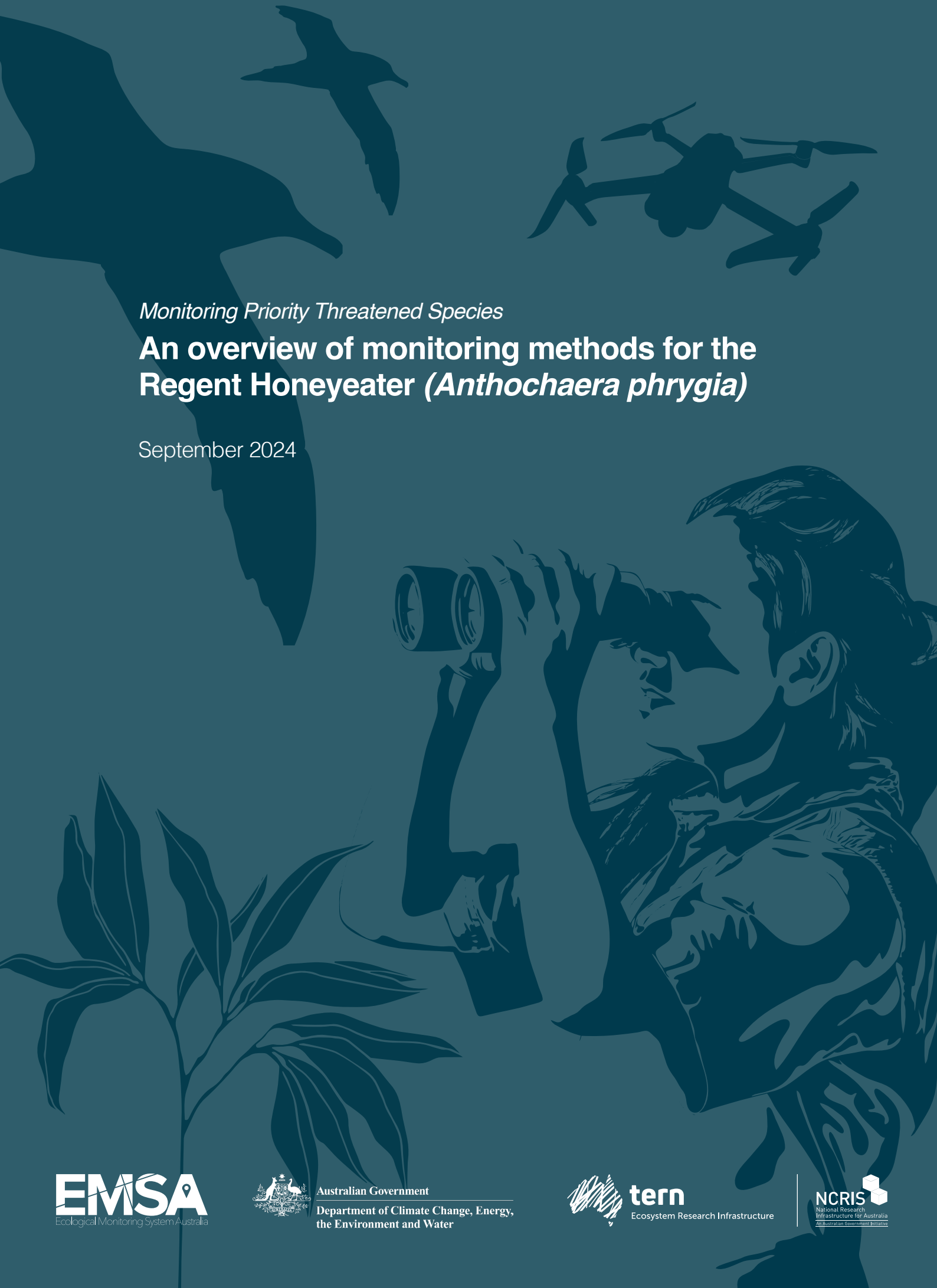

Monitoring Priority Threatened Species

An overview of monitoring methods for the Regent Honeyeater *(Anthochaera phrygia)*

September 2024

EMSA
Ecological Monitoring System Australia

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

tern
Ecosystem Research Infrastructure

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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.

