



Critically endangered orange-bellied parrot



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Monitoring and Reporting System for Tasmania's National Parks and Reserves

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MONITORING AND REPORTING SYSTEM FOR TASMANIA'S NATIONAL PARKS AND RESERVES

EVALUATED CASE STUDY REPORT	
PERFORMANCE ARENA:	2. CONDITION OF RESERVES AND RESERVE VALUES
Key Performance Area:	2.4 Condition of ecosystems and natural diversity
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Cover photo (main image): The critically endangered orange-bellied parrot. (Photo: Jan Wegner)

Smaller images (L to R): Breeding habitat of the orange-bellied parrot at Melaleuca; volunteer Karen Alexander assists the recovery effort by cleaning the feeding tables at Melaleuca which helps reduce the risk of disease spreading; orange-bellied parrots at DPIPWE's captive breeding facility at Taroona, Hobart. (Photos: DPIPWE).

Evaluation report: Critically endangered orange-bellied parrot

This report examines the effectiveness of management for the critically endangered orange-bellied parrot in the Tasmanian Wilderness World Heritage Area—the sole remaining breeding site for this species in the wild. The evaluation concludes that while significant progress has been made in establishing a captive insurance population and implementing a variety of actions to support the species in the wild, the total wild population of orange-bellied parrots has declined over the management period. The total wild population is now estimated to be fewer than 70 individuals. There are grave concerns for the persistence of this species in the wild.

Introduction

Orange-bellied parrots are small, colourful grass parrots and an iconic species for the Tasmanian Wilderness World Heritage Area (TWWHA). The orange-bellied parrot (*Neophema chrysogaster*) is one of the world's most threatened species. It is listed under the Australian *Environment Protection and Biodiversity Conservation Act 1999* as critically endangered, as a 'migratory species' and as a 'marine species' (because it migrates over a marine area). The parrot is listed as endangered under the Tasmanian *Threatened Species Protection Act 1995*, and is also listed as threatened under state legislation in South Australia, New South Wales and Victoria.

About the value

Orange-bellied parrots are a significant natural value of the TWWHA.

In appearance, they are relatively small parrots with emerald green back and wings, azure blue markings on their wings and brow, and a distinctive bright orange patch on their belly. The birds feed almost exclusively on seeds and fruits (Brown and Wilson 1984) and have an average life expectancy of less than three years (Holdsworth 2006).

Orange-bellied parrots are a migratory species, and the adults migrate before the juvenile birds. Each autumn, the birds fly north from Tasmania to coastal areas in South Australia and Victoria (formerly also to New South Wales) where they over-winter. They typically arrive back in Tasmania in spring for the summer breeding season.

Orange-bellied parrots now only breed in far southwest Tasmania, within particular vegetation types located close to the coast, within the TWWHA. Their preferred breeding habitat is a mosaic of eucalypt forest, rainforest and buttongrass moorland that has been burnt in the previous few years (Orange-bellied Parrot Recovery



The orange-bellied parrot (*Neophema chrysogaster*) is the world's most endangered parrot still living in the wild.

Photo: Dave Watts

Team 2006a, Holdsworth 2006, Brown and Wilson 1982, Brown and Wilson 1984). It is not known how much habitat in the breeding range is required to support a viable wild population of orange-bellied parrots.

Nesting occurs in the hollows of mature eucalypt trees (typically *Eucalyptus nitida*) and—in recent years—in artificial nestboxes provided at Melaleuca. Nests are occupied from mid-November through the summer months. Females lay between one and six eggs (average 4.7, Holdsworth 2006). The eggs hatch after a 21 day incubation period and the young are fed by both parents. The birds fledge at four to five weeks of age. The birds depart on their northern migration between February and April.



