

Superb Parrot Research Plan

LAST UPDATED:	22 November 2022
VERSION NO.	3
PREPARED FOR	Rye Park Renewable Energy Pty Ltd Contact: James Beckett Senior Environment and Development Planner m: +61 419 631 905 e: james.beckett@tiltrenewables.com
PREPARED BY	ACT Parks and Conservation Service, ACT Government Contact: Laura Rayner Senior Ecologist m: +61 418 414 487 e: laura.rayner@act.gov.au <i>on behalf of</i> National Superb Parrot Recovery Team Contact: Mark Carey Recovery Team Chair p: +61 2 6274 1873 e: mark.carey@awe.gov.au

Table of Contents

Table of Contents	1
1. Background.....	2
Superb Parrot ecology, research, and conservation	2
2. Purpose	3
Approval compliance	3
3. Project overview.....	4
The Superb Parrot Population Monitoring Program	4
4. Research significance.....	5
Recovery plan alignment	5
5. Scope of work.....	6
Objectives and proposed activities	6
Study area.....	7
Timeline of proposed activities.....	8
6. Investigators.....	8
Responsible parties	8
7. Funding schedule.....	9
8. Information sharing	9
9. References	10



Mr James Beckett
Senior Environment and Development Planner
Tilt Renewables
Level 23, 535 Bourke Street
MELBOURNE VIC 3000

EPBC 2020/8837: Rye Park Wind Farm – Superb Parrot Research Plan

Dear Mr Beckett

Thank you for your email dated 29 September 2022 to the department seeking approval of the above plan, in accordance with condition 18 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for EPBC 2020/8837.

Officers of the department have advised me on the plan and the requirements of the conditions of the approval for this project. On this basis, and as a delegate of the Minister for the Environment and Water, I have decided to approve the *Superb Parrot Research Plan, V3*, dated 22 November 2022. This approved research plan must now be implemented.

As you are aware, the department has an active monitoring program which includes monitoring inspections, desk top document reviews and audits. Please ensure that you maintain accurate records of all activities associated with, or relevant to, the conditions of approval so that they can be made available to the department on request.

Should you require any further information please contact Vaughn Cox at postapproval@dcceew.gov.au.

Yours sincerely

Kim Farrant,
Branch Head
Environment Assessments (Vic and Tas) and Post Approvals Branch
Environment Approvals Division

1 December 2022

1. Background

Superb Parrot ecology, research, and conservation

The Superb Parrot is a highly mobile open woodland bird, occurring throughout the inland slopes and plains of New South Wales (NSW), including the Australian Capital Territory (ACT), and extending into northern Victoria (VIC). The direction, drivers, and regularity of range-scale movements by Superb Parrots are unclear, but research by Manning *et al.* (2007) has identified a link between seasonal movements and plant productivity. Changes in food supply and drought are also likely to influence their interannual distributions.

