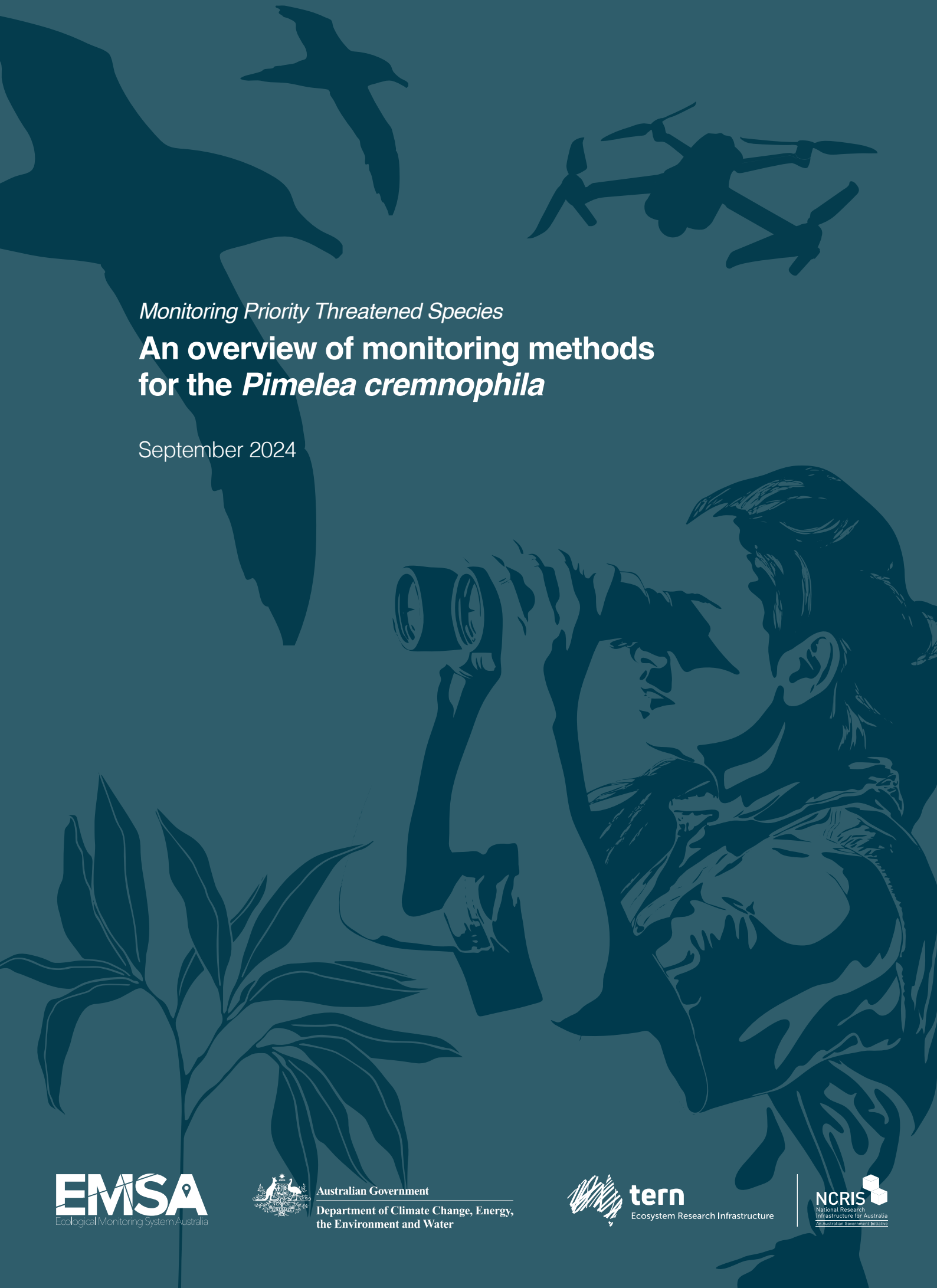

Monitoring Priority Threatened Species

An overview of monitoring methods for the *Pimelea cremnophila*

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

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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.

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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

- Critically endangered

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 *Pimelea cremnophila*. 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

- *Pimelea cremnophila* is known only from Oxley Wild Rivers National Park, approximately 40 km east of Walcha, New South Wales.
- A survey in 2008 identified three small subpopulations scattered along a 5 km stretch of a gorge rim (Copeland and Telford 2006).
- Surveys to locate additional populations conducted in suitable habitat since 2006, including a major survey in 2012–2013, have failed to locate any. However, there are still areas of potentially suitable habitat yet to be searched.
- In November 2015, a survey failed to find two of the three subpopulations, though the species may persist as seed in the soil seed bank.
- The species has an estimated area of occupancy and extent of occurrence of 4 km^2.
- The entire distribution of the three subpopulations identified in 2008 was severely burnt in the 2019–2020 bushfires and the entire site is still recovering after this event (Auld *et al.* 2020; NSW Government 2021).
- Surveys of the three known sub-population locations found 20 surviving plants at just one of these sites. All plants were healthy with no signs of browsing or insect attack (NSW Government 2021).