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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 the Regent Honeyeater. 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

- Regent Honeyeaters have an extremely patchy distribution within a range stretching from south-east Queensland to central Victoria (Crates *et al.* 2021).
- Known key breeding areas are almost exclusively in New South Wales – the Capertee, Upper and Lower Hunter and Burgeoning Valleys, and the Bundarra-Barraba region. They now rarely breed successfully near Chiltern in Victoria (SWIFFT 2020).
- Regent Honeyeaters have patchy occurrence across up to 600 000 km^2 of south-eastern Australia (DOE 2016).

1.3 Habitat

- Regent Honeyeaters are commonly associated with box-ironbark eucalypt, where the species seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes (Menkhorst 1997; Geering and French 1998; Oliver *et al.* 1998; Oliver *et al.* 1999).
- Other forest types regularly utilised by Regent Honeyeaters include wet lowland coastal forests dominated by swamp mahogany (*Eucalyptus robusta*), spotted gum-ironbark associations and riverine woodlands (Menkhorst 1997; Geering and French 1998; Oliver *et al.* 1998; Oliver *et al.* 1999).
- This riparian habitat is also selected as a breeding habitat in some years (Geering and French 1998; Oliver *et al.* 1998; Oliver *et al.* 1999). Often this is adjacent to box-ironbark woodland. Remnant stands of timber, roadside reserves, travelling stock routes and street trees also provide important habitats for Regent Honeyeaters at certain times (Franklin *et al.* 1987; Franklin *et al.* 1989; Ley and Williams 1992; Webster and Menkhorst 1992; Oliver 1998).
- Mature, large individual trees are more important as they are more productive, particularly on highly fertile sites and in riparian areas (Webster and Menkhorst 1992; Oliver 2000). Trees in such areas grow larger (Soderquist and Mac Nally 2000) and produce more flowers (Wilson and Bennett 1999; DOE 2016).

1.4 Ecology

- It is estimated that a total population of less than 250 mature individuals remain (Garnett & Baker 2022, p. 624).
- Regent Honeyeaters build open-cup nests, typically in the outer branches of large trees, where they deposit 2-3 eggs (Higgins *et al.* 2001; Crates *et al.* 2021).
- Regent Honeyeaters are known to form socially monogamous pairs and nest in loose aggregations in association with the flowering of a select number of *Eucalyptus* tree species (Franklin *et al.* 1989). They breed from May to March, mostly from September to November (DEWHA 2010).
- Parents provision juveniles in separate family groups for 2–3 weeks post-fledging, almost exclusively within 200 m of the nest site (Crates *et al.* 2019).
- Post-breeding, Regent Honeyeaters form flocks consisting of adults and independent juveniles (Geering and French 1998).
- Honeyeaters feed on nectar from a range of eucalypts and mistletoe, as well as lerp, honeydew and insects (Oliver 2000).
- Honeyeaters engage in very complex movement patterns, mainly governed by the flowering of a small number of eucalypt species (Higgins *et al.* 2001). They are highly mobile (Ley *et al.* 1996) and can travel large distances in search of nectar resources (DEWHA 2010).

1.5 Threats

- Fires in 2019–2020 burnt 11% of all 1 x 1 km squares from which birds have been recorded since 1990 (G Ehmke unpublished). Historically, they occurred from Adelaide to 100 km north of Brisbane within 300 km of the coast (Franklin *et al.* 1989).
- There has been a rapid population decline since the 1960s (Franklin *et al.* 1989). This decline is primarily attributed to the extensive clearing of the preferred box– gum–ironbark woodland habitats (Ford *et al.* 1993; Ford *et al.* 2001), but the demographic factors underlying contemporary population trends are poorly understood (Clarke *et al.* 2003; Crates *et al.* 2017).
- Adverse effects of Noisy miners are understood to be a function of their local abundance (Piper and Catterall 2003)and observations indicate that the presence of a single pair of Noisy Miners poses a risk to Regent Honeyeater nest survival (Crates *et al.* 2019).

