

Superb Parrot Conservation Research Plan

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Superb Parrot Conservation Research Plan – Coppabella Wind Farm

This plan has been prepared on behalf of Coppabella Wind Farm Pty Ltd, by representatives of the National Superb Parrot Recovery Team. It is consistent with the National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (2011).

1. BACKGROUND *The Superb Parrot*

The Superb Parrot is an open woodland bird species 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 Superb Parrot breeding range is located west of the Great Dividing Range, mostly within box-gum woodlands of the South-west Slopes, and riverine forests of the Riverina. Superb Parrots breed singly or in loose colonies, from September to December. An obligate hollow nester, Superb Parrots rely on large, old, and senescing Eucalyptus trees to raise their young.

Superb Parrots are highly mobile, but their movement ecology is poorly understood (**Project A**). The Superb Parrot National Recovery Plan (2011) highlights that the Superb Parrot has been variously considered nomadic, resident, dispersive, migratory, and partly migratory. The direction, drivers, and regularity of range-scale movements by Superb Parrots are unclear, but research suggests a link between seasonal movements and plant productivity and, potentially, changes in food supply and drought impacts.

Variability in local Superb Parrot abundances, due primarily to the species' high mobility, impedes reliable population estimates. As a result, agreement on Superb Parrot population size and growth is lacking among experts (**Project B**). 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 in the ACT region. 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 (**Project C**).

Recovery actions for Superb Parrots focus on addressing data deficiencies related to the location and condition of breeding, foraging and wintering habitat, and developing conservation tools to support the protection and restoration of those habitats.

2. PURPOSE *Commonwealth (EPBC) approval compliance*

The Superb Parrot is currently listed as Vulnerable under Federal and State (NSW, ACT, VIC) legislation. Research outlined in this proposal forms the basis of a *Superb Parrot Conservation Research Plan* (hereafter **SPCRP**) that will address Commonwealth approval conditions applied to the Coppabella Wind Farm development (**referral number 2017/8129**) that occurs within the range of the Superb Parrot, which are:

Condition	Reference
<p>15 To compensate for potential cumulative impacts on Superb Parrot, the approval holder must prepare and implement a Superb Parrot Conservation Research Plan (SPCRP).</p> <p>The SPCRP must be submitted to the Minister for approval prior to commencement of the action. The action must not commence unless the Minister has approved the SPCRP. The approved SPCRP must be implemented.</p>	This Plan
<p>The SPCRP must contribute to better understanding Superb Parrot habitat use and breeding ecology, with a focus on identification of key breeding sites, and on better understanding local movement patterns during the breeding season and landscape scale movements between the key breeding areas and the winter foraging grounds.</p>	Sections 3 & 4
<p>The SPCRP must contain, but is not limited to, the following:</p> <ol style="list-style-type: none"> Conservation research activities consistent with the <i>National Recovery Plan for the Superb Parrot Polytelis swainsonii</i> (2011) and reflect input and advice from the National Superb Parrot Recovery Team. Specific project objectives, indicative timetable for activities, nomination of persons or organisations responsible for carrying out the activities, and outline commitments to the provision and timing of funding. 	<p>Section 5 & 6</p> <p>Sections 6, 7 & 8</p>
<p>16 The approval holder must provide at least \$100,000 each year for five years to fund the conservation research activities outlined in the SPCRP. The first year's contribution must be made within 20 business days from the commencement of the action.</p>	Section 9

3. PROJECT OVERVIEW *Primary aims of proposed research*

To meet the approval conditions of a new SPCRP for Coppabella Wind Farm, we propose three projects, as follows:

Project A will address the primary knowledge gap hindering effective conservation action for the Superb Parrot: a lack of understanding of the species' long-range movements between breeding and wintering habitats. The work will identify and describe Superb Parrot migratory flight paths and critical breeding and wintering locations across the range. Project A will also collect data on fine-scale foraging movements of nesting Superb Parrots during the breeding season to identify local resources and threats that may influence population growth.

Project B will address several leading National Recovery Plan objectives by locating Superb Parrot breeding colonies, and monitoring their productivity, over the life of the SPCRP (five years). Data collection will be concentrated in the Riverina bioregion where future climate impacts are predicted, and where Superb Parrot conservation action will be vital for protecting the species in perpetuity. These data will inform a better understanding of Superb Parrot resource use and nest success. Project B will also provide a robust contemporary assessment of Superb Parrot conservation status. This will include the elicitation of trend indices at multiple spatial scales across the species' range.