1.3 Habitat

- *Pimelea cremnophila* grows in a shallow, skeletal loam over metasediments on exposed cliff tops or more sheltered cliff-side sites with south-westerly to south-easterly aspects. Altitude ranges from 1050–1090 m (Copeland and Telford 2006).
- The species predominantly occurs within open forest of *Eucalyptus campanulata*, *E. retinens* and *Allocasuarina littoralis* with a shrubby understorey (Copeland and Telford 2006).
- The species has associations with A. littoralis, E. retinens, E. campanulata, Acacia blakei ssp. diphylla, Maytenus silvestris, Prostanthera rhombea, Dodonaea rhombifolia, Astrotricha longifolia, Ozothamnus obcordatus, Persoonia media, Callistemon sp. nov., Correa reflexa var.

reflexa, Lepidosperma elatius s.l., L. laterale, Rhodanthe sp. nov. and Notodanthonia longifolia (Copeland and Telford 2006).

1.4 Ecology

- *P. cremnophila* is likely to flower throughout spring. Flowers, floral buds and young fruits have been observed in October (TSSC 2021).
- The species has a dry/hard fruit and small hard seeds. It does not appear to have any conspicuous adaptations to assist seed dispersal.
- It has been suggested that *P. cremnophila* is likely to be dispersed by ants (myrmeconchory) like other species of the Thymelaeaceae family (Westoby *et al.* 1990; Benson and McDougall 2001). If so, its dispersal distance is likely to be low.
- The species is likely to maintain a long-lived, persistent, soil-stored seed bank as per other species of Thymelaeaceae (Fox 1988; Benson and McDougall 2001; Willis *et al.* 2003).
- The response to fire of *P. cremnophila* is poorly understood, but the species is suspected to be an obligate seeder (Copeland pers. comm. 2017; Benson and McDougall 2001).

1.5 Threats

- Grazing by feral goats.
- Extreme drought conditions.
- Inappropriate fire regimes.

2 Existing monitoring methods

2.1 Summary of existing methods used

- Active searching/opportune
- Plots
- Quadrats/transects

2.2 Existing survey requirements

- Optimal time of year/season/climate conditions (timing with resource availability, etc.)
  - During flowering from September to October.
- Optimal location of surveys
  - Oxley Wild Rivers National Park, along the rim of the Macleay River gorge at 1,050–1,090 m a.s.l. (Copeland and Telford 2006)" (TSSC 2021).
- Minimum survey effort
  - 2–3 days to monitor known populations (remote and rugged terrain).
  - 1–2 weeks if searching suitable habitat for new populations (depending on size, number and terrain of areas searched).
- Survey personnel
  - 2–4 people
- Other factors:
  - Very rugged habitat with steep gorge and cliff edge survey sites.

2.3 Existing protocols

- There are currently no survey guidelines for Australia's threatened plants (apart from orchids).
- For threatened flora in New South Wales, there are guidelines for *Surveying threatened plants and their habitats*, prepared by the Department of Planning, Industry and Environment (DPIE 2020).

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

- None available

2.4.2 Additional methods

- None available

2.4.3 Methods to rule out

- All survey methods typical for plants are considered suitable (no specific methods ruled out).

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 *Pimelea cremnophila:*

- Targeted surveys (for some reported locations)
- Opportune
- Recruitment
- Condition
- Photopoints
- Leaf tissue vouchering

In addition, the Plot description, Floristics, Cover, Soils 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

- Brush-tailed Rock-wallaby (*Petrogale penicillata*) – co-habits the same rugged habitats in Oxley Wild Rivers National Park.

3 Considerations for survey guidelines development

Key considerations should a full literature review and/or survey guidelines be developed for the *Pimelea cremnophilia* are highlighted below.

- Special equipment required
  - Possible helicopter hire (enabling the potential to undertake Brush-tailed rock wallaby surveys at same time)

    Oxley Wild Rivers National Park is very rugged with minimal road access. There are two known distribution areas located 25 km apart, which would require hours to drive between sites, and at least 2 km of scrub-bashing to walk (one way) to one known south-west cliff-edge site.

    Possible helicopter hire required for transport to survey sites for P. cremnophila at "exposed cliff tops or more sheltered cliff-side sites with south-westerly to southeasterly aspects. Altitude ranges from 1050–1090 m" (Copeland and Telford 2006).
- Estimated time and surveyor effort
  - Minimum 2–3 days to monitor known populations (remote and rugged terrain).
  - Allowing 1–2 weeks if searching suitable habitat for new populations (depending on size, number and terrain of areas searched).
  - Access to a helicopter will save time by reducing the transport times to and between sites.
- Vegetation communities or landscapes of the species' preferred habitat not suitable for the optimal survey methods
  - None have been identified to date.

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 *Pimelea cremnophilia*.

- Protocols
  - None have been identified to date.
- Scientific papers and reports
  - Copeland, L.M. & Telford, I.R.H. (2006). *Pimelea cremnophila* (Thymelaeaceae), a new species from the New England Tablelands escarpment of northern New South Wales. *Telopea* 11(2): 111-115.
  - Threatened Species Scientific Committee (2021). Conservation Advice *Pimelea cremnophila*. Canberra: Department of Agriculture, Water and the Environment.
  - Auld, T, Mackenzie, B, Le Breton, T, Keith, D, Ooi, M, Allen, S, Gallagher, R (2020) 'A preliminary assessment of the impact of the 2019/2020 fires on NSW plants of national significance. Unpublished report.'

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

- Lachlan Copeland, Eco Logical Australia, Coffs Harbour, NSW
- NSW National Parks and Wildlife Service, Department of Planning, Industry and Environment

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