus *Aipysurus*), with data from only a single terrestrial species, the Great Desert Skink (*Liopholis kintorei*). The scant data for these taxa suggest significant overall declines (up to 75% with a reference year of 1995); however, these declines are heavily influenced by changes in sea snake abundance at Ashmore Reef during the late 1990s and early 2000s. **While we have provided these trends, we reiterate that they should not be interpreted as representative at this stage, given significant data limitations.**

Table 3. Comparison of trends for threatened and near-threatened reptiles in 2 jurisdictions for which data are sufficient to build trends: Queensland and Western Australia. Percent change is provided for 3 reference years: 1990, 1995 and 2000. Given the data limitations, we urge considerable caution with these trends.

Jurisdiction	Percent change since 1990	Percent change since 1995	Percent change since 2000
Queensland	-42.6%	-36.6%	-32.1%
Western Australia	-71.6%	-75.3%	-41.2%

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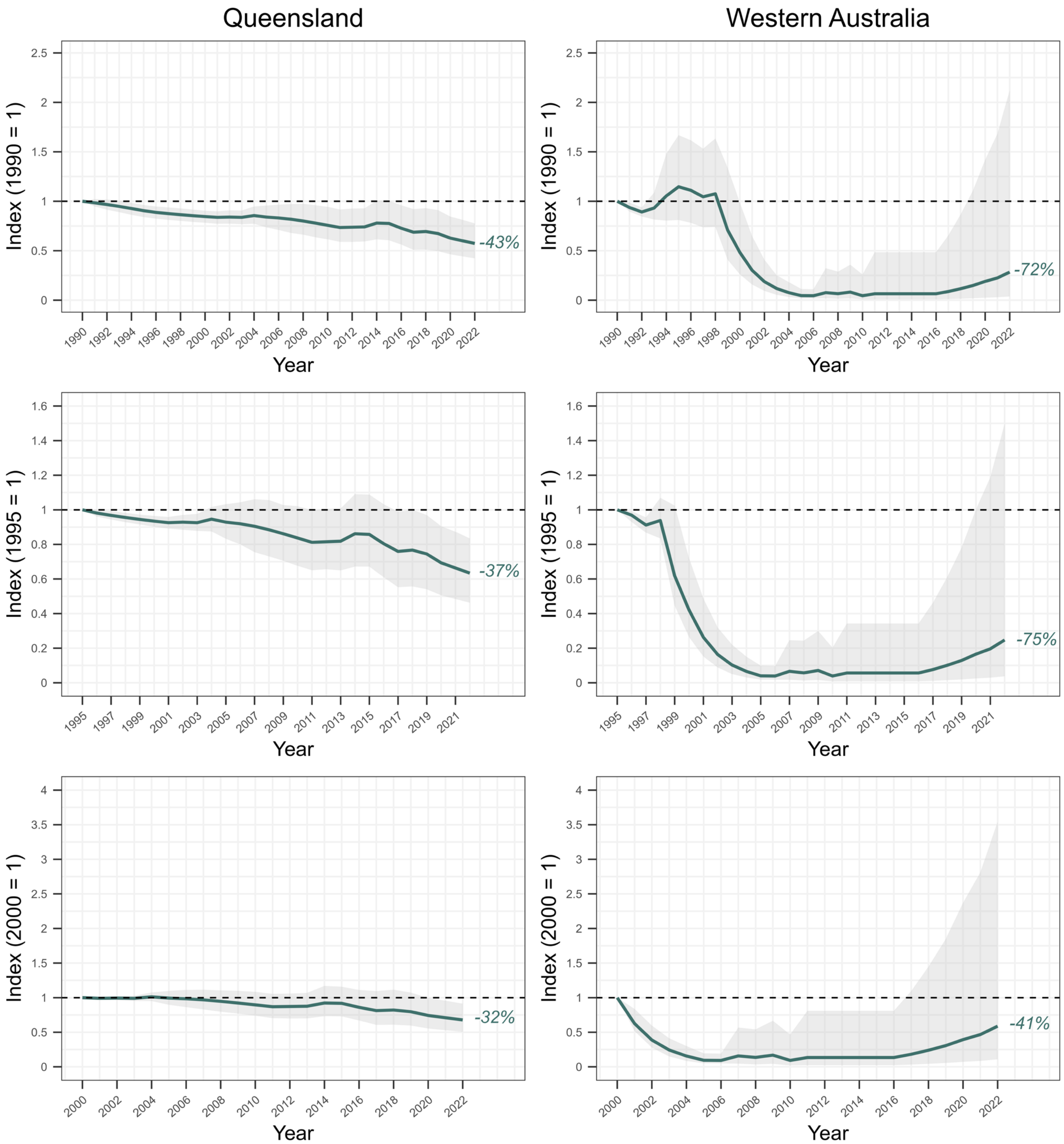

Figure 4. Trends for Queensland and Western Australia with 3 reference years: 1990, 1995 and 2000. The green lines show the average change in relative abundance compared to the baseline year where the index value is set to 1. The shaded areas show the confidence limits. Given data limitations, we urge considerable caution with these trends.

What we should know about the data

The multi-species trends provided above are based on the first attempt to compile monitoring data for Australia's threatened and near-threatened reptiles. Data quality was maximised by 1) confirming that each dataset had been produced by standardised monitoring; 2) integrating published trends where possible; 3) by assessing the trends in collaboration with data custodians where possible. Nevertheless, it is important to consider the taxonomic, spatial and temporal biases when interpreting the trends, and the uncertainty around the trends. **They should be considered interim estimates** of change in the abundance of Australia's threatened and near-threatened reptiles, to be refined in 2026 as further monitoring data are compiled.

National dataset

The national trends are based on 163 time series obtained for 24 taxa (**Figures 5 & 6**). Data are primarily from eastern Australia, although important long-term datasets were collated from Western Australia and the Northern Territory. Tasmania is represented by a single time series for a single taxon: the extraordinary Pedra Branca Skink (*Carinascincus palfreymani*) from the rocky island of Pedra Branca, some 30 km off the southern coast of Tasmania. South Australia is represented by 2 time series for the Pygmy Bluetongue (*Tiliqua adelaidensis*), an endangered skink that was thought extinct until its rediscovery in the 1990s. Further details are provided below in the State and Territory summaries, with a full species list provided in the Appendix.

