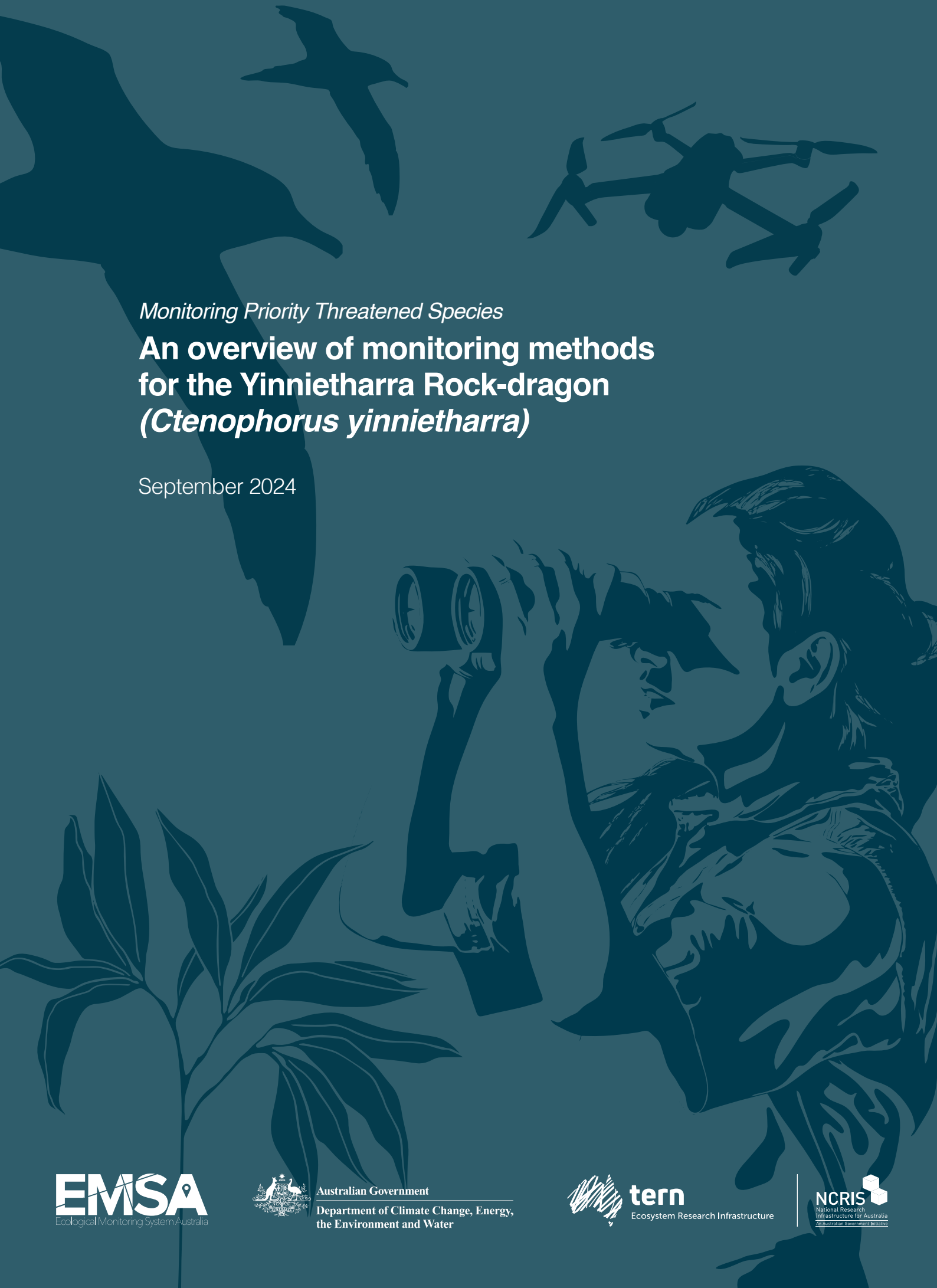

Monitoring Priority Threatened Species

An overview of monitoring methods for the Yinnietharra Rock-dragon *(Ctenophorus yinnietharra)*

September 2024

EMSA
Ecological Monitoring System Australia

Australian Government
Department of Climate Change, Energy, the Environment and Water

tern
Ecosystem Research Infrastructure

NCRIS
National Research Infrastructure for Australia
An Australian Government Initiative

Citation

TERN Australia (2024) Monitoring Priority Threatened Species: Overview of monitoring methods for the Yinnietharra Rock-dragon (*Ctenophorus yinnietharra*). Version 1. Report to the Department of Climate Change, Energy, the Environment and Water. TERN, Adelaide.

Version

Version 1.

Last updated: 2 September 2024

Acknowledgements and contributions

This work was funded by the Australian Government Department of Climate Change, Energy, the Environment and Water.

Acknowledgement of Country

We acknowledge the Traditional Custodians of Australia and their continuing connection to land and sea, waters, environment and community. We pay our respects to the Traditional Custodians of the lands we live and work on, their culture, and their Elders past and present.