PROJECT A	<p>Variability in local Superb Parrot abundances, due largely to their high mobility, impedes the development of reliable population estimates. As a result, experts disagree on Superb Parrot population size and trends. Best available estimates of Superb Parrot population change, based on repeated systematic monitoring surveys, suggest ongoing decline of the wild population across a substantial portion of their range, but with an increasing number of Superb Parrot sightings reported in the south-east. These regional trend patterns are consistent with bioclimatic modelling that predicts a contraction and south-eastward shift of Superb Parrot bioclimatic space due to the projected impacts of climate change (TSSC 2016).</p> <p>A case study of Superb Parrot habitat selection from the ACT confirms that the species will occupy different habitat types depending on their behavior and life stage. For example, Superb Parrots occupy open woodland for breeding, favours dense shrubby acacia stands for foraging, and uses tall mixed eucalypt trees for moving. Combining knowledge of habitat selection, with forecasts of habitable future climate space, offers a strong evidence base for formulating spatially targeted and temporally explicit conservation management recommendations.</p>
PROJECT B	<p>Long-term population monitoring is central to threatened species recovery planning. Designing monitoring programs that capture information about the frequency, location, and success of breeding attempts can illuminate factors limiting species population growth. Systematic monitoring data collection (<i>i.e.</i>, over multiple years and regions) allows for the comparison of reproductive output through space and time, which can enhance the design, implementation, and effectiveness of recovery action (Stojanovic <i>et al.</i> 2021). Further, a strong monitoring program will advance our knowledge of threatened species habitat selection and improve mapping of critical habitat features.</p> <p>As an obligate hollow nester, Superb Parrots rely on large, old, and senescing <i>Eucalyptus</i> trees to raise their young. Recent research (Stojanovic/Rayner <i>et al.</i> 2021) has shown that of the available hollows, <0.5% were suitable for the Superb Parrot in the south-east region. The study concludes that rarity of suitable nesting hollows may be a factor limiting the population growth and recovery of Superb Parrots. Mapping this resource across the Superb Parrots range will assist in efforts to protect and enhance critical breeding habitat for the species.</p>
PROJECT C	<p>Further concerns for the health of the Superb Parrot population stem from recent genetic analysis in the ACT by Stojanovic <i>et al.</i> (<i>in review</i>) that reveal strict monogamy, strong philopatry, and poor recruitment of young into the adult breeding population. In this system, the total breeding output of Superb Parrots was attributable to only 34 Superb Parrot breeding pairs, of which 13 bred repeatedly and produced 60% of nestlings born into the study area. Five of these repeat-breeding pairs produced 28% of all nestlings. This represents significant reproductive skew in the ACT population size, which is an early warning sign of low effective population size and inbreeding. This result flags poor nestling survivorship as a potential threat to Superb Parrot persistence. It is not known whether these findings are representative of the population genetic health of the species as a whole.</p>

In concert, new research cited above calls for increased investment in strategic Superb Parrot population monitoring across multiple scales (*i.e.*, range, region, site, nest) to determine if patterns of concern (*i.e.*, range shift, hollow decline, poor recruitment, reproductive skew) apply to regions and subpopulations beyond the ACT. **This Research Plan details a new Superb Parrot Population Monitoring Program to advance these lines of investigation and meet the compliance requirements outlined below.**

2. Purpose

Approval compliance

The Superb Parrot is listed as *Vulnerable* under Federal and State (NSW, ACT, VIC) legislation. Activities outlined in this Research Plan form the basis of a Superb Parrot Population Monitoring Program (hereafter **SPPMP**), which is required by the approval made under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC 2020/8837; the **EPBC Approval**) for the Rye Park Wind Farm Project (the **Project**), which is proposed by Rye Park Renewable Energy Pty Ltd (**RPRE**). This SPPMP addresses the relevant approval conditions in the EPBC Approval in relation to impacts on the Superb Parrot as follows:

Condition	SPPMP Reference
18 To compensate for potential cumulative impacts on the Superb Parrot, the approval holder must prepare and implement a Superb Parrot Population Monitoring Program (SPPMP). The SPPMP must be submitted to the Minister for approval prior to commencement of commissioning.	This Plan
19 The approval holder must not commence commissioning unless the Minister has approved the SPPMP. The approval holder must implement the approved SPPMP.	N/A
20 The implementation of the SPPMP must increase contemporary knowledge of Superb Parrot habitat use and breeding ecology within the <i>South-west Slopes of NSW Important Bird Area</i> , with a focus on identification of key breeding sites, and a better understanding of local movement patterns during the breeding season and landscape scale movements between the key breeding areas and winter foraging grounds.	Section 3 Section 5
21 The SPPMP must support the recovery objectives and actions described in the National Recovery Plan for the Superb Parrot <i>Polytelis swainsonii</i> . The SPPMP must include:	Section 4
a. specific conservation research and monitoring objectives and proposed activities, additional to any required under the approved BBAMP, to achieve the objectives;	Section 5
b. proposed timing, effort and expertise required for each activity;	Section 5
c. nomination of suitably qualified persons or organisations responsible for carrying out the activities;	Section 6
d. commitments for the provision and timing of funding; and	Section 7
e. mechanisms to ensure that knowledge and information gained from the SPPMP is easily accessible and can be used by the department, the general public and the scientific community.	Section 8
22 The approval holder must provide \$250,000 over three (3) years, indexed in line with CPI for each year on the date of this approval, to fund the conservation research activities specified in the approved SPPMP. The contributions are to be made as specified in the table below.	Section 7
Year 1 (2023)	\$79,800 (GST exclusive)
Year 2 (2024)	\$79,800 (GST exclusive)
Year 3 (2025)	\$90,400 (GST exclusive)
The first contribution must be made prior to the commencement of commissioning , and no later than 30 June 2023. Subsequent annual contributions must be made within 20 business days of the anniversary of the date of the first contribution.	