Project C will address the need for improved strategic planning of Superb Parrot recovery actions under future climate change. Project C will draw together information on Superb Parrot sightings and relevant environmental factors (e.g. weather, climate, vegetation, fire), with new data from SPCRP Projects A and B to (i) assess the evidence for climate change impacts on the Superb Parrot, and (ii) develop land management guidelines for Superb Parrot recovery, including long-term spatially-explicit habitat enhancement priorities.

4. SCOPE OF WORK *Objectives and approach of proposed research*

Project-specific objectives are detailed below. An adaptive management approach is advised, where objectives can be reviewed annually, and priorities reassessed in collaboration with relevant stakeholders to determine if changes to the SPCRP are required.

PROJECT A To better understand local and regional movements of Superb Parrots

Objectives:

- Deploy local- and long-range GPS transmitters on wild Superb Parrots
- Identify landscape features that influence Superb Parrot movement
- Examine temporal patterns in Superb Parrot migratory movements
- Locate and describe Superb Parrot foraging habitat

Approach: Project A will be undertaken primarily as a PhD research project. Project A will aim to deploy 9 ARGOS Pin-point Solar GPS transmitters on wild Superb Parrots over three years. ARGOS transmitters have been provided to the project in kind by the NSW Biodiversity Conservation Division (NSW Government, formerly Office of Environment and Heritage) and will be used for multi-year range-wide tracking of Superb Parrots between wintering and breeding habitat. Long-range tracking will first be undertaken at known breeding locations (e.g. Canberra, Boorowa), then expanded to other parts of the Superb Parrot range, where possible. The capture of wild birds, and local tracking of breeding adults (using Ecotone Alle-100 UHF GPS loggers), will follow tested and approved protocols developed as part of the ACT Superb Parrot Monitoring and Research Program (**ACT SPMRP**; see Section 10).

PROJECT B To update knowledge on the breeding ecology and conservation status of Superb Parrots

Objectives:

- Locate breeding Superb Parrots in the Riverina bioregion and monitor annual productivity
- Measure and describe Superb Parrot breeding habitat and critical nesting resources
- Generate regional trend profiles for the Superb Parrot

Approach: Project B will be led by the EPSDD Ecologist and PhD student, and supported by a Research Assistant. From September to February, Project B will aim to locate and undertake monitoring of Superb Parrot breeding events, with a focus on medium to large breeding colonies. Adopting methods developed by the ACT SPMRP, data collection will include Superb Parrot abundance surveys, flight path surveys, nest tree inspection surveys, and active nest searches. Where active nests are located, morphological measurements of the supporting nest tree and nest hollow will be collected. Where accessible, appropriately skilled tree climbers will measure and colour-band Superb Parrot nestlings (using approved protocols, see Section 10 – Item 4 & 5) to provide additional fitness, movement, and survival data.

In Year 1 and 2 of the SPCRP (2020-2021), the investigators will synthesise public Superb Parrot sightings and data from available independent monitoring programs within the species' range of occurrence to assess the contemporary conservation status of the Superb Parrot. Regional trend profiles will be generated for the Superb Parrot using linear/additive modelling techniques (e.g. GLMMs, GAMs). Results of trend elicitation will be disseminated to all relevant stakeholders at the earliest opportunity.

PROJECT C To assist strategic planning of Superb Parrot recovery actions under future climate change

Objectives:

- Critically examine evidence for the impact of climate change on the Superb Parrot
- Identify landscape features with a potential role in mitigating threat from climate change to the Superb Parrot
- Undertake species distribution modelling to identify potentially suitable breeding, foraging, and wintering habitat
- Provide recommendations for the protection of Superb Parrot habitats

Approach: Project C will be coordinated by the EPSDD Ecologist and supported by a Postdoctoral Fellow and Spatial Analyst skilled in species distribution modelling. Superb Parrot distribution data (compiled in Project B, and from the SPCRP; i.e. superb parrot breeding, foraging, wintering, and movement information) will be related to best available spatial information on weather variability, vegetation composition and extent, and fire history. Multi-variate analysis will be used to identify refugia for the species. Results of the analysis will contribute to a new Superb Parrot habitat protection and restoration strategy. The strategy will provide advice to land managers on where to advance specific activities (e.g. formal protection, planting for connectivity, hollow supplementation) for Superb Parrot conservation.