Copyright

Disclaimer

About

This literature overview collates information on one of the 110 priority threatened species identified in the *Threatened Species Action Plan 2022-2032* and has been reviewed by invited practitioners experienced in monitoring the species.

The *Survey Guidelines for Monitoring Threatened Species* project, a collaboration of the Department of Climate Change, Energy, the Environment, and Water (DCCEEW) and the Terrestrial Ecosystem Research Network (TERN), aims to improve our knowledge of threatened species by enhancing accessibility and sharing of quality scientific threatened species data. By developing best practice field survey guidelines and recommendations, practitioners will be better equipped to conduct standardised, repeatable surveys.

By identifying the monitoring methods typically implemented by practitioners, documenting and assessing the techniques known to work, and identifying opportunities to standardise the methods, we can move towards ensuring all monitoring is species-appropriate, comparable between practitioners and populations, and repeatable over time. Further, together with consistent terminology, guidelines, instructions, and data collection, we can refine efforts and resources to measure and share information. Data collected using robust, standardised methods will improve our knowledge of threatened species and underpin threatened species recovery at scale. This project is essential to establishing monitoring protocols and data repositories to enhance the accessibility and sharing of threatened species data.

TERN has prepared the literature overviews for the Department of Climate Change, Energy, the Environment, and Water. For further information, please visit the EMSA Threatened Species Survey Guidelines website. Additional information, particularly monitoring methods and techniques not included that should be considered, can be brought to the author's attention by emailing tern@adelaide.edu.au for consideration for future updates.

Contents

1 Background

1.1 Conservation status and species trajectory

1. 1. 1 Current EPBC Act status

- Vulnerable

1.1.2 Summary of data held in the Threatened Species Index

The Threatened Species Index (TSX) provides reliable and robust measures of change in the relative abundance of Australia's threatened and near-threatened species at national, state and regional levels. Understanding these changes in species populations is crucial for monitoring Australia's conservation progress and allows users to measure and report on the benefits of conservation investments, and to justify and design targeted management responses. Currently, the index is restricted to birds, plants and mammals, with new groups to be added in the near future.

The TSX does not hold data on the Yinnietharra Rock-dragon. More information on the TSX, including how to contribute threatened species monitoring data to the index, can be found at tsx.org.au

1.2 Distribution

- The Yinnietharra Rock-dragon (*Ctenophorus yinnietharra*) currently occurs within an area of approximately 35 km^2 around the Gascoyne River on Yinnietharra Station, east of Carnarvon, Western Australia (Cogger *et al.* 1993).
- The species is currently only known from two localities within this area, 5 km east, and 25 km south-west of Yinnietharra (Storr 1981; Wilson and Knowles 1988; Cogger *et al.* 1993; DOE 2023).

1.3 Habitat

- Yinnietharra Rock-dragons inhabit granite outcrops separated by stony flats supporting *Acacia* tall open shrubland.
- Outcrops in the area are often less than one square metre and lower than half a metre high.
- The species appears to be restricted to rocks of one origin – Archean gneissic biotite granites and granodiorite – whilst nearby outcrops of Early Proterozoic migmatite are inhabited by a different species, the Ring-tailed Dragon (Ctenophorus caudicinctus; Cogger *et al.* 1993; DOE 2023).

1.4 Ecology

- Yinnietharra Rock-dragons have been observed running across gibber flats between granite outcrops,
- They bask on low rocks and climb *Acacia* shrubs.
- They seek refuge in narrow crevices in the rock, beneath exfoliating granite, in burrows under granite boulders, and hollow *Acacia* logs (Storr 1981; Wilson and Knowles 1988).
- Yinnietharra Rock-dragons are extremely wary, and dash for cover when approached (Wilson and Knowles 1988).

-

1.5 Threats

- Habitat degradation by pastoral activities and cattle and goat grazing.
- Boulder harvesting.
- Stochastic events that may affect the species due to its small population size (DEWHA 2008).

2 Existing monitoring methods

2.1 Summary of existing methods used

- Direct observation
- Direct observation: special techniques (specify) (e.g. spotlighting, burrow scopes, drone with camera)
- Signs (tracks, scats, hair-tubes) (includes opportune and sand plots)
- Signs – DNA/eDNA/eRNA
- Camera trapping
- Trapping – pitfall
- Trapping – Elliott/cage/or similar (ground)
- Trapping – Elliott/cage/or similar (in canopy)
- Refuge checks (burrows, dens, nests, caves, etc.)
- Aerial surveys
- Invertebrate techniques: (specify)

2.2 Existing survey requirements

- Optimal time of year/season/climate conditions (timing with resource availability, etc.)
  - The Yinnietharra Rock-dragon is diurnal and likely to be active at ground temperatures above 29°C (DSEWPC 2011).
  - Active individuals may be observed on and around the rock outcrops on warm days (spring to summer; Storr 1981). In colder weather, individuals are readily observed in the rock crevices (DSEWPC 2011).
  - Avoiding extreme summer temperatures is recommended.
- Optimal location of surveys
  - Only known from two localities on Yinnietharra Station.
  - Granite outcrops.
- Minimum survey effort
  - 1–2 days of active searching for surveys for new records or monitoring known populations within the 35 km^2 area that the species is currently known to occur.
  - Suggest 30 days of camera trap for monitoring known populations within the 35 km^2 area that the species is currently known to occur.
- Survey personnel
  - 2 people.
- Other factors:
  - Only occurs on private property.