3. Project overview

The Superb Parrot Population Monitoring Program

To meet the approval conditions of a new SPPMP and address the most pressing conservation questions for the species, we propose three multi-scale monitoring projects as follows:

PROJECT A	<p>Aim: Develop climate-adapted regional conservation priorities for the Superb Parrot</p> <p>To date, there has been no concerted effort to assess evidence for climate impacts on the Superb Parrot population to determine where the species may require strategic conservation intervention and what actions may serve to address or mitigate projected climate impacts. If we assume the mobility of Superb Parrots will facilitate their projected range shift (TCCS 2016) by allowing the species to track their future bioclimatic niche, we have an opportunity to prepare landscapes to support Superb Parrots in their movement to, and occupancy of, future habitats.</p> <p>Outcomes of this project will be:</p> <ol style="list-style-type: none"> 1. A quantitative assessment of climate change impacts on the regional population trends of the Superb Parrot; and 2. Regional-scale summaries of projected Superb Parrot distribution change and habitat suitability to inform Superb Parrot conservation decision-making.
PROJECT B	<p>Aim: Design and implement a range-wide population monitoring program for the Superb Parrot</p> <p>To date, there is no coordinated, robust, range-wide population monitoring program for the Superb Parrot. Range-scale monitoring data are the best means for understanding (i) the distribution and availability of habitat resources, and (ii) the distribution and severity of threats, that are critical to the persistence of a wild self-sustaining Superb Parrot population.</p> <p>Outcomes of this project will be:</p> <ol style="list-style-type: none"> 1. A statistically robust network of permanent monitoring sites designed for the systematic long-term collection of Superb Parrot occupancy data; 2. A preliminary national database of Superb Parrot breeding resources (<i>i.e.</i> nest trees and nest hollows); and 3. A preliminary assessment of Superb Parrot nest survival and reproductive output across the contemporary range of the species.
PROJECT C	<p>Aim: Quantify key life history parameters to model demographic trends in Superb Parrots</p> <p>Understanding demographic trends in wildlife using approaches like Population Viability Analysis (PVA) require robust information about multiple aspects of life history. This information must be representative of the population as a whole and span multiple years to offer robust and robust insights into population growth and trends. Currently, this information is unavailable, which is a barrier to even basic estimates of conservation status, let alone more complex PVA.</p> <p>Outcomes of this project will be:</p> <ol style="list-style-type: none"> 1. Quantification of key life history parameters of Superb Parrots across their range: juvenile recruitment rates, population genetic spatial structure and diversity, breeding population size, reproductive skew, breeding biology and individual survival rates of breeders 2. Preliminary PVA using the data collected in this project to evaluate demographic sensitivity of Superb Parrots to key life history parameters

4. Research significance

Recovery plan alignment

Actions listed in the National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (2021) that are addressed or advanced by the proposed SPPMP are tabulated below.

