

Superb Parrot Conservation Research Plan

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Superb Parrot Conservation Research Plan – Bango Wind Farm

This plan has been prepared on behalf of Bango 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.

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

2. PURPOSE *Commonwealth 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 Bango Wind Farm development (**referral number 2013/6810**) that occurs within the breeding range of the Superb Parrot, which are:

Condition	Reference
<p>13 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 SPCR 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 SPCR. The approved SPCR must be implemented.</p>	This Plan
<p>The SPCR must contribute to better understanding Superb Parrot habitat use and breeding ecology within the South-west Slopes of NSW Important Bird Area, with a focus on identification of key breeding sites, 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 SPCR must contain, but is not limited to, the following:</p> <ol style="list-style-type: none"> Conservation research activities consistent with the National Recovery Plan for the Superb Parrot <i>Polytelis swainsonii</i> (2011) or any subsequent revised version 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>14 The approval holder must provide at least \$100,000 each year for five years to fund the conservation research activities outlined in the SPCR. 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 Bango Wind Farm, we propose two 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 foraging locations across the range. By design, the birds will determine the range of Project A, but it is expected that much of the activity will occur within the **South-west Slopes of NSW Important Bird Area**. 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 regions identified as suitable future climate space for Superb Parrots (includes the South-west Slopes Important Bird Area) where conservation action, such as habitat restoration, will be vital for protecting the species in perpetuity. This data will inform a better understanding of **Superb Parrot** habitat use and breeding ecology within the **South-west Slopes of NSW Important Bird Area**, which will be reported on specifically.

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 *Understanding local and regional movements of Superb Parrots*

Objectives:

- Undertake aviary trial to determine long-range transmitter harness design for Superb Parrots
- 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: (i) design and implement an aviary trial of methods for the attachment of semi-permanent GPS transmitters on Superb Parrots; and (ii) deploy up to 15 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 Office of Environment and Heritage (NSW Government) and will be used for multi-year range-wide tracking of Superb Parrots between wintering and breeding habitat. To enhance the welfare of wild Superb Parrots throughout the life of Project A, the aviary trial will continue until a safe and ethical method for transmitter attachment is demonstrated. Initial transmitter harness design will be adopted from recent transmitter applications to the Regent Parrot *Polytelis anthopeplus* in collaboration with the Department of Environment and Water (Government of South Australia). 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 approved protocols developed by the ACT Superb Parrot Monitoring and Research Program (**ACT SPMRP**; 2015 – present).

PROJECT B *Understanding the breeding ecology and conservation status of Superb Parrots*

Objectives:

- Locate breeding Superb Parrots in the South-west Slopes Important Bird Area
- Identify and describe nesting resources in the South-west Slopes Important Bird Area

Approach: Project B will be coordinated by an EPSDD Ecologist and supported by a Field Officer. From September to February, Project B will aim to locate and undertake monitoring at Superb Parrot breeding colonies in the South-west Slopes Important Bird Area. 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.

From March to August, the Ecologist will be responsible for data management, and SPCRP evaluation and reporting. Detailed annual reports for Projects A and B (separately) will be the minimum reporting requirement associated with the SPCRP. Annual reports will be submitted directly to the approval holder, and must include progress on performance indicators, project expenditure, and any amendments or recommendations for ongoing project implementation.

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 Bango 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. Action 2.2 Investigate the foraging ecology of Superb Parrots. 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. 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. Action 3.2 Identify... breeding season foraging habitat within 20 km of colonies 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. Action 1.1 ... survey for new nesting sites.</p> <p>Objective 2: Increase the level of knowledge of the Superb Parrot's ecological requirements. 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. Action 3.2 Identify... breeding season foraging habitat within 20 km of colonies 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>

6. INVESTIGATORS *Personnel, roles, and functions*

The Bango Wind Farm (hereafter **BWF**) SPCRP has been co-developed with the **National Superb Parrot Recovery Team**, and 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 and team members 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 Ecologist: Dr Laura Rayner – Monitoring Expert	SPCRP manager, Project leader (Project B), PhD supervisor
ANU Professor: Robert Heinsohn – Parrot Expert	PhD supervisor, Design support (Projects A)
ANU Fellow: Dr Dejan Stojanovic – Tracking Expert	PhD supervisor, Technical support (Projects A & B)
ANU Research Assistant: Ms Jenny Newport	Equipment manager, Administration support (Projects A & B)
ANU PhD Scholar (to be recruited)	Movement ecologist, Project leader (Project A)
EPSDD Research Assistant (to be recruited)	Field officer, Tracking and monitoring support (Projects A & B)

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 *Milestones, KPIs, and deliverables*

Below we provide an indicative timeline of activities, summarised by key performance indicators.