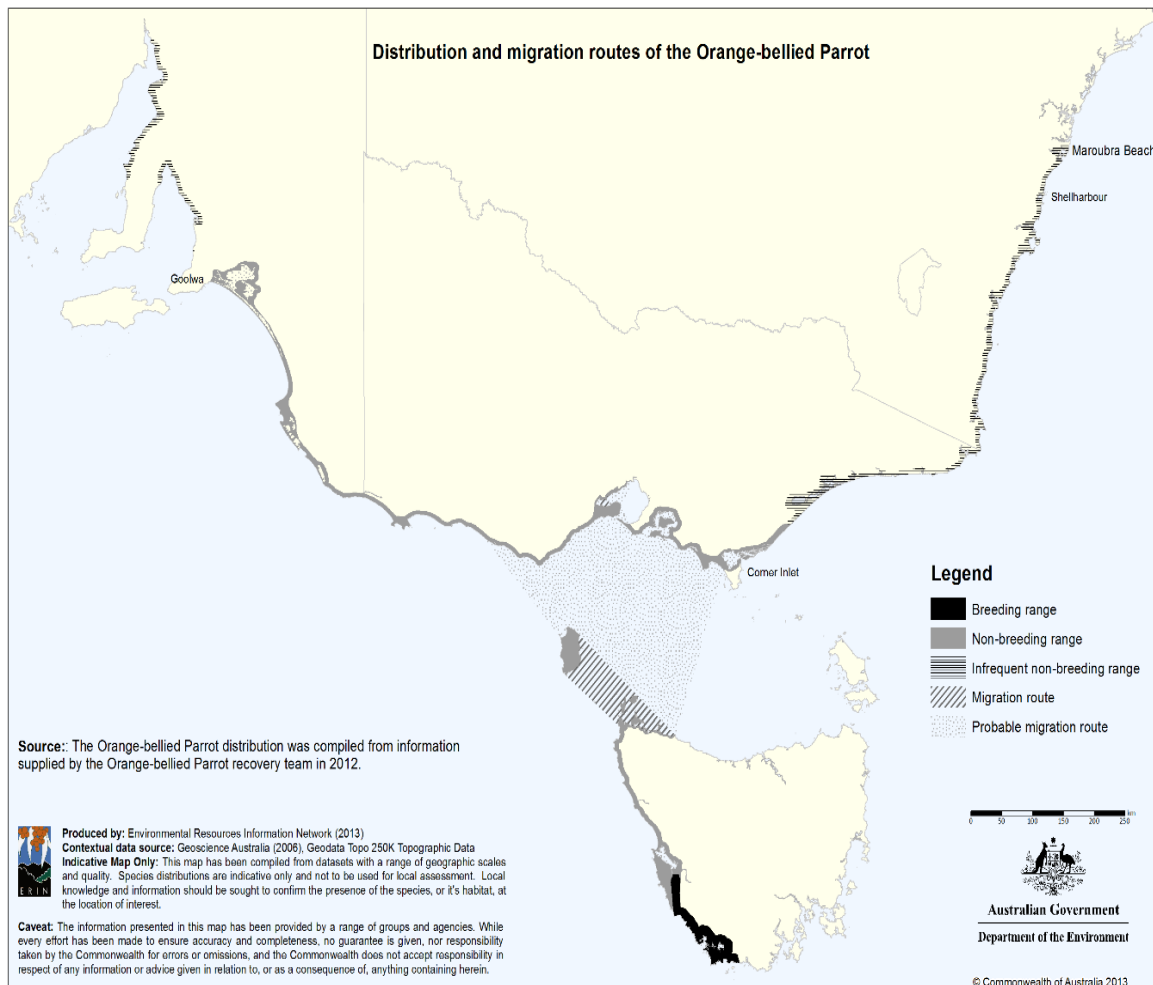
Orange-bellied parrots now breed only at Melaleuca in the Tasmanian Wilderness World Heritage Area. They nest in the hollows (and artificial nestboxes) of Eucalypt trees that occur in forest patches in a mosaic with buttongrass moorland.

Photo: Simon de Salis

History of decline

Orange-bellied parrots were once widespread and abundant in south-eastern Australia. However, the range and abundance of the species has progressively declined over the past century. Although information is limited, it is known that during the late 1800s to 1920s, orange-bellied parrots were recorded as ranging in winter from the Yorke Peninsula in South Australia through Geelong on the south coast of Victoria, and up the east coast to Sydney, NSW. Figure 1 shows the full extent of the previous range, describing it as ‘infrequent non-breeding range’ and ‘non-breeding range’.

During the 1970s, the total wild population of orange-bellied parrots was estimated to be fewer than 200 individuals (Olsen 2013). By the 1990s, the wild population had declined to around 100 individuals (Orange-bellied Parrot Recovery Team 2006a, Olsen 2013). There may have been another significant decline in the early 1990s where approximately 25% of genetic variation was lost (R. Coleman and A. Weeks unpubl. data in Department of Environment, Land, Water and Planning (DELWP) 2016).