5. SIGNIFICANCE *Alignment of project aims with recovery plan objectives*

Objectives and actions listed in the National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (2011) that are addressed or advanced by the proposed Coppabella Wind Farm SPCRP research projects are summarised below.

PROJECT AIM	RECOVERY ACTIONS
<p>Project A To better understand local and regional movements of Superb Parrots</p>	<p>Objective 2: Increase the level of knowledge of the Superb Parrot’s ecological requirements.</p> <p>Action 2.2 Investigate the foraging ecology of Superb Parrots.</p> <p>Action 2.3 Identify and map [all] areas with high potential to be used for foraging during the breeding season, and areas used for foraging during the non-breeding season.</p> <p>Action 2.4 Identify and map potential flight corridors between breeding colonies and potential or known foraging areas, and corridors used in the non-breeding season.</p> <p>Objective 3: Develop and implement threat abatement strategies.</p> <p>Action 3.2 Identify... breeding season foraging habitat within 20 km of colonies</p> <p>Action 3.10 Identify... critical breaks in flight corridors.</p>
<p>Project B To update knowledge on the breeding ecology and conservation status of Superb Parrots</p>	<p>Objective 1: Determine population trends in the Superb Parrot.</p> <p>Action 1.1 ... survey for new nesting sites.</p> <p>Objective 2: Increase the level of knowledge of the Superb Parrot’s ecological requirements.</p> <p>Action 2.1 Survey woodlands on the NSW/ACT slopes... with high potential to support breeding colonies.</p> <p>Objective 3: Develop and implement threat abatement strategies.</p> <p>Action 3.2 Identify... breeding season foraging habitat within 20 km of colonies</p> <p>Action 3.12 buffer [around] all known nest trees and colonies... This should include both living and dead hollow bearing trees, and allow for the recruitment of such trees.</p>
<p>Project C To assist strategic planning of Superb Parrot recovery actions under future climate change</p>	<p>Objective 3: Develop and implement threat abatement strategies.</p> <p>Action 3.6 Encourage local Governments to include in their local environment plans the protection of known and potential Superb Parrot habitat.</p> <p>Action 3.7 resources management staff... are aware of Superb Parrot habitat within or near their region.</p> <p>Action 3.21 Ascertain the fire history of nest sites and foraging areas, and collate relevant information on the effects of fire on Superb Parrot habitat.</p> <p>Objective 4: Increase community involvement in and awareness of the Superb Parrot recovery program.</p> <p>Action 4.3 Provide information to Landcare groups and landholders concerning the need to link currently isolated and unavailable habitat, and to restore habitat.</p>

6. INVESTIGATORS

The Coppabella Wind Farm (hereafter **CWF**) SPCRP has been co-developed with the **National Superb Parrot Recovery Team**, in consultation with the NSW Biodiversity Conservation Division (NSW Government, formerly Office of Environment and Heritage) and the Department of Agriculture, Water and Environment (Australian Government, formerly Department of Environment and Energy). This SPCRP will be implemented as collaborative research by the Fenner School of Environment and Society (Australian National University; hereafter **ANU**), and the Environment, Planning and Sustainable Development Directorate (ACT Government; hereafter **EPSDD**).

For the last 4 years, the established ANU-EPSDD team have completed detailed population research on Superb Parrots in the ACT, with demonstrated experience in finding, monitoring and tracking Superb Parrots. The ANU-EPSDD ecologists are highly experienced in developing and implementing large-scale monitoring programs, including for threatened and mobile animals (e.g. Superb Parrot, Swift Parrot, Regent Honeyeater, Orange-bellied Parrot, Forty-spotted Pardalote, Eclectus Parrot, Palm Cockatoo, Eastern Bettong, Eastern Quoll, New Holland Mouse, Bush-stone Curlew). ANU researchers in the team developed many of the techniques necessary for locating and tracking nomadic birds at the broad scales proposed in the SPCRP (e.g. [DBRG website](#)). EPSDD has coordinated and funded the ACT SPMRP to deliver Superb Parrot conservation data to regional land managers and the community. As such, the ANU-EPSDD team bring substantial project management and specialised ecological expertise to Superb Parrot research projects. The ANU-EPSDD team is therefore uniquely placed to deliver the proposed SPCRP. Nominated roles for carrying out activities in the SPCRP are as follows:

ROLE	FUNCTION
ANU Professor: Adrian Manning – Superb Parrot Expert	SPCRP manager, Project designer, PhD supervisor (Chair)
EPSDD Senior Ecologist: Dr Laura Rayner – Monitoring Expert	SPCRP manager, Project leader (Project B), PhD supervisor
ANU Professor: Robert Heinsohn – Parrot Expert	PhD supervisor, Design support (Project A)
ANU Fellow: Dr Dejan Stojanovic – Tracking Expert	PhD supervisor, Technical support (Projects A & B)
ANU Program Support Officer: Ms Jenny Newport	Equipment manager, Administration support (Projects A & B)
ANU PhD Scholar: McLean Cobden	Movement ecologist, Project leader (Project A)
EPSDD Research Assistant (to be recruited)	Field officer, Monitoring support (Project B)
EPSDD Spatial Analyst (to be recruited)	Spatial modeler, Project leader (Project C)
ANU Postdoctoral Fellow	Data Analysis, Recovery Planning

The ANU-EPSDD team experts include:

Prof Adrian Manning (ANU) is an internationally recognised restoration ecologist and conservation biologist 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’s Superb Parrot expertise was developed in the South-west Slopes bioregion of NSW and he will contribute substantial regional knowledge, including local breeding data, to the SPCRP.

Dr Laura Rayner (EPSDD) is a conservation ecologist and an expert in the design, implementation, and evaluation of woodland bird monitoring programs. Dr Rayner has developed robust protocols for the collection of population data for the Superb Parrot and the critically endangered Regent Honeyeater. Dr Rayner will contribute her specialist experience in Superb Parrot monitoring and tracking to the SPCRP.

Prof Robert Heinsohn (ANU) is an internationally recognised conservation biologist and evolutionary ecologist, and a world-renowned parrot researcher. Prof Heinsohn’s work on the Eclectus Parrot and Palm Cockatoo has broken new ground in parrot research, and he currently leads large-scale conservation programs on the critically endangered Orange-bellied Parrot and Swift Parrot. Prof Heinsohn will contribute his specialist analytical techniques in population viability analysis and diverse experience in parrot survey techniques to the SPCRP.

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 experience in parrot biology, nest access, and avian tracking to the SPCRP.

Major contributions to ANU-EPSDD research are also made by Dr Michael Mulvaney (EPSDD), Dr Damon Oliver and Dr David Parker (NSW Government), Ms Jenny Newport (ANU), and Mr Chris Davey and Mr Stuart Harris (independent contractors).

7. TIMELINE, ROLES AND RESPONSIBILITIES

Below we provide an indicative timeline of activities, summarised by key performance indicators. The Senior Ecologist (EPSDD) will be responsible for data management, and SPCRP annual reporting and evaluation. Annual reports will be submitted directly to **CWF**, and must include progress on performance indicators, project expenditure, and recommendations for ongoing project implementation.

PROJECT A January 2021 – January 2024 (3 years)

Key performance indicator	Responsible party	Delivery date
Progress: Maps of Superb Parrot migratory flight paths	ANU	Annually: 31 May 2021 - 2023
Report: Modelling predicted Superb Parrot flight space	EPSDD-ANU	30 July 2024

Project B February 2021 – February 2025 (4 years)

Key performance indicator	Responsible party	Delivery date
Progress: Local breeding productivity and site fidelity assessment	EPSDD	Annually: 28 February 2022 – 2025
Report: Regional conservation status of Superb Parrot	EPSDD	31 August 2022

Project C January 2023 – June 2025 (2.5 years)

Key performance indicator	Responsible party	Delivery date
Progress: Superb Parrot species distribution model	EPSDD	31 August 2024
Report: Superb Parrot Recovery Strategy	EPSDD-ANU	30 June 2025

SP CRP January 2021 – June 2025 (4.5 years)

Key performance indicator	Responsible party	Delivery date
Meeting: Quarterly progress updates	ANU-EPSDD-CWF	28 Feb, 30 May, 31 Aug, 30 Nov 2021 – 2024
Report: Annual SPCRP project updates, including outcomes of review (Section 8)	ANU-EPSDD	Annually: 30 July 2021 – 2024
Review: Annual progress evaluation meeting	ANU-EPSDD-CWF	Annually: 30 June 2021 – 2024
Payment of annual funding deposits	CWF	Annually. Date for payment to be confirmed - noting first contribution to be made within 20 business days from the commencement of the action.
Submission of report to the Department	CWF	In accordance with the condition of EPBC Act Approval 2017/8129
Report: SPCRP evaluation report	EPSDD	30 June 2025

8. REVIEW

The SPCRP will be reviewed each year following the reporting period. This will include a program status update and will review how research findings to date relate to upcoming performance indicators and project objectives. As required, the plan will be updated/amended and a copy provided by **CWF** to the Minister responsible for administering the EPBC Act (in accordance with Condition 23-23C of the Approval).