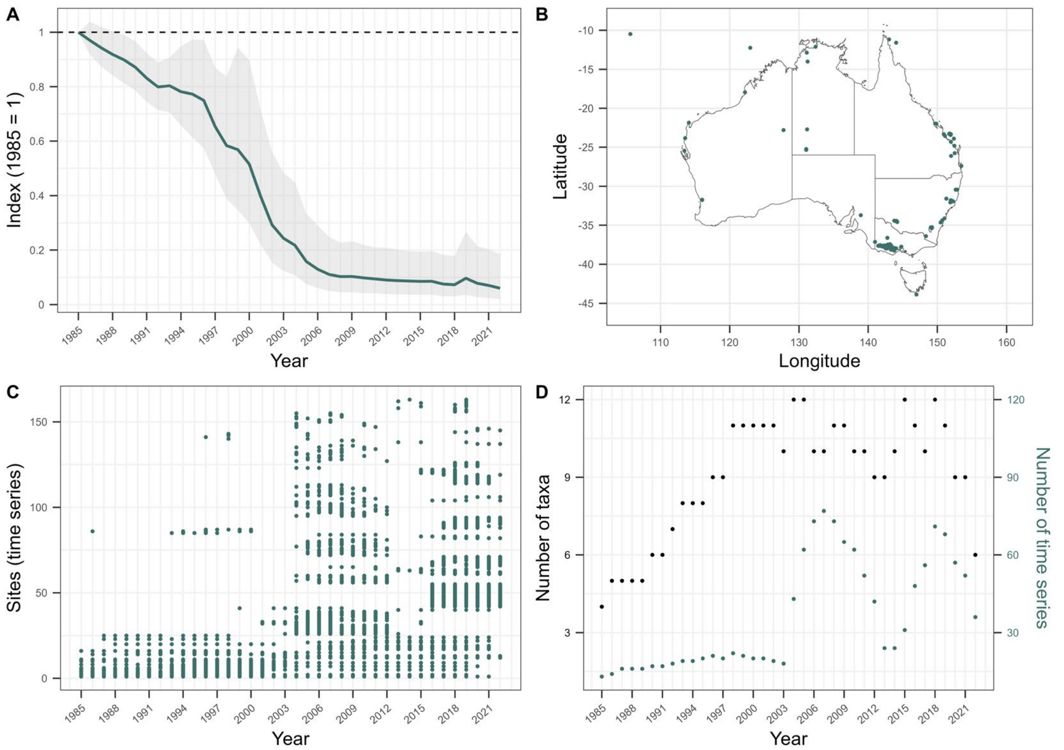

Figure 5. A) The 2025 Threatened Reptile Index for Australia based on all data compiled on threatened and near-threatened reptile taxa. The green line shows the average change in relative abundance compared to the baseline year of 1985 where the index value is set to 1. The shaded areas show the confidence limits. **B)** A map showing where the threatened reptile data were recorded in Australia. The green dots indicate repeatedly monitored sites. **C)** A dot plot showing the 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 in Australia. **D)** The number of taxa (in black circles) and number of time series (in green circles) used to calculate the index for each year.

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The temporal accumulation of data must be considered when interpreting the national trends. In 1985 (the reference year), data were available for only 4 taxa (17% of total) from 13 time series (8% of total) (**Figure 5D**). The number of time series included in the calculation of the index grew rapidly during the 1990s (**Figure 5D**), although the number of taxa accumulates much more slowing and oscillates widely from 2003 onwards. Data availability, both in terms of time series and species coverage, is quite variable for more recent years (**Figure 5D**).

An important additional factor that must be considered when interpreting the national trend is that all data acquired prior to 1990 (except 1 survey for the Pedra Branca Skink) were derived from turtles, of which 3/4 were marine species (**Figure 6**). As such, the initial trend using reference years of 1985 and 1990 are based almost exclusively on marine turtles. Similarly, several species that enter the index have only single time series and/or were collected over short time periods. Examples include the Christmas Island Snake-eye Skink (*Cryptoblepharus egeriae*), Pink-tailed Worm-lizard (*Aprasia parapulchella*), Grey Snake (*Hemiaspis damelii*) and 2 turtles in the genus *Myuchelys* (**Figure 6**). Hence, the data collated for these species has limited spatial and temporal coverage, and where data have been collated from only a subset of all populations, the overall trends may not fully reflect species-wide changes over time.

With regard to the large overall declines for the national trends, it is worth considering that the data collated for this pilot index stem largely from published sources, which may have negatively biased the trends to some currently unknown degree. For example, time series are available for sea snakes in the genus *Aipysurus*, which were reported due to the fact that significant declines were noted. Likewise, data for the 2 goanna species included in the index stem from studies demonstrating their decline as Cane Toads (*Rhinella marina*) invaded the Northern Territory. While 1 of these species remains at very low abundance (*Varanus mitchelli*), the other (*V. mertensi*) has made recent recoveries, but we were unable to include data demonstrating this.

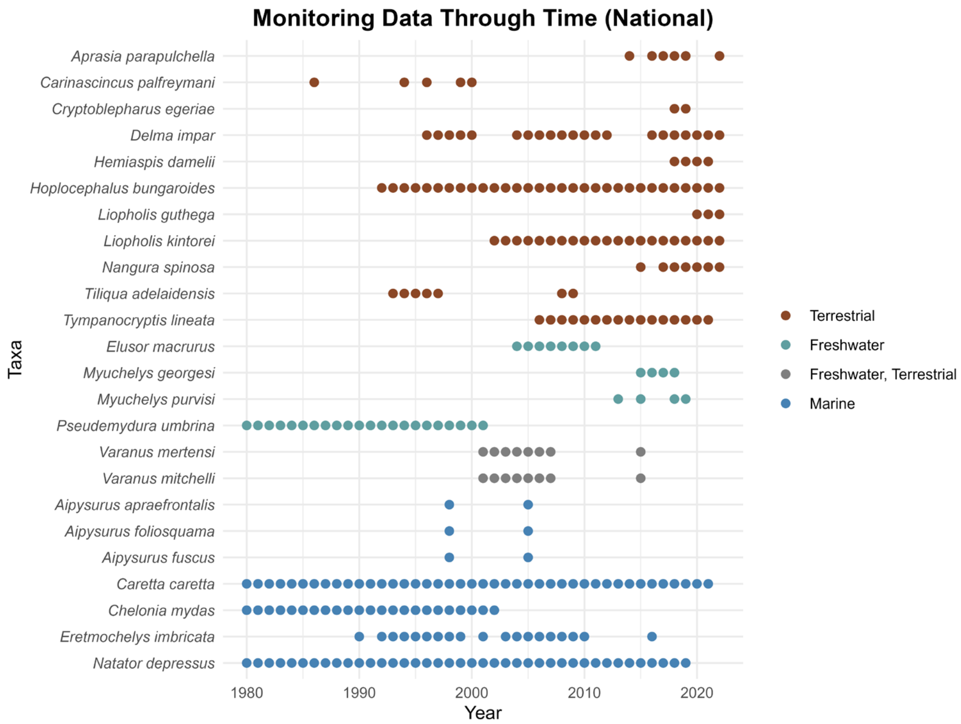

Figure 6. The temporal coverage of monitoring data acquired for threatened and near-threatened reptiles across Australia. Note the significantly greater amount and temporal coverage of monitoring data for marine turtles, and the fact that monitoring data prior to 1990 derive almost exclusively from turtles.

Data for Queensland

Monitoring data was acquired for 6 threatened and near-threatened reptiles in Queensland, totalling 17 time series (**Figure 7**). All data are from the eastern coast and ranges, and islands of the Great Barrier Reef (**Figure 7B**). Long-term monitoring data were available for 4 marine turtles, along with a nesting dataset for the Mary River Turtle (*Elusor macrurus*) and burrow count monitoring for Nangur Spiny Skink (*Nangura spinosa*) (**Figure 8**).