Strategy / Action	Description	Performance criteria to be delivered
S1 / 1.1	Identify areas of high conservation significance and habitat critical to the survival of Superb Parrot	<ul style="list-style-type: none"> » Existing and new information has been reviewed and used to identify regions of conservation significance » New knowledge has been used to refine the definition of 'habitat critical to the survival'
S1 / 1.4	Review and revise as appropriate Superb Parrot management priorities, recommendations, planning tools and procedures...	<ul style="list-style-type: none"> » New information on breeding and foraging locations has been incorporated into the existing regulations, codes of practice, management recommendations, and planning tools and procedures to better manage the Superb Parrot population across its range
S2 / 2.1	Examine the use of known Superb Parrot nest hollows by introduced and native species...	<ul style="list-style-type: none"> » Through the use of cameras or other non-invasive surveying techniques, the species competing for Superb Parrot hollows (both introduced and native) have been identified throughout its range
S3 / 3.1	Design and implement an ecologically meaningful long-term monitoring program for the superb parrot	<ul style="list-style-type: none"> » A standardised survey technique has been developed that is suitable across the species' range, providing comparable data between different regions » Monitoring has occurred seasonally at key locations across a representative climatic gradient » Known nesting colonies have been mapped and monitored annually
S3 / 3.2	Analyze survey data to assess national and regional population trends	<ul style="list-style-type: none"> » Population trends have been assessed for key locations and, where possible, other locations as data becomes available
S3 / 3.4	Use genetic techniques to determine population structure...	<ul style="list-style-type: none"> » Genetic techniques have been used to increase knowledge of population and demographic processes...
S5 / 5.1	Continue to raise awareness and educate the general public about Superb Parrot conservation	<ul style="list-style-type: none"> » Articles and posts about Superb Parrot conservation are published in newsletters, local bulletins, and on relevant social media pages
S5 / 5.2	Train and involve community volunteers and landholders in the location and identification of birds, ... and encourage community reporting of Superb Parrots	<ul style="list-style-type: none"> » Where appropriate, opportunities have been provided for citizen scientists to participate in research projects related to recovery actions » Increased community involvement in reporting of sightings and population monitoring can be demonstrated
S6 / 6.5	Facilitate knowledge exchange and awareness between relevant threatened species and land managers, researchers, and decision makers	<ul style="list-style-type: none"> » Meetings between land managers and researchers has occurred at least biennially to share knowledge and experience of woodland birds and their habitats

5. Scope of work

Objectives and proposed activities

PROJECT A

Objective A1: Examine evidence for contemporary climate change impacts on Superb Parrots

Approach: There exists several independent, non-targeted, long-term bird monitoring programs within the Superb Parrot's extent of occurrence that may be (i) interrogated for evidence of regional population change, and (ii) related to projections of future climatic suitability. Here, we are proposing a meta-analysis of population trend estimates from independent monitoring programs to develop a standardised metric of population change that can then be related to the projected change in bioclimatic space within that monitoring program footprint.

Objective A2: Develop regional land management recommendations for Superb Parrots

Approach: Once establishing evidence for the relationship (or otherwise) between climate change and Superb Parrot population trajectories, there is an opportunity to combine spatial modelling of future bioclimatic space with contemporary predictions of habitat suitability to develop regional land management priorities (e.g., habitat enhancement, connectivity plantings, hollow supplementation). Discrete evidence-based conservation recommendations at scales relevant to land managers would be a significant advance in recovery planning for the species. Here, we are proposing to build a range-wide Species Distribution Model for the Superb Parrot using enriched sightings data that capture breeding, foraging and movement information.

PROJECT B

Objective B1: Establish a network of long-term Superb Parrot monitoring sites

Approach: This program will establish permanent survey sites in the South-west Slopes of NSW Important Bird Area and implement consistent population monitoring for two years. We have extensive experience in the design, development and implementation of monitoring (Stojanovic *et al.* 2021), and we will (i) identify survey locations of ecological relevance to Superb Parrots, based on the results of Project A and other knowledge, (ii) implement occupancy-style monitoring at those sites, with a particular focus on identifying nesting locations that will serve as a foundation for further detailed monitoring within locally occupied areas (Objective B3 below). This approach will be foundational to assess landscape-scale breeding resource availability for Superb Parrots. By identifying Superb Parrot occupancy at sites (both breeding and non-breeding), we will identify the key habitat features preferred by the species, and provide new insight into the availability, distribution, and density of suitable habitat at an unprecedented geographic scale.