(Source: Environment Resources Information Network, 2013)

The breeding range of orange-bellied parrots used to extend along the western and southern coast of Tasmania, east to the Southport region (North, 1912) and inland 100km (Brown and Wilson, 1984). The breeding range initially contracted to south-west Tasmania, from Birchs Inlet in the north to Louisa Plains in the south (Figure 2). During the last 40 years, the breeding range contracted further to only two known breeding sites—at Birchs Inlet and Melaleuca Lagoon. The natural breeding population disappeared from Birchs Inlet in 1985 (Orange-bellied Parrot Recovery Team, 1998) and breeding records are now limited to within 10km of Melaleuca Lagoon (DELWP 2016).

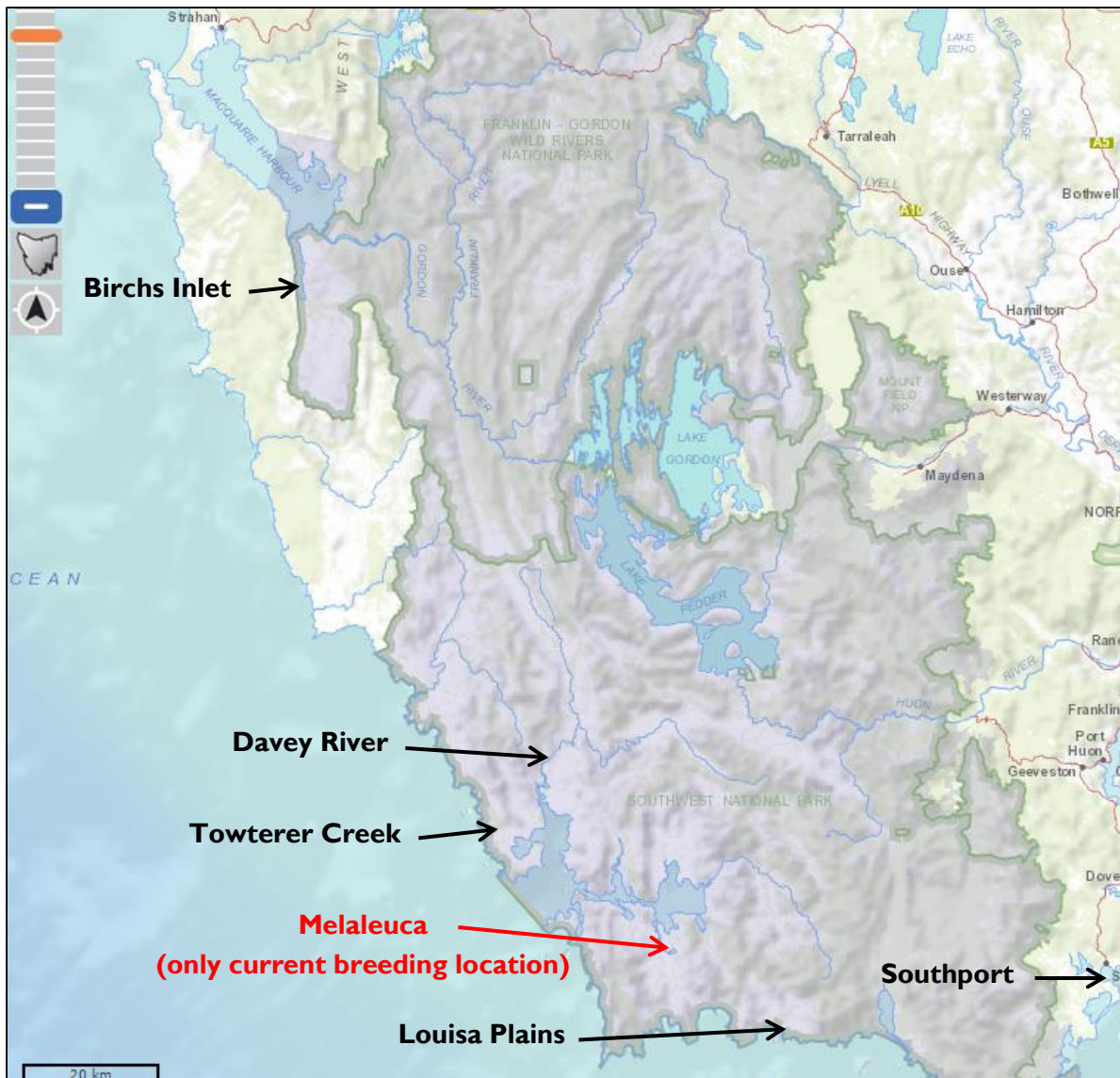


Figure 2. Current and previous significant locations for orange-bellied parrot breeding in south-west Tasmania (basemap from the Land Information System Tasmania, www.thelist.tas.gov.au).

Factors affecting the species

The reasons for the decline in orange-bellied parrot population are not clear. Past and ongoing habitat loss and degradation, particularly in the migration range in northwest Tasmania and the Bass Strait islands, and the over-wintering range in southeastern mainland Australia, is believed to be one of the greatest threats to the birds (www.dpipwe.tas.gov.au/obp). Most of the mortalities of orange-bellied parrots occur outside the breeding season (and, therefore, outside the TWWHA) and the causes of mortality are usually unknown (DELWP, 2016). In most years, only 40-50% of the birds that migrated north from Melaleuca returned to breed (unpublished summary, March 2016 meeting of National Recovery Team). However, there are many threats to the species, both within the over-wintering range and also in the breeding range at Melaleuca. Table 1 sets out the known threats to the recovery of orange-bellied parrots with their risk rating, with additional notes on threats provided below.

Table 1. Known and potential threats to the recovery of orange-bellied parrots with risk rating (Source: DELWP 2016)

Threat	Cause	Evidence for impact	Risk Rating
Degradation and loss of habitat	Development and land use change	Strong	Very High
	Inappropriate hydrological regimes	Strong	Very High
	Inappropriate grazing regimes	Weak	Moderate
	Inappropriate fire regimes	Moderate	Very High
	Invasive weeds	Strong	Very High