Qld Reptile Index - Quick Facts

Reference year	1990
2022 index value	0.574
% change from 1990	***-42.6%***
Time series	17
Taxa	6
Av. time-series length	25.5
Data sources	8

Beach surveys for nesting marine turtles are some of the longest running monitoring programs for Australian vertebrates. Data were obtained for: the Green Sea Turtle (*Chelonia mydas*), 1974–2004; Loggerhead Turtle (*Caretta caretta*), 1969–2003; Flatback Turtle (*Natator depressus*), 1969–2019; Hawksbill Sea Turtle (*Eretmochelys imbricata*), 1990–2016. These monitoring programs cover many thousands of individual surveys and represent a significant effort from scientists, citizen scientists and the general community.

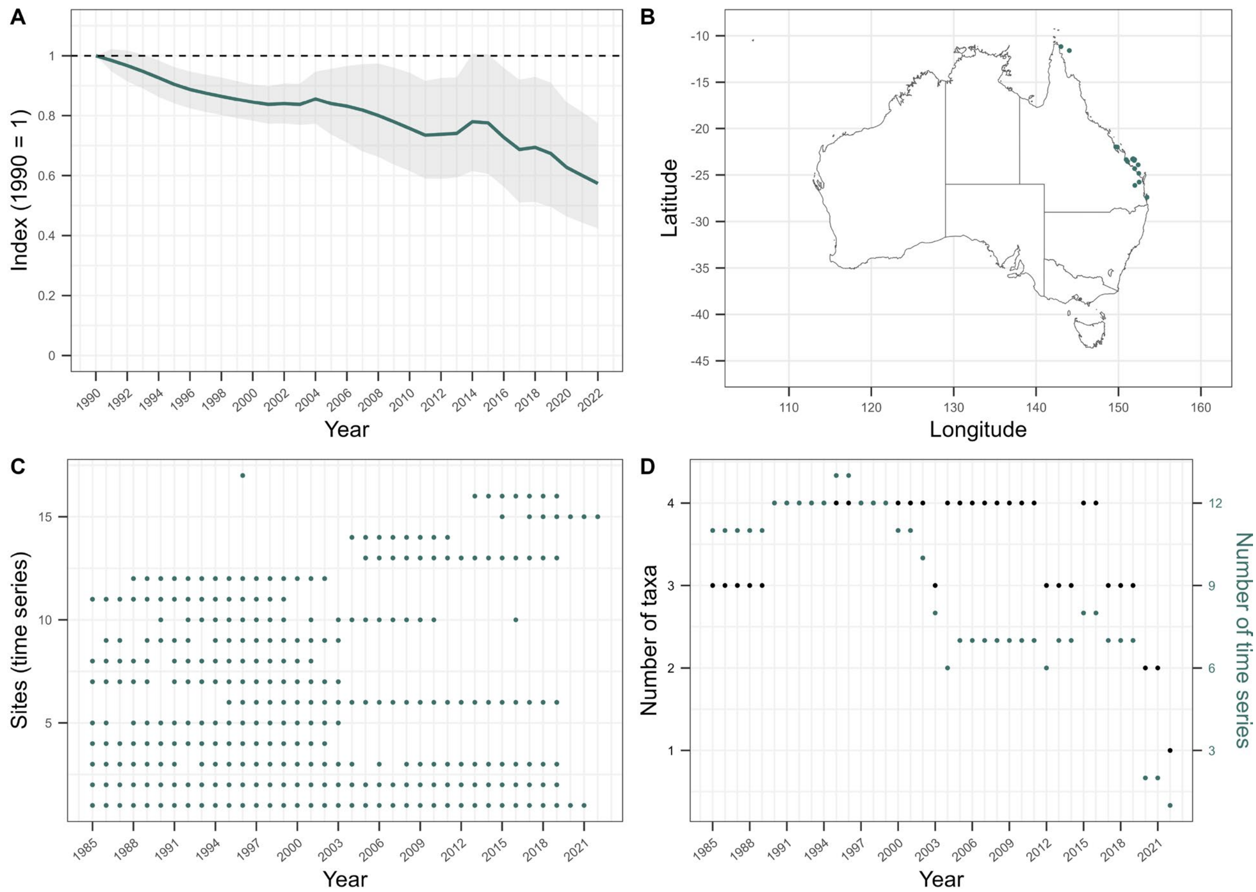

Figure 7. A) The trend for Queensland based on all data compiled on threatened and near-threatened reptile taxa. The green line shows the average change in relative abundance compared to the baseline year of 1990 where the index value is set to 1. The shaded areas show the confidence limits. **B)** A map showing where the threatened reptile data were recorded in Queensland. The green dots indicate repeatedly monitored sites. **C)** A dot plot showing the 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 green circles) used to calculate the index for each year.

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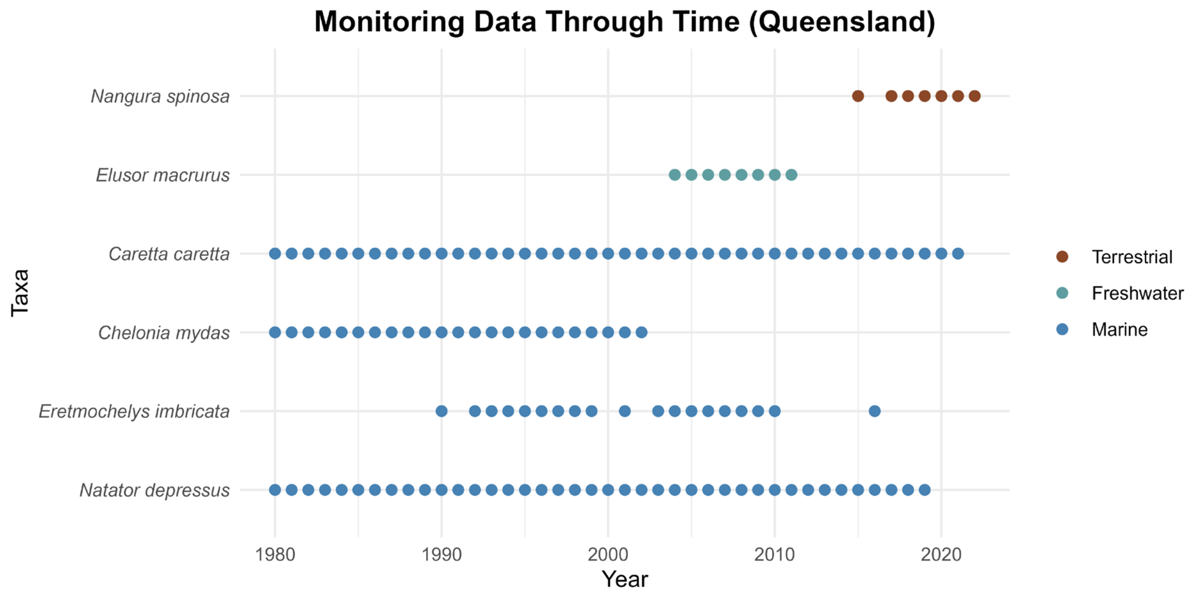

Figure 8. The temporal coverage of monitoring data acquired for threatened and near-threatened reptiles in Queensland.