9. BUDGET

CWF will provide at least \$100,000 each year for five years to fund the conservation research activities outlined in this SPCRP. The first year's contribution will be made within 20 business days from the **commencement of the action, and the subsequent year's contributions will be made prior to the subsequent anniversary of the commencement of the action.**

Below is a breakdown of the primary expenses associated with the proposed research. If this proposal is supported:

- BCD will contribute and maintain 9 ARGOS Pin-point Solar GPS transmitters valued at \$27,000;
- EPSDD will contribute and maintain 10 ECOTONE Alle-100 Local UHF GPS transmitters valued at \$17,000;
- EPSDD will contribute and maintain \$25,000 of new equipment, including remote cameras for nest surveillance; and
- ANU will facilitate the use of existing field equipment valued at \$18,600.

The PhD scholar (McLean Cobden, Project A) has secured their own Research Training Program (RTP) Scholarship as a pre-requisite of appointment. Data access charges for satellite transmitters will be dependent on the number of transmitters operational. Estimates here assume no animal welfare concerns, no transmitter failures, and multi-year transmitter functionality. Should any of these issues be encountered, the adaptive management approach described in Section 4 will be adopted to ensure the project budget is not exceeded.

ITEM	YEAR 1 2020-21	YEAR 2 2021-22	YEAR 3 2022-23	YEAR 4 2023-24	YEAR 5 2024-25	TOTAL
Salaries						
EPSDD Ecologist	\$39,567	\$42,940	\$43,793	\$20,280	\$49,947	\$196,375
ANU Postdoctoral Fellow					\$36,581	\$36,581
ANU Program Support Officer	\$5,683	\$11,593	\$11,825	\$8,443		\$37,544
EPSDD Research Assistant	\$39,769	\$23,393		\$30,856		\$94,018
EPSDD Spatial Analyst			\$24,050	\$30,856		\$54,907
					Subtotal	\$419,576
Data						
PTT satellite transmitter costs	\$6,080	\$10,800	\$10,800			\$27,680
					Subtotal	\$27,680
Travel						
Project mileage	\$2,720	\$1,360	\$1,020	\$1,768		\$6,868
Field accommodation	\$200	\$1,400	\$700	\$700		\$3,000
Field per diems	\$100	\$700	\$350	\$350		\$1,500
					Subtotal	\$11,368
Consumables						
Research support		\$600				\$600
Tracking materials	\$209					\$209
Field work consumables		\$400	\$498	\$109		\$1,007
					Subtotal	\$1,816
ANU overheads (30%)	\$1,705	\$3,478	\$3,547	\$2,533	\$10,974	\$22,237
EPSDD contingency (5%)	\$3,967	\$3,337	\$3,417	\$4,105	\$2,497	\$17,323
TOTAL	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000

10. SCHEDULE OF PAYMENTS

The amount payable by CWF to the relevant research team is outlined below.

NUMBER	ANU PAYMENT AMOUNT (EXCL. GST)	TERRITORY PAYMENT AMOUNT (EXCL. GST)	TOTAL
Payment 1 (2020/21)	\$16,697	\$83,303	\$100,000
Payment 2 (2021/22)	\$29,931	\$70,069	\$100,000
Payment 3 (2022/23)	\$28,242	\$71,758	\$100,000
Payment 4 (2023/24)	\$13,794	\$86,206	\$100,000
Payment 5 (2024/25)	\$47,555	\$52,444	\$100,000
TOTAL	\$136,219	\$363,781	\$500,000

11. RELATED LINKS

Coppabella Wind Farm Pty Ltd: Decision of approval of action (Commonwealth approval conditions: 2017/8129)

National Recovery Plan for the Superb Parrot *Polytelis swainsonii* (2011)

NSW Saving our Species: Superb Parrot Conservation Project

ACT Superb Parrot Monitoring and Research Program: Annual Report (2015)

ACT Superb Parrot Monitoring and Research Program: Annual Report (2016)

Difficult Bird Research Group website