2 Existing monitoring methods

2.1 Summary of existing methods used

- Direct observation (e.g. Crates *et al.* 2019)
- Call surveys (e.g. Crates *et al.* 2019)
- Call playback surveys (e.g. Crates *et al.* 2019

2.1.1 Existing survey requirements

- Optimal time of year/season/climate conditions (timing with resource availability etc):

  For surveys related to breeding: May to March, particularly September to November (DEWHA 2010).

  For call playback surveys: immediately before and during breeding season (Geering and French 1998).

  For call surveys: outside of breeding season when birds are most vocal (DEWHA 2010)

- Optimal location of surveys:

  Key breeding sites in the Capertee Valley and Burragorang Valley in NSW (Crates et al. 2019).

- Minimum survey effort:

  For an area <50 ha 20 person-hours over 10 days is recommended (DEWHA 2010).

  For targeted searches of heavily flowering areas 20 person-hours over 5 days is recommended (DEWHA 2010).

- Survey personnel:

  2-4 people per area

- Other factors:

  Approximately 44% of nest locations used since 2015 were impacted by the 2019/20 bushfires (Crates *et al.* 2022).

2.1.2 Existing protocols

Existing protocols identified are identified in Table 1.

Table 1. Survey guidelines, protocols, and key resources that identify Regent Honeyeater monitoring methods

Protocol	Comments	Reference
Survey Guidelines for Australia's threatened birds	Recommends either area searches or targeted searches of heavily flowering trees and flocks of other blossom feeders, detecting birds by sighting or call.	DEWHA (2010)
Swift Parrot Search Volunteer Guide	Guidelines cover the Swift Parrot as well as other species such as the Regent Honeyeater. Details how to conduct a 5 minute, 50 m radius active search and how to document habitat features such as flowering and freshwater.	(BirdLife Australia 2021)

2.2 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.

2.2.1 Available methods

- Swift Parrot search guidelines
- Targeted survey
- Direct ground count

2.2.2 Additional methods

- Audio survey

2.2.3 Methods to rule out

- All survey methods typical for terrestrial birds are considered suitable (no specific methods ruled out)

2.2.4 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 Regent Honeyeater:

- Vertebrate Fauna Module
- Targeted Surveys Module
- Opportune Module.

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.

2.2.5 Other 110 priority species with potential links

- Avifauna with similar survey requirements:
- Black-eared Miner Manorina melanotis
- King Island Brown Thornbill Acanthiza pusilla magnirostris

3 Considerations for survey guidelines development

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

- Special equipment required:

  No specialist equipment required
- Estimated time/surveyor effort:

  At least 10 days for a <50 ha non-heavily flowering site.
- Vegetation communities or landscapes of the species' preferred habitat not suitable for the optimal survey methods

  Landscapes where vegetation is dense and obscures both sound and view, preventing observation of the birds.

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 Regent Honeyeater.

- Protocols

  Survey Guidelines for Australia's Threatened Birds (DEWHA 2010)

  Swift Parrot Search Volunteer Guide (BirdLife Australia 2021)
- Scientific papers and reports
  - Crates, R., Ingwersen, D., Roderick, M., Heinsohn, R. and Menkhorst, P. (2021) Regent Honeyeater Anthochaera phrygia. In The Action Plan for Australian Birds 2020. (Eds. S.T. Garnett and G.B. Baker) pp. 623–626. CSIRO Publishing, Melbourne.

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

- Fenner School, Australian National University, Canberra, ACT

  Dejan Stojanovic

  Ross Crates
- Recovery Team Coordinator, Dean Ingwersen, Birdlife Australia

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