Data for Western Australia

WA Reptile Index - Quick Facts	
Reference year	1990
2022 index value	0.284
% change from 1990	***-71.6%***
Time series	11
Taxa	8
Av. time-series length	13.9
Data sources	8

Monitoring in Western Australia totalled 11 time series for 8 taxa (**Figure 9**). All but two datasets were for marine species, including marine turtles and several sea snakes (*Aipysurus* spp.). While the latter are from Ashmore Reef, they have been grouped with WA for this index. Freshwater and terrestrial species were represented by the Western Swamp Tortoise (*Pseudemydura umbrina*) and Great Desert Skink (*Liopholis kintorei*) (**Figure 10**).

The critically endangered Western Swamp Tortoise has been monitored since the 1960s, with data in this index extending up to 2001. Extensive monitoring data for the Loggerhead Turtle (*Caretta caretta*) were obtained from 3 data sources (1978–2011), along with data for the Flatback Turtle (*Natator depressus*) and Green Sea Turtle (*Chelonia mydas*). In addition, a 7-year time series was obtained from burrow monitoring in the Western Deserts, as part of a significant Indigenous Ranger program. In addition, a 7-year time series for Great Desert Skink (*Liopholis kintorei*) was obtained from burrow monitoring in the Western Deserts.

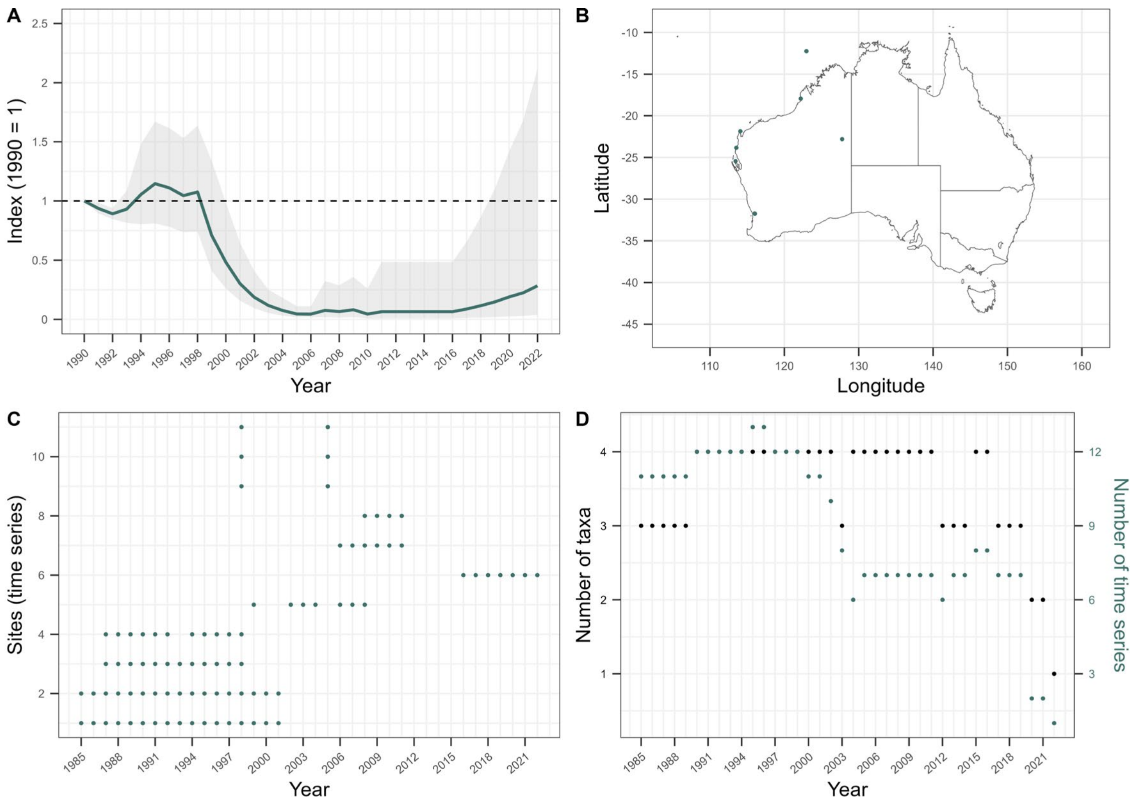

Figure 9. A) The trend for Western Australia based on all data compiled on threatened and near-threatened reptile taxa. The green line shows the average change in relative abundance compared to the baseline year of 1990 where the index value is set to 1. The shaded areas show the confidence limits. **B)** A map showing where the threatened reptile data were recorded in Western Australia. The green dots indicate repeatedly monitored sites. **C)** A dot plot showing the 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 green circles) used to calculate the index for each year.

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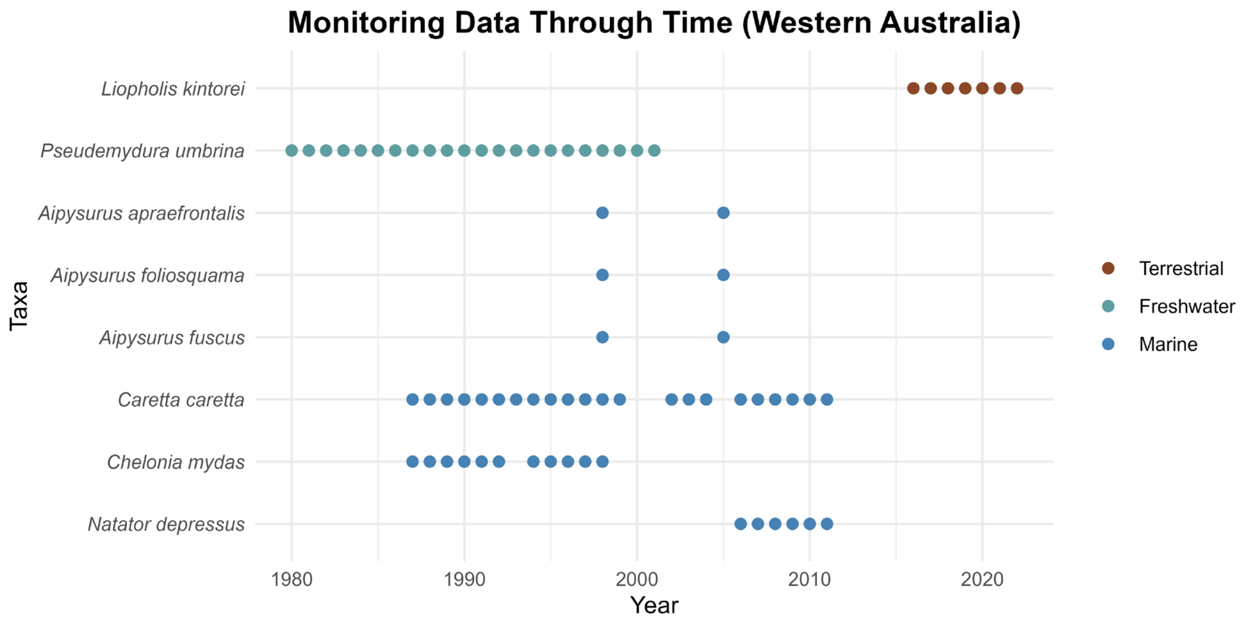

Figure 10. The temporal coverage of monitoring data acquired for threatened and near-threatened reptiles in Western Australia.