	Disturbance from human activities	Moderate	Moderate
Loss of genetic diversity and inbreeding		Strong	Very High
Disease		Moderate	High
Stochastic environmental events		Moderate	Very High
Climate change		Moderate	Very High
Predators and competitors		Moderate	Very High
Barriers to migration and movement		Weak	Moderate
Consumption of toxic food plants		Weak	Low
Hybridisation with blue-winged parrots		Weak	Low
Negative effects of management activities		Moderate	Moderate

Additional notes on threats

Disturbance from human activities is most common in developed and accessible areas of the non-breeding range, 'although visitors at the Melaleuca breeding location also have the potential to disturb natural behaviours... Orange-bellied parrots are known to be sensitive to noise disturbance, and will interrupt feeding and flush to cover in response to noise from humans, vehicles and light aircraft including helicopters' (Bezuijen *et al* 2000, Quin & McMahon 2001, but see Bezuijen & Lane 1997). It is unknown what frequency of disturbance will create energetic stress for birds or lead to abandonment of a site' (DEWNR 2016; 12).

Invasive weeds such as marram grass and sea spurge displace the saltmarsh plants upon which the birds feed in winter.

The disease most relevant to orange-bellied parrots is Psittacine Beak and Feather Disease. This disease occurs naturally in wild parrot populations and is transmitted between species. It is likely to increase the mortality of chicks.

Stochastic events that threaten the species include storms when the birds are migrating across Bass Strait, and drought, which influences the quality and availability of food. The frequency of these events, and the distribution of habitat and pest species, is influenced by climate change.

Predators include cats and foxes; competitors for nestboxes include tree martins and starlings.

Barriers to migration include coastal development and may include windfarms (www.dpipwe.tas.gov.au/obp , DELWP, 2016).

The significance of all the above threats is increased due to the small number of birds remaining in the wild.

Background to management

The focus of this report is on management performance over the term of the current statutory management plan for the TWWHA (Parks and Wildlife Service, 1999) which covers the period from 1999 to the time of writing (July 2016). The section below summarises management efforts prior to 1999.