Objective B2: Identify drivers of regional variation in the reproductive output of Superb Parrots

Approach: The monitoring program will yield a regional-scale network of survey locations that represent a cross section of Superb Parrot habitats. Within survey sites, whenever occupancy by Superb Parrots is confirmed, we will follow-up with more detailed searches for nesting activity. The location and characteristics of nesting habitat will be recorded, yielding new information on the distribution and abundance of critical nesting sites. Identified nests will receive further research (Objective B3, Project C) to yield detailed insights into life history variation over the species' range.

Objective B3: Quantify reproductive output and nesting success of Superb Parrots

Approach: We will implement a detailed nest monitoring protocol at active Superb Parrot nests to determine clutch and brood sizes, the number of fledglings, nest fate, and identify predators and competitors. Using tree climbing and motion-activated cameras, we will monitor nests from their point of discovery until they meet their fate. This information will reveal spatial and temporal variation in the breeding biology of Superb Parrots, and provide vital information for future efforts to both improve local nesting success, and inform PVA (Objective C2). Furthermore, using techniques we have already implemented successfully in ACT, we will use nest monitoring as an opportunity to develop a bank of genetic samples that will be critical for Project C.

Objective C1: Quantify key life history parameters for Superb Parrots

Approach: This objective will be met using genetic analysis of the samples collected by Project B (Objective B3). Using genetics, we will identify all individual Superb Parrots sampled in the monitoring program and, using techniques that estimate molecular relatedness among individuals, we will identify who breeds, who their offspring are, and whether offspring recruit to breed later. We will use spatial genetic analysis to look for geographic structuring of the superb parrot population (*i.e.*, identifying conservation sub-units) and look for signs of trouble (*e.g.*, low genetic diversity, inbreeding, reproductive skew) at both multiple scales. Using genetics, we will also be able to ascertain an index of individual survival rates by looking for the same individuals breeding at given sites over time. We will also evaluate the effective population size of Superb Parrots, both at local and range-wide scales. This will be directly informative for conservation assessments and provide a baseline metric against which future changes can be evaluated.

Objective C2: Evaluate demographic trends of Superb Parrots

Approach: The data we collect in Projects B and C will be used to contribute to a preliminary PVA on Superb Parrots that aims to specifically identify the sensitivity of the species to different stressors on individual aspects of life history. PVAs require detailed information on a range of aspects of life history (*e.g.*, number of populations, genetic diversity, population size, reproductive success, survival rates) and the preceding steps will all contribute different elements necessary to fit a robust PVA. Using PVA, we will evaluate the impact of variation in life history parameters on demographic trends (population size and growth rates). This will enable us to identify local populations that may be in trouble based on our field observations during monitoring, and crucially, will identify the aspects of life history that could be targeted for management intervention. A key focus of this objective is to contrast the demographic differences between urban and agricultural populations of Superb Parrots, and the field data we collect will help inform the differences between modelled populations.

Study area

The SPPMP will be implemented within the *South-west Slopes of NSW Important Bird Area* (hereafter **IBA**; see Figure 1) and, in some cases, beyond.

Specifically:

- » **Objectives A1 and A2** will be addressed across the Superb Parrot's total extent of occurrence, including the IBA. Preliminary climate modelling (TSSC 2016) indicates much of the species' future hospitable climate will be concentrated in the IBA.
- » **Objectives B1** will establish permanent survey sites across breeding and wintering areas within the IBA.
- » **Objectives B2 and B3** will focus on the identification of key breeding sites within the IBA, with particular focus in regions like Wagga Wagga and Cowra where breeding activity is confirmed, but data are particularly sparse.
- » **Objectives C1 and C2** will use data collected by Project B and, therefore, will be directly relevant to the IBA.