Data for other States and Territories

Significant datasets were obtained for threatened and near-threatened reptiles in the Northern Territory, South Australia, Victoria, New South Wales and the Australian Capital Territory (**Figure 13**); however, these data were insufficient — both in terms of number of time series and taxonomic coverage — to generate multi-species trends for these jurisdictions. Improving coverage in these jurisdictions will be a key aim in 2026.

In the Northern Territory, data were acquired for only 4 taxa: 2 goannas (*Varanus mertensi* and *V. mitchelli*) that declined sharply due to the spread of introduced Cane Toads; the Great Desert Skink (*Liopholis kintorei*), which has been the focus of Indigenous Ranger programs in spinifex country in southern NT, and the Flatback Turtle (*Natator depressus*), for which nest monitoring has been conducted at Kakadu for many years.

In South Australia, only 2 short time series for the Pygmy Bluetongue (*Tiliqua adelaidensis*) were obtained. In Victoria, data were likewise restricted to a single taxon: the vulnerable Striped Legless Lizard (*Delma impar*) from the western grasslands. However, this species has been the focus of considerable research and management, with 79 time series obtained from 3 data sources.

In combination, data were available for 8 taxa for New South Wales and the Australian Capital Territory. In the ACT, all taxa were threatened grassland species, being the critically endangered Canberra Earless Dragon (*Tympanocryptis lineata*; 8 time series), the Striped Legless Lizard (*Delma impar*; 15 time series) and the vulnerable Pink-tailed Worm-lizard (*Aprasia parapulchella*; 2 time series). A single population of the Canberra Earless Dragon was also represented in the data for New South Wales. Other datasets from New South Wales included 2 threatened snakes (the Broad-headed Snake, *Hoplocephalus bungaroides* [3 time series] and the Grey Snake, *Hemiaspis damelli* [4 time series]), 1 lizard (the Guthega Skink, *Liopholis guthega* [1 time series]) and 2 highly threatened freshwater turtles (Bellinger River Saw-shelled Turtle, *Myuchelys georgesi* [3 time series] and Manning River Saw-shelled Turtle, *Myuchelys purvisi* [8 time series]).

Finally, a single time series for a single species is included from Christmas Island: the Christmas Island Snake-eyed Skink (*Cryptoblepharus egeriae*). This time series is very short (2 years) and stems from monitoring of a release of captive animals into a predator-free enclosure. While experimental, this is equivalent to datasets for mammals in predator-free enclosures (which the TSX includes) and has been integrated for this reason.

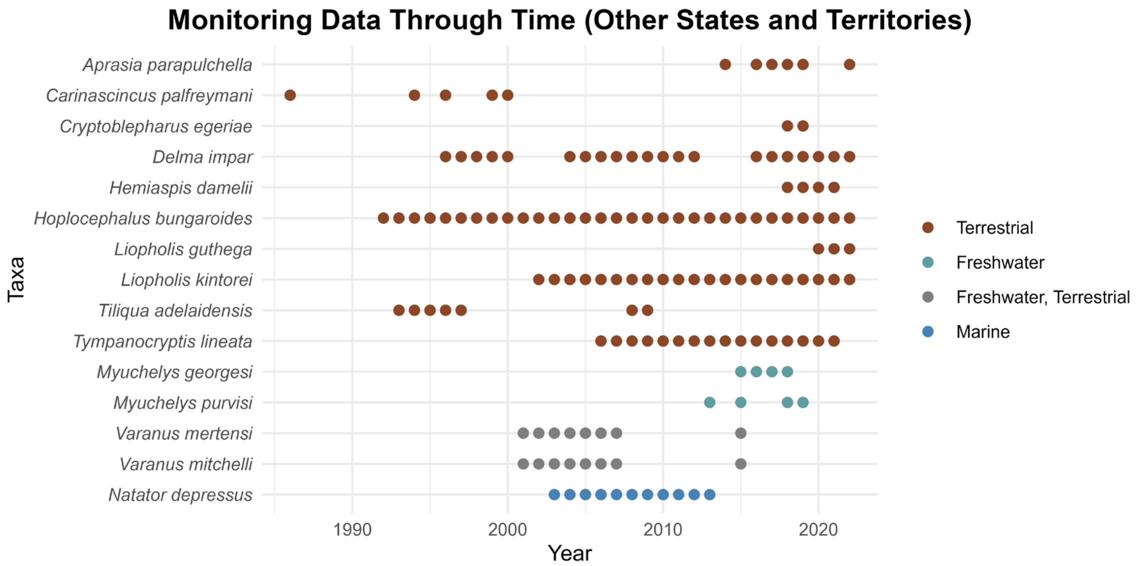

Figure 13. The temporal coverage of monitoring data for threatened and near-threatened reptiles in South Australia, Tasmania, Victoria, New South Wales, the Australian Capital Territory and the Northern Territory.

Glossary

The TSX is created using on multiple time series of population abundance, brought together to reveal changes in threatened species abundance over time. To interpret the results of the TSX correctly, refer to the following definitions of some commonly used terms.

Taxon: a taxonomic unit, specifically including both species and subspecies in this context.

Taxa: plural of *taxon*.

Time series: repeated surveys of a single taxon, conducted at a single site using the same method over at least 2 years.

Population: a group of organisms from the same taxon, living in a distinct area of habitat at a particular time. A single taxon can have multiple populations, depending on its range and habitat distribution.

Abundance: the number of individuals recorded at a survey site. This count provides an estimate of a species' local population size.

Relative abundance: the rate of change in population abundance over time. Rather than measuring the absolute number of individuals, this focuses on how populations increase or decrease relative to their starting abundance.

Confidence limits: ranges that show the level of uncertainty in an index calculation. These are produced using a statistical method called "bootstrapping," which resamples trends to estimate upper and lower bounds. Wider limits indicate greater variation in the underlying trends.