2.3 Existing protocols

- None have been identified to date.
- The *Survey Guidelines for Australia's Threatened Reptiles* recommend active searching of rock outcrops on warm days (spring to summer), or in rock crevices in colder weather using torchlight or reflected sunlight (DSEWPC 2011).

2.4 Methods to consider further

The methods listed below have been identified as potential methods and techniques to survey for the species, either to identify presence or absence, or to assist determining population size and status. Further review of the literature and consultation with experts is required, particularly to identify and assess specific techniques for examining population ecology factors.

2.4.1 Available methods

- Camera trapping
  - Optimal mode of deployment for small reptiles.
  - Drift fencing to direct lizards into the camera trap detection zone.
  - Cork tiles in the detection zone to provide a uniform thermal background to improve temperature differential camera trap triggering.

2.4.2 Additional methods

- Active searching.

2.4.3 Methods to rule out

- While active searching, the thin exfoliations on many of the low outcroppings are readily damaged by lifting, and hence it is preferable to examine the crevices between outcrop and exfoliation by torchlight or reflected sunlight from an angled mirror without lifting the exfoliation.
- Whilst the species is only 8 cm in length and conducive to being trapped in pitfalls, establishing pitfalls in the rocky terrain they inhabit would prove difficult and cause significant disturbance (DSEWPC 2011).

2.4.4 Relevant Ecological Monitoring Standards Australia (EMSA) modules

The following Ecological Monitoring System Australia (EMSA) modules developed by TERN for the Australian Government should be considered for surveying the Yinnietharra Rock-dragon:

- Vertebrate fauna
- Camera traps

In addition, the Plot description, Floristics, Cover, Soils, Condition and Vegetation mapping modules may be beneficial for assessing the suitability of a location against the species' habitat preferences.

2.4.5 Other 110 priority species with potential links

- Although geographically isolated from the Yinnietharra Rock-dragon, the Arnhem Land Gorges Skink *(Bellatorias obiri)* is also currently known to be largely restricted to habitat characterised by outcrops containing fissures and crevices, so survey methods overlap.

3 Considerations for survey guidelines development

Key considerations should a full literature review and/or survey guidelines be developed for the Yinnietharra Rock-dragon are highlighted below.

Special equipment required

- Camera traps
- Bookend brackets to orientation camera traps face the ground
- Drift fence
- Cork tiles
- Torches

Estimated time and surveyor effort

- One day each to set up and retrieve camera traps for monitoring known populations within the 35 km^2 area that the species is currently known to occur.
- 1–2 days of active searching for surveys for new records or monitoring known populations within the 35 km^2 area that the species is currently known to occur.

Vegetation communities or landscapes of the species' preferred habitat not suitable for the optimal survey methods

- Not applicable/specialised habitat.

3.1 Key documents for further review

The documents listed below have been identified as key documents to review should a full literature review and/or survey guidelines be developed for the Yinnietharra Rock-dragon.

Protocols

- None have been identified to date.

Scientific papers and reports

- Three new agamid lizards from Western Australia (Storr 1981).
- A method for surveying diurnal terrestrial reptiles with passive infrared automatically triggered cameras (Welbourne 2013).

3.2 Key agencies and organisations involved in the species research and recovery

- Biodiversity and Conservation Science, Department of Biodiversity, Conservation and Attractions, Kensington, WA.
- Owners/managers of Yinnietharra Station.

4 References

Cogger, HG, Cameron, EE, Sadlier, RA, Eggler, P (1993) The Action Plan for Australian Reptiles. Endangered Species Project Number 124. Australian Nature Conservation Agency, Canberra.

DEWHA (2008) Approved Conservation Advice for Ctenophorus yinnietharra (Yinnietharra Rock-Dragon). Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.

DOE (2023) 'Ctenophorus yinnietharra in Species Profile and Threats Database.' Available at https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1603 [Accessed 14 March 2023].

DSEWPC (2011) Survey guidelines for Australia's threatened reptiles. Guidelines for detecting reptiles listed as threatened under the Environment Protection and Biodiversity Conservation Act 1999.

Storr, GM (1981) Three new agamid lizards from Western Australia. Records of the Western Australian Museum 8, 599–607.

Welbourne, D (2013) A method for surveying diurnal terrestrial reptiles with passive infrared automatically triggered cameras. Herpetological Review 44, 247–250.

Wilson, S, Knowles, D (1988) 'Australia's reptiles: a photographic reference to the terrestrial reptiles of Australia.' (Harper Collins: Sydney)

EMSA
Ecological Monitoring System Australia

emsa.tern.org.au