Monitoring of the population of orange-bellied parrots at Melaleuca commenced in 1979 and has been conducted annually since 1992 (Threatened Species Scientific Advisory Committee, 2006). The monitoring has been done by State Government staff and volunteers. Monitoring is conducted through recording uniquely coded leg bands and examining nest contents. Counts of orange-bellied parrots on the Australian mainland during the winter months have been conducted annually since the early 1980s (e.g. Orange-bellied Parrot Recovery Team, 2006a).

In 1981, a captive orange-bellied parrot breeding program was established in Hobart, with the aims of establishing an insurance population and providing birds for release to bolster the wild population (Hogg, Hockey and Murray, 2014). The founding population was established through the capture of 10 wild birds.

The National Orange-bellied Parrot Recovery Team was formed in 1983. The team has produced several Recovery Plans since 1984 with recent Plans listing recovery actions to be undertaken related to specific recovery objectives, their priority, performance criteria and the Agencies responsible. DPIPWE's early responses to the Recovery Plan included providing supplementary feeding at Melaleuca (since 1988) and installation of nestboxes at Melaleuca and Birchs Inlet in 1992, to increase the availability of breeding sites and also enable researchers to access nests for banding and monitoring. Annual observations have been undertaken at Melaleuca since 1992 to determine the variety of nestbox competitors, and since 1993/94, to document the survival and breeding productivity of orange-bellied parrots (as determined by counting fledglings).

Since the early 1990s, there have been ongoing efforts to increase the wild bird population by releasing captive-bred individuals. In 1991, 11 captive bred birds were released at Melaleuca and a further 14 birds were released in 1992/3. Small numbers of these birds successfully bred and returned to the site the following season. Further releases during the management period are described below.

Overall management goal

Drawing on the national Orange-bellied Parrot Recovery Plan, the overall goal for this program in relation to management of the Tasmanian Wilderness World Heritage Area is:

- A wild population of the orange-bellied parrot that, with limited species-specific management, has a high likelihood of persistence in nature.

Associated key desired outcomes include:

- (i) A stable¹ or increasing population in the wild.
- (ii) Increased capacity of the captive population to support future releases of captive-bred birds to the wild and provide a secure long-term insurance population.
- (iii) Habitat for orange-bellied parrots protected and enhanced to maintain and support an increase in the wild population.

¹ The term 'stable' is used in the Recovery Plan to mean 'not demonstrably declining', and does not imply that the population is resilient or secure. The term is used to reflect the circumstance where the decline appears to have halted (DEWLP 2016: 23). The Recovery Plan also sets out that even if zero birds are detected in the wild for two years, recovery efforts will continue, but focus on release of further captive-bred birds into managed habitat.

Management actions and significant events

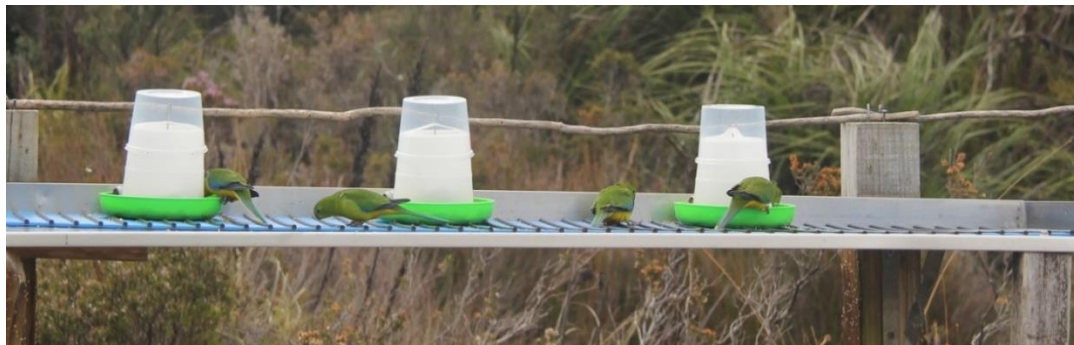
The fundamental strategy for achieving the management goal is threefold: (a) maintain habitat and manage threats to support the wild population; (b) augment the wild population with captive-bred birds; and (c) maintain a captive population as insurance against catastrophic loss of the wild population.

Over the management period since 1999, management activities and significant events related to orange bellied parrots in Tasmania included:

- Since 1999 – Provision and maintenance of nestboxes, supplementary