Appendix

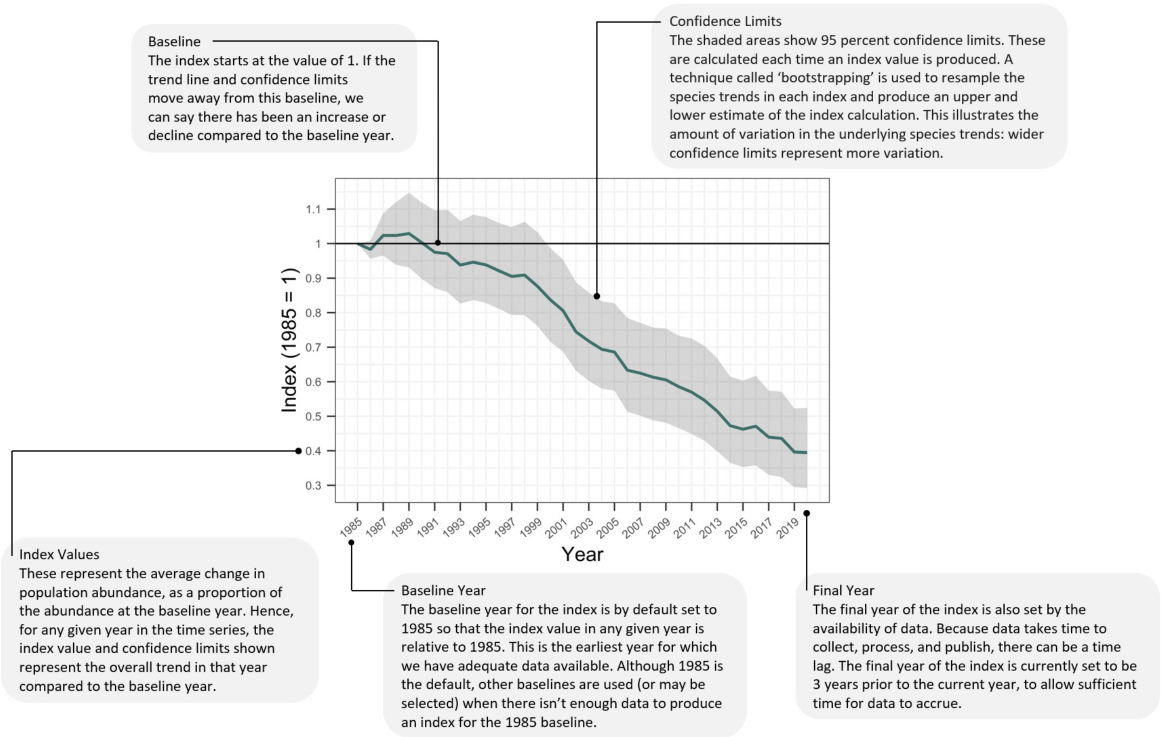

Figure A1. This illustration explains how to interpret the Threatened Reptile Index trend graphs. It briefly explains the time period displayed and what the confidence limits and index values show.

Table A1. Reptile taxa currently included in the pilot Threatened Reptile Index. National Priority Species are bolded.

Taxon name	Taxon scientific name	Functional group	IUCN status	EPBC status	# data sources	# time series	Av. time-series length
Bellinger River Saw-Shelled Turtle	***Myuchelys georgesi***	**Freshwater**	**Data Deficient**	**Critically Endangered**	**1**	**3**	**4**
Broad-headed Snake	*Hoplocephalus bungaroides*	Terrestrial	Vulnerable	Endangered	2	3	13.7
Canberra Grassland Earless Dragon	***Tympanocryptis lineata***	**Terrestrial**	**Least Concern**	**Critically Endangered**	**2**	**8**	**13.4**
Christmas Island Snake-eye Skink	*Cryptoblepharus egeriae*	Terrestrial	Extinct in the Wild	Critically Endangered	1	1	2
Dusky Sea Snake	*Aipysurus fuscus*	Marine	Endangered	Endangered	1	1	8
Flatback Turtle	*Natator depressus*	Marine	Data Deficient	Vulnerable	4	8	21.6
Great Desert Skink	***Liopholis kintorei***	**Terrestrial**	**Vulnerable**	**Vulnerable**	**1**	**4**	**13.8**
Green Sea Turtle	***Chelonia mydas***	**Marine**	**Endangered**	**Vulnerable**	**2**	**3**	**22.3**
Grey Snake	*Hemiaspis damelii*	Terrestrial	Endangered	Endangered	1	5	4
Guthega Skink	*Liopholis guthega*	Terrestrial	Endangered	Endangered	1	1	3
Hawksbill Sea Turtle	*Eretmochelys imbricata*	Marine	Critically Endangered	Vulnerable	1	1	27
Leaf-scaled Sea Snake	*Aipysurus foliosquama*	Marine	Data Deficient	Critically Endangered	1	1	8
Loggerhead Sea Turtle	*Caretta caretta*	Marine	Vulnerable	Endangered	5	9	22.8
Manning River Saw-Shelled Turtle	*Myuchelys purvisi*	Freshwater	Data Deficient	Endangered	1	8	4.5
Mary River Turtle	*Elusor macrurus*	Freshwater	Endangered	Critically Endangered	1	1	8
Mertens's Water Goanna	*Varanus mertensi*	Freshwater, Terrestrial	Endangered	Endangered	2	2	9
Mitchell's Water Goanna	*Varanus mitchelli*	Freshwater, Terrestrial	Critically Endangered	Critically Endangered	1	1	15
Nangur Spiny Skink	*Nangura spinosa*	Terrestrial	Endangered	Critically Endangered	1	1	8
Pedra Branca Skink	*Carinascincus palfreymani*	Terrestrial	Vulnerable	Critically Endangered	1	1	15
Pink-tailed Worm-lizard	*Aprasia parapulchella*	Terrestrial	Least Concern	Vulnerable	2	2	6.5
Pygmy Bluetongue	***Tiliqua adelaidensis***	**Terrestrial**	**Endangered**	**Endangered**	**2**	**2**	**3.5**
Short-nosed Sea Snake	***Aipysurus apraefrontalis***	**Marine**	**Data Deficient**	**Critically Endangered**	**1**	**1**	**8**
Striped Legless Lizard	*Delma impar*	Terrestrial	Endangered	Vulnerable	4	94	6.1
Western Swamp Turtle	***Pseudemydura umbrina***	**Freshwater**	**Critically Endangered**	**Critically Endangered**	**1**	**2**	**39**

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Table A3. Reptile taxa currently included in the pilot Threatened Reptile Index as listed according to EPBC Act (Critically Endangered, Endangered, Vulnerable) and the IUCN Red List (Critically Endangered, Endangered, Vulnerable, Near Threatened). The proportion of all eligible listed taxa represented in the index is also provided.

	EPBC Act	IUCN Red List	All listings
Total number of taxa	24	16	24
Proportion of all listed taxa represented	25%	16%	17%

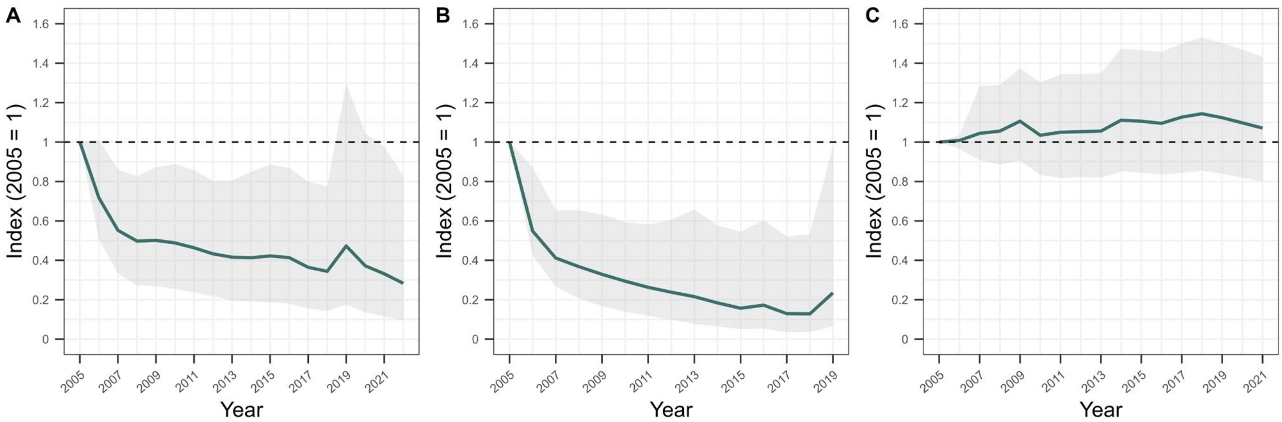

Figure A2. Comparison of trends for terrestrial (**A**), freshwater (**B**) and marine (**C**) reptiles with 2005 as a reference year (the first year for which a trend could be generated for all 3 functional groups). The end year is 2022 for terrestrial species, 2019 for freshwater species, and 2021 for marine species, reflecting differences in data availability. The green line shows the average change in relative abundance compared to the baseline year where the index value is set to 1. The shaded areas show the confidence limits.