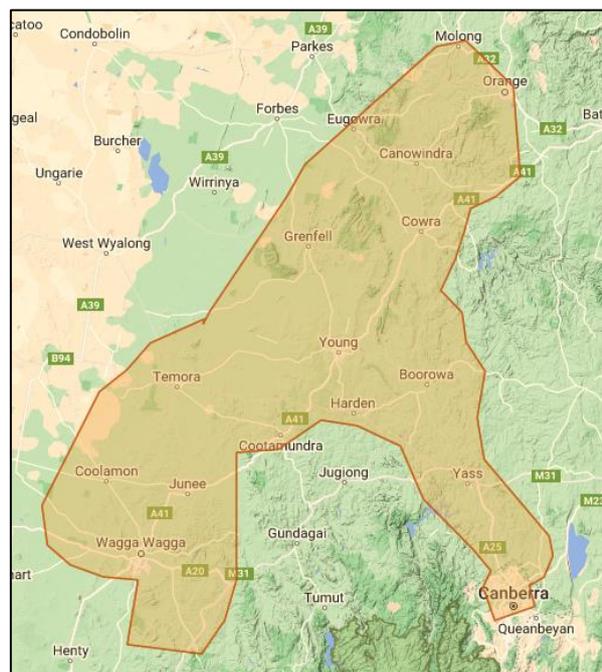


Figure 1: South-west Slopes of NSW Important Bird Area

Timeline of proposed activities

A proposed timeline of research activities for SPPMP is as follows:

		Year 1 2023-2024				Year 2 2024-2025				Year 3 2025-2026			
		Q1 Win '23	Q2 Spr '23	Q3 Sum '24	Q4 Aut '24	Q1 Win '24	Q2 Spr '24	Q3 Sum '25	Q4 Aut '25	Q1 Win '26	Q2 Spr '26	Q3 Sum '27	Q4 Aut '27
Project A	Obj. A1												
	Obj. A2												
Project B	Obj. B1												
	Obj. B2												
	Obj. B3												
Project C	Obj. C1												
	Obj. C2												
Team Meetings													

The proposed key performance indicators for the SPPMP are:

Key performance indicator	Responsible party	Delivery date
Biannual progress updates	EPSDD & RPRE	August meeting (2023,2024,2025) March meeting (2024,2025,2026)
SPPMP Annual Reports: Year 1 & 2	EPSDD	Annual Report 1: 30 July 2024 Annual Report 2: 30 July 2025
SPPMP Closure Report: Year 3	EPSDD	Closure Report: 30 July 2026
Payment of annual funding deposits	RPRE	Annually. Date to be confirmed pending approval timing of SPPMP; noting first contribution must be made prior to the commencement of commissioning, and no later than 30 June 2023.
Preparation of compliance reporting to the Department	RPRE	In accordance with condition 29 of EPBC Approval

6. Investigators

Responsible parties

The SPPMP has been co-developed with the **National Superb Parrot Recovery Team** and will be implemented as collaborative research by the Environment, Planning and Sustainable Development Directorate (ACT Government; hereafter **EPSDD**) and the Fenner School of Environment and Society (Australian National University; hereafter **ANU**).

The established EPSDD-ANU research team have completed detailed population research on Superb Parrots since 2015, with demonstrated experience in finding, monitoring, and tracking Superb Parrots. EPSDD has coordinated and funded the ACT Superb Parrot Conservation Research Program for the last seven years to deliver cutting-edge scientific evidence and management advice to regional land managers. ANU ecologists are highly experienced in developing and implementing large-scale monitoring programs for threatened and mobile species, developing many of the techniques necessary for monitoring nomadic birds at the broad scales proposed in the SPPMP. Nominated roles for implementing the SPPMP are as follows:

PROGRAM LEADER: [Dr Laura Rayner](#) (EPSDD) is a conservation ecologist and an expert in the design, implementation, and evaluation of threatened species research programs. Dr Rayner has developed robust protocols for the collection of population data for the Superb Parrot, Gang-gang Cockatoo, and Regent Honeyeater. Dr Rayner will contribute her specialist expertise in Superb Parrot monitoring to the SPPMP. **Dr Rayner is the senior responsible officer for the SPPMP and will lead the delivery of Project A.**