PROJECT A July 2019 – June 2024 (5 years)

Key performance indicator	Responsible party	Delivery date
Report: Aviary trial of transmitter attachment to Superb Parrots	EPSDD	30 June 2020
Product: Maps of Superb Parrot migratory flight paths	ANU	Annually: 30 May 2021 - 2023
Progress: Model of predicted Superb Parrot flight space	ANU	30 March 2024

Project B July 2020 – June 2024 (4 years)

Key performance indicator	Responsible party	Delivery date
Progress: Local breeding productivity and site fidelity assessment	EPSDD	Annually: May 2020 – 2024

SP CRP July 2019 – June 2024 (5 years)

Key performance indicator	Responsible party	Delivery date
Meeting: Quarterly progress updates	ANU-EPSDD-BWF	28 Feb, 30 May, 30 Aug, 30 Nov 2019 – 2024
Report: Annual SPCRP project updates, including outcomes of review (Section 8)	EPSDD	Annually: 30 July 2020 – 2024
Review: Annual progress evaluation meeting	ANU-EPSDD-BWF	Annually: 30 June 2020 – 2024
Payment of annual funding deposits	BWF	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	BWF	In accordance with the condition of EPBC Act Approval 2013/6810
Report: Project A and Project B SPCRP evaluation report (Year 5)	EPSDD	30 June 2024

8. REVIEW *Supporting an adaptive research plan*

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 KPIs and project objectives. As required, the plan will be updated/amended, and a copy provided by Bango Wind Farm to the Minister responsible for administering the EPBC Act.

9. BUDGET *Annual expenditure and payment schedule*

Below is a breakdown of the primary expenses associated with the implementation of the SPCRP:

- ANU will contribute the time of Prof Heinsohn and Dr Stojanovic for five years, equivalent to \$193,000 in salary costs;
- OEH will contribute and maintain 15 ARGOS Pin-point Solar GPS transmitters valued at \$45,000;
- EPSDD will contribute and maintain 10 ECOTONE Alle-100 Local UHF GPS transmitters valued at \$17,000;
- EPSDD will contribute and maintain \$50,000 of new equipment, including remote cameras for nest surveillance; and
- EPSDD will contribute a PhD top-up stipend of \$8,000 per year over three years to support Project A.

It is noted that the PhD scholar (Project A) will be required to secure 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 successfully deployed and 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. The purchase of a dedicated SPCRP field vehicle is included in the budget to save expenditure on vehicle hire over the life of the SPCRP. The SPCRP field vehicle will be made available for use by all SPCRP investigators, but primarily the PhD student (Project A).

ITEM	YEAR 1 2019-20	YEAR 2 2020-21	YEAR 3 2021-22	YEAR 4 2022-23	YEAR 5 2023-24	TOTAL
Salaries						
ANU Professor	\$5,826	\$4,754	\$24,245	\$19,784	\$9,081	\$63,690
EPSDD Ecologist		\$39,567	\$29,786	\$30,063	\$61,713	\$161,128
ANU Research Officer			\$11,593	\$11,825	\$15,680	\$39,098
ANU/EPSDD Field Officer	\$29,905	\$17,044				\$46,949
subtotal						\$310,864
Data						
PTT satellite data access	\$2,400	\$18,000	\$13,200	\$13,200		\$46,800
subtotal						\$46,800
Travel						
SPCRP project vehicle (ANU)	\$43,004	\$300				\$43,304
Project mileage	\$7,100	\$3,400	\$5,440	\$7,140	\$1,632	\$24,712
Field accommodation		\$4,000	\$1,400	\$1,400	\$420	\$7,220
Field per diems		\$2,000	\$700	\$700	\$210	\$3,610
subtotal						\$78,846
Consumables						
Research support		\$1,000	\$400	\$2,500		\$3,900
Consumables	\$1,046	\$5,432	\$996	\$2,288	\$715	\$10,477
subtotal						\$14,377
ANU overheads (30%)	\$10,719	\$1,426	\$10,751	\$9,483	\$7,428	\$39,808
EPSDD contingency (5%)		\$3,077	\$1,489	\$1,618	\$3,121	\$9,305
TOTAL	\$100,000	\$100,000	\$100,000	\$100,000	\$100,000	\$500,000

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

NUMBER	ANU PAYMENT AMOUNT (EXCL. GST)	EPSDD PAYMENT AMOUNT (EXCL. GST)	TOTAL
Payment 1 (2019/20)	\$100,000	Nil	\$100,000
Payment 2 (2020/21)	\$35,380	\$64,620	\$100,000
Payment 3 (2021/22)	\$68,725	\$31,274	\$100,000
Payment 4 (2022/23)	\$66,031	\$33,969	\$100,000
Payment 5 (2023/24)	\$34,451	\$65,549	\$100,000
TOTAL	\$304,587	\$195,413	\$500,000

10. RELATED LINKS *Further reading and reference materials*

[Bango Wind Farm Pty Ltd: Decision of approval of action \(Commonwealth approval conditions: 2013/6810\)](#)

[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](#)