Citations for the 37 data sources contributing to the pilot Threatened Reptile Index:

1. Anthony D Griffiths, J. Lindley McKay (2025). Short-term monitoring of Merten's Water Monitor and impacts of Cane Toads. Griffiths, A.D., McKay, J.L. (2007). Cane toads reduce the abundance and site occupancy of Merten's water monitor (*Varanus mertensi*). Wildlife Research 34, 609-615. Northern Territory Government. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
2. Bell, I.P., Meager, J.J., Eguchi, T., Dobbs, K.A., Miller, J.D., Madden Hoff, C.A. (2025). Long-term monitoring Hawksbill Turtle nesting in Queensland. Bell, I.P., Meager, J.J., Eguchi, T., Dobbs, K.A., Miller, J.D., Madden Hoff, C.A. (2020) Twenty-eight years of decline: Nesting population demographics and trajectory of the north-east Queensland endangered hawksbill turtle (*Eretmochelys imbricata*), Biological Conservation, 241, p. 108376. Queensland Department of Environment, Tourism, Science and Innovation. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
3. Bruce C. Chessman, Gerry McGilvray, Shane Ruming, Hugh A. Jones, Kristen Petrov, Darren P. Fielder, Ricky-John Spencer, Arthur Georges (2025). Monitoring of Bellinger River Snapping Turtle. Chessman et al. (2020). On a razor's edge: Status and prospects of the critically endangered Bellinger River snapping turtle, *Myuchelys georgesi*. Aquatic Conservation: Marine and Freshwater Ecosystems 30, 586-600. The State of New South Wales. Aggregated for the Australian Threatened Species Index, an

output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

4. Burbidge, A.A, Kuchling, G. (2025). Long-term monitoring of Western Swamp Tortoise in Western Australia. Burbridge, A. and Kuchling, G. (2004). Western Swamp Tortoise (*Pseudemydura umbrina*) Recovery Plan. Western Australian Department of Conservation and Land Management. State of Western Australia. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
5. City and Environment Directorate, ACT Government (2025). Long-term monitoring of the Canberra Earless Dragon. Compiled from: DCCEEW (2022). Consultation on Species Listing Eligibility and Conservation Actions. *Tympanocryptis lineata* (Canberra grassland earless dragon). DCCEEW, Canberra. City and Environment Directorate, ACT Government. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
6. City and Environment Directorate, ACT Government (2025). Long-term monitoring of the Pink-tailed Worm-lizard in the ACT by the Pink-tailed Worm-lizard Fauna Team. Compiled by Richard Milner. City and Environment Directorate, ACT Government. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
7. City and Environment Directorate, ACT Government (2025). Long-term monitoring of the Striped Legless Lizard by the Striped Legless Lizard Offsets Team. City and Environment Directorate, ACT Government. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
8. Colin J Limpus, C. Parmenter, D. Limpus (2025). Limpus, C. J., J. Parmenter, et al. (2000). The Status of Flatback Turtle, *Natator depressus*, in Eastern Australia. Proceedings of the twentieth annual symposium on sea turtle biology and conservation, Orlando, Florida, U.S.A., US Department of Commerce. Living Planet Index. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
9. Colin J. Limpus, Diane Anderson, Kyle Debets, Janine Ferguson, Leisa Fien, Duncan J. Limpus, Maree McLaren and Nicole Murnane (2025). Long-term monitoring of Loggerhead and Flatback Turtles in Queensland. Queensland Turtle Conservation Project: Data Report for Marine Turtle Breeding on the Woongarra Coast, 2021-2022 Breeding Season. Queensland Department of Environment, Tourism, Science and Innovation. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
10. Colin J. Limpus, Milani Chaloupka, Janine Ferguson, Nancy N. FitzSimmons, C. John Parmenter (2025). Model-based estimates of number of nesters of Flatback Turtle in Queensland. Limpus, C. et al. (2020) The Flatback turtle, *Natator depressus*, in Queensland: population size and trends. Department of Environment and Science, Brisbane. The State of Queensland and Gladstone Port Authority. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
11. Colin Limpus (2025). Long-term monitoring of Green Turtle nesting at North West Cape, WA. Limpus (2008). A Biological Review of Australian Marine Turtles: 2. Green Turtle *Chelonia mydas.* The State of Queensland. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

12. Colin Limpus (2025). Monitoring Loggerhead Turtles at multiple nesting sites. A Biological Review of Australian Marine Turtles. 1. Loggerhead Turtle *Caretta caretta* (Linneaus). Queensland Environmental Protection Agency. Queensland. The State of Queensland. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
13. Colin Limpus (2025). Monitoring Loggerhead Turtles at multiple sites. A Biological Review of Australian Marine Turtles. 1. Loggerhead Turtle *Caretta caretta* (Linneaus). Queensland Environmental Protection Agency. Queensland. The State of Queensland. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
14. D. R. Michael, D. G. Nimmo, E. Stevens, T. Schlen and S. Wassens (2025). Short-term monitoring of Grey Snake (*Hemiaspis damelii*) in south-western NSW. Michael et al. (2023). Finding Ngabi (*Hemiaspis damelii*): factors affecting the use of modified floodplain wetlands by an endangered snake. Wildlife Research 50, 1131-1140. Charles Sturt University. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
15. Darren M. Southwell, Danae Moore, Steve McAlpin, Edward M. J. Blackwood, Andrew Schubert, Kiwirrkurra Rangers, Adam S. Smart, Samuel D. Merson, Margarita Goumas, Nicholas A. Macgregor and Rachel M. Paltridge (2025). Long-term monitoring of Great Desert Skink in central Australia. Southwell, D. et al. (2025). Fire regimes drive population trends of a threatened lizard in the central and western deserts of Australia. Wildlife Research 52, WR24135. The University of Newcastle. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
16. DETSI (2025). Nangur spiny skink population monitoring program. Compiled by Dan Ferguson. Queensland Department of Environment, Tourism, Science and Innovation. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
17. Doody, J.S., Rhind, D., Green, B., Castellano, C., McHenry, C., Clulow, S. (2025). Long-term monitoring of monitor lizards in the Daly River catchment. Doody, J. S., et al. (2017). Chronic effects of an invasive species on an animal community. Ecology 98, 2093-2101. Living Planet Index. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
18. Groom, R. A., A. D. Griffiths, and M. Chaloupka (2025). Monitoring of Flatback Turtle nesting in the Northern Territory. Groom, R. A. et al. 2017. Estimating long-term trends in abundance and survival for nesting flatback turtles in Kakadu National Park, Australia. Endangered Species Research 32, 203-211. Living Planet Index. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
19. Hattingh, K., Richardson, P., Butcher, M. (2025). Monitoring of marine turtle nesting at Gnaraloo Station. Hattingh et al. (2013). Gnaraloo Turtle Conservation Program and Gnaraloo Feral Animal Control Program. Proceedings of the First Western Australian Marine Turtle Symposium 28-29th August 2012. Science Division, Department of Parks and Wildlife, Perth, Western Australia. Department of Biodiversity, Conservation and Attractions. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
20. Jonathan K. Webb, Chris J. Jolly, Meagan Hinds, Craig Adams, Santiago Cuartas-Villa, Yingyod Lapwong, Mike Letnic (2025). Long term monitoring of Broad-headed Snake in NSW. Webb et al. 2023: Effects of the Australian 2019-2020 megafires on a population of endangered broad-headed snakes *Hoplocephalus bungaroides*. Austral Ecology 48, 24-30. University of Technology Sydney. Aggregated

