Science for Saving Species

Research findings factsheet

Project 2.2.1

Threatened Species Recovery Hub

National Environmental Science Programme

Saving the orange-bellied parrot

Part 3: New targeted interventions required in migration/wintering habitats

In brief

The orange-bellied parrot is one of Australia's most imperilled species. We investigated the need for new interventions to prevent extinction, examining whether conservation actions at the breeding grounds in Melaleuca, Tasmania, are effective at reducing mortality over migration and winter. We used a population model to estimate annual survival of orange-bellied parrots to look at whether survival was constant or varied between juveniles and adults, year and time period. Data for 797 orange-bellied parrots hatched between 1995 and 2017 showed that 522 birds (65%) died in the first year of life and 275 birds (35%) died in the second year of life or later, with mean lifespan 1.76 years. This revealed that survival is age-related in orange-bellied parrots, with juvenile survival more than halving over the study period. This suggests that interventions in the breeding grounds are not sufficient to recover the species unless additional efforts elsewhere are implemented as well. Targeted efforts to protect orange-bellied parrots in their migration and winter habitats may be needed.

Main aim of research

We examined whether the key conservation actions implemented at the breeding grounds (Melaleuca, Tasmania) are effective at reducing mortality over migration and winter.

Background

The orange-bellied parrot is one of Australia's most threatened species. The parrot is migratory, breeding at a small single site at Melaleuca, Tasmania in summer, and migrating to coastal regions of south-eastern Australia in winter.

The orange-bellied parrot has been a cause of conservation concern since the 1970s. It was the first threatened species in Australia to have a recovery team (formed in 1983), recovery plan (prepared in 1984) and emergency plan (prepared in 2010). An insurance population was established in captivity in 1985. The orange-bellied parrot is subject to intensive conservation management, because the wild population is perilously small, with recent population sizes falling below 50 mature individuals. There is low survival of adult females and juveniles of both sexes, and a high reliance on supplementation from the captive population to prevent imminent extinction in the wild.

Recovery actions for the orange-bellied parrot have a spatial bias, with most efforts directed towards the breeding range in Melaleuca, Tasmania.

Previous research has highlighted the population dynamics of this rare and dispersed species includes many uncertainties and that survival of orange-bellied parrots during winter was more important than their reproductive success in summer.

Other research conducted by our team has highlighted the importance of vegetation composition in managing habitats for the species. Management actions which are likely to increase chance of survival in the wintering habitat include the control of predators, decreasing human disturbance, management of sheep grazing and food quality.

Male orange-bellied parrot. Image: JJ Harrison CC BY-SA 3.0 wikimedia commons

Key findings

We collated data for 797 orange-bellied parrots hatched between 1995 and 2017 and found that:

- 522 birds (65%) died in their first year of life
- 275 birds (35%) died in their second year of life or later
- Based on the collated data, the mean lifespan is 1.76 years.

Australian National University

Charles Sturt University

The University of Sydney

Tasmanian Government

Cited material

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What we did

We modelled annual survival data collected by an orange-bellied parrot citizen science monitoring program between 1995 and 2017, to evaluate the efficacy of recovery actions over two decades. Annual survival is a useful demographic trait to study, because it is the outcome of multiple, cumulative and discrete threats over the full annual cycle.

We accounted for potential misidentification errors by filtering the data to include verified and reliable sightings.

As the species now probably breeds only at Melaleuca, Tasmania, we assumed that this was a closed population, and that loss of individuals was due to death, not dispersal to other breeding locations. We constructed capture histories from 1995 to 2017.

During this period, any nestlings were banded and this was the main way marked birds entered the population.

We used survival models to estimate annual survival rates of orange-bellied parrots, and explored whether the survival component was constant, or varied with age class (juveniles/adults), year and time period.

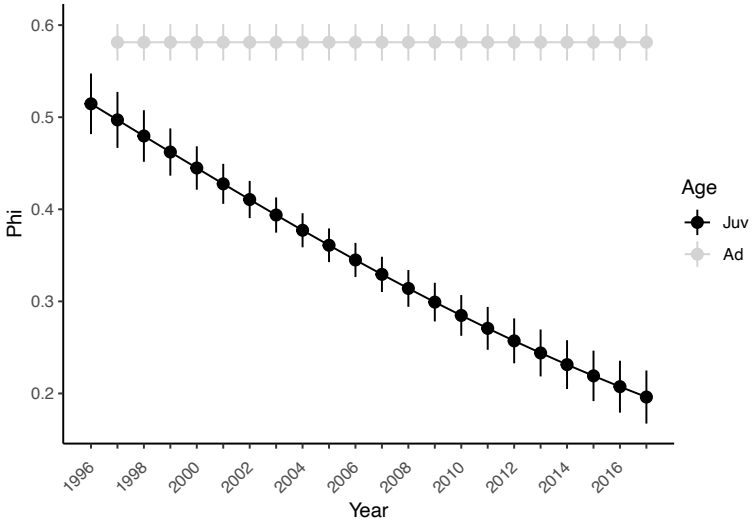

Figure 1: *Modelled estimates of survival probabilities (Phi(φ) mean ± se) of juvenile (juv) and adult (ad) orange-bellied parrots at their last known breeding ground at Melaleuca, Tasmania. Over the entire study, conservation interventions were implemented at the breeding ground, but these actions did not improve the survival of juveniles.*

Further Information

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Implications

Survival was age-related in orange-bellied parrots, and juvenile survival more than halved over the study period. The results reveal a chronic decline of annual survival rates for juveniles, despite intensive conservation efforts at the breeding ground (Melaleuca, Tasmania).

These results supports the prediction that interventions in the breeding ground alone are not enough to recover this species, and suggest that targeted efforts to protect orange-bellied parrots in their migration/winter habitats are needed.

There are two possible explanations for the results:

1. the interventions undertaken in Tasmania do not address the primary threats in the breeding ground; or
2. the interventions do mitigate threats in the breeding ground, but mortality during migration/winter nullifies the benefits.

Testing these hypotheses is crucial because this information will clarify the aspects of life history (breeding, migration, wintering) that should be targeted with new interventions.

The migration/winter life history phase poses substantial logistical challenges, and identifying where and when to act is difficult.

Management actions should:

- be targeted at locations where the species aggregates (at key staging sites for migration and key wintering areas)
- be prioritised at places that achieve short term goals (e.g. food availability immediately) and long term goals (e.g. habitat restoration).

This project also addressed major gaps in knowledge about 1) habitat suitability and management for the wild population; and 2) traits of the captive population and conservation implications, the findings of which are presented in separate factsheets.

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