PRIMARY INVESTIGATOR: [Dr Dejan Stojanovic](#) (ANU) is a conservation biologist and an expert in the ecology of declining parrot populations. Dr Stojanovic established the Difficult Bird Research Group, which undertakes intensive field research and conservation intervention to assist birds at greatest risk of extinction. Dr Stojanovic will contribute his specialist expertise in parrot biology to the SPPMP. **Dr Stojanovic will lead the delivery of Project C.**

PRIMARY INVESTIGATOR: [Professor Adrian Manning](#) (ANU) is an internationally recognised restoration ecologist with extensive experience in the design and leadership of large-scale woodland research projects. Prof Manning is a world authority on Superb Parrots having published the most scientific peer-reviewed articles on the ecology of the species. **Prof Manning will provide conceptual oversight on the SPPMP.**

SPPMP RESEARCH OFFICER: (EPSDD). A skilled research officer with demonstrated experience in Australian bird research will be recruited. **The Research Officer will lead the delivery of Project B.**

7. Funding schedule

The proposed funding schedule is as follows:

ITEM	YEAR 1 2023-24	YEAR 2 2024-25	YEAR 3 2025-26	TOTAL
Salary EPSDD Program Leader (Rayner: 0.3 FTE)	In-kind	In-kind	In-kind	\$0
Salary ANU Primary Investigator (Stojanovic: 0.1 FTE)	\$6,000	\$7,000	\$15,000	\$28,000
Salary ANU Primary Investigator (Manning: 0.05 FTE)	In-kind	In-kind	In-kind	\$0
Salary EPSDD Research Officer (TBD: 0.7 FTE)	\$65,000	\$65,000	\$65,000	\$195,000
Travel Flights, mileage, field expenses	\$5,000	\$4,000	\$0	\$10,000
Lab Genetic sampling, data extraction	\$0	\$0	\$6,000	\$6,000
SPPMP contingency ~5% on subtotal	\$3,800	\$3,800	\$4,400	\$12,000
TOTAL	\$79,800	\$79,800	\$90,400	\$250,000

8. Information sharing

The data generated in the SPPMP will be made available in several ways:

Shared data repositories – Data collected during monitoring efforts will be stored by the ACT Government. These data will be held securely and made available to interested parties by data license agreement.

Scientific publications – Our intention is that the findings of this program be synthesized and made publicly available via scientific publications. These have the advantage over raw data in that analysis and interpretation have been achieved, and often, scientific journals require that the data used to support publications in open repositories, such as Data Dryad.

Popular media – Critical to the dissemination of scientific research is the use of popular media to reach wide audiences. All findings of scientific publications will be prepared for media release through a range of outlets.

Direct advice – Findings of our study will have implications for land managers, especially in regions identified in the PVA step as having elements of life history that are indicative that Superb Parrots may require conservation assistance. We will provide our findings to local conservation authorities both directly (e.g., during regular contact, which will need to be established to deliver our monitoring) and also more formally by developing fact sheets that summarise our findings specifically for use by management agencies.

9. References

- Manning, A. D., Lindenmayer, D. B., Barry, S. C. and Nix, H. A. (2007) Large-scale spatial and temporal dynamics of the vulnerable and highly mobile superb parrot. *Journal of Biogeography*, 34, 289-304.
- Stojanovic, D., Rayner, L., Cobden, M., Davey, C., Harris, S., Heinsohn, R., *et al.* (2021) Suitable nesting sites for specialized cavity dependent wildlife are rare in woodlands. *Forest Ecology & Management*, 483, 118718.
- Stojanovic, D., Rayner, L., Tulloch, A., Crates, R., Webb, M., Ingwersen, D., Runge, C. and Heinsohn, R. (2022). A range-wide monitoring programme for a critically endangered nomadic bird. *Austral Ecology*, 47, 251-260.
- Stojanovic, D., McLennan, E., Olah, G., Cobden, M., Heinsohn, R., Manning, A. D., *et al.* (In Review). Spatial genetic structure at small scales may be explained by social behaviors of a mobile bird. *Molecular Ecology*.
- TSSC (2016). *Conservation Advice: Polytelis swainsonii Superb Parrot*. Threatened Species Scientific Committee (Ed.). The Commonwealth Government of Australia, Canberra, Australia.