for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

21. Jordan A. Thomson (2025). Boat-based surveys of Loggerhead Turtles at Shark Bay. Thomson, J. (2011). Quantifying the Abundance, Distribution and Behaviour of a Generalist Marine Consumer, the Loggerhead Turtle, in Coastal Foraging Habitat, Shark Bay, Western Australia. PhD thesis, Simon Fraser University. Simon Fraser University. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
22. J-P. Emery, M.Hollanders, L.Valentine, B. Tiernan, K. Retallick, H. Cogger, J. C. Z. Woinarski & N. J. Mitchell (2025). Evaluation of trial reintroductions of two extinct in the wild reptile species on Christmas Island. Emery, J-P. et al. (2024). Evaluation of trial reintroductions of two extinct in the wild reptile species on Christmas Island. Animal Conservation 28, 19-32. The University of Southern Queensland. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
23. Julie Schofield, Aaron L. Fenner, Kelly Pelgrim, C. Michael Bull (2025). Short-term monitoring of Adelaide Pygmy Bluetongues in South Australia. Schofield et al. (2012). Male-biased movement in pygmy bluetongue lizards: implications for conservation. Wildlife Research 39, 677-684. Flinders University. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
24. Lukoschek, V., Beger, M., Ceccarelli, D., Richards, Z., Pratchett, M. (2025). Long-term monitoring of sea snakes at Ashmore Reef. Lukoschek, V., et al. (2013). Enigmatic declines of Australia sea snakes from a biodiversity hotspot. Biological Conservation 166, 191-202. Living Planet Index. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
25. Mariana A. Micheli-Campbell, Thomas Baumgartl, David T. Booth, Hamish A. Campbell, Marilyn Connell, Craig E Franklin (2025). Nesting counts of Mary River Turtles. Micheli-Campbell, M.A. et al. (2013). Selectivity and repeated use of nesting sites in a freshwater turtle. Herpetologica 69, 383-396. The University of Queensland. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
26. McFarlane, G., and A. Mueller (2025). Community monitoring of Flatback Turtle nesting activity at Cable Beach. McFarlane, G., and A. Mueller. 2013. Cable Beach Community-based Sea Turtle Monitoring Programme: The First Six Years. Proceedings of the First Western Australian Marine Turtle Symposium 28-29th August 2012. Science Division, Department of Parks and Wildlife, Perth, Western Australia. Living Planet Index. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
27. Milani Chaloupka, Karen A. Bjorndal, George H. Balazs, Alan B. Bolten, Llewellyn M. Ehrhart, Colin J. Limpus, Hiroyuki Suganuma, Sebastian Troëng and Manami Yamaguchi (2025). Long-term monitoring of Green Turtle nesting in the Great Barrier Reef. Chaloupka, M., et al. (2008). Encouraging outlook for recovery of a once severely exploited megaherbivore. Global Ecology and Biogeography 17, 297-304. Living Planet Index. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.
28. Milne, T., Bull, C.M., Hutchinson, M. (2025). Counts of occupied burrows for *Tiliqua adelaidensis* observed between 1993 and 1998. Milne, C. et al (2009). Characteristics of litters and juvenile dispersal in the endangered Australian skink *Tiliqua adelaidensis*. Journal of Herpetology, 36, 110-112. Flinders

University. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

29. NSW DCCEEW (2025). Monitoring of Manning River Turtles by NSW DCCEEW using trapping. Compiled by Andrew Steed. The State of New South Wales. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

30. O'Shea, M.B. (2025). Population monitoring of *Delma impar* using pitfall trapping. O'Shea, M.B. (2005). Methods for Assessment and Techniques for Management of Striped Legless Lizard *Delma impar* populations in South-eastern Australia. PhD thesis, Victoria University. Victoria University. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

31. Parks Victoria (2025). Monitoring of *Delma impar* in grassland reserves. Data compiled by James Neil. The State of Victoria. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

32. Pemberton, D., Wiltshire, A. (2025). Population estimates of Pedra Branca Skink, 1986-2000. Threatened Species Unit (2001). Pedra Branca Skink Recovery Plan. Department of Primary Industries, Water and Environment, Hobart. The State of Tasmania. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

33. Richard N. C. Milner, Danswell Starrs, William S. Osborne (2025). Testing the use of artificial shelters for supplementing habitat for Pink-tailed Worm Lizards. Milner et al. (2023). Worm-lizards, ants, and bricks: A low-impact monitoring method for the threatened Pink-tailed Worm-lizard *Aprasia parapulchella*. Austral Ecology 49, e13490. The University of Canberra. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

34. Scroggie, M.P., Peterson, G.N.L., Rohr, D.H., Nicholson, E., Heard, G.W. (2025). Nine-year monitoring of tile grids for vertebrates across western Victoria. Scroggie, M. et al. (2019). Disturbance has benefits as well as costs for fragmented populations of a cryptic grassland reptile. Landscape Ecology 34, 1949-1965. The State of Victoria. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

35. The State of New South Wales (2025). *Hoplocephalus bungaroides* monitoring - Saving our Species. NSW Department of Climate Change, Energy, the Environment and Water. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

36. The State of New South Wales (2025). *Liopholis guthega* monitoring - Saving our Species. NSW Department of Climate Change, Energy, the Environment and Water. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.

37. The State of New South Wales (2025). Long-term monitoring of the Canberra Earless Dragon. Compiled from: DCCEEW (2022). Consultation on Species Listing Eligibility and Conservation Actions. *Tympanocryptis lineata* (Canberra grassland earless dragon). DCCEEW, Canberra. The State of New South Wales. Aggregated for the Australian Threatened Species Index, an output of the NESP Threatened Species Recovery Hub and operated by the Terrestrial Ecosystem Research Network, The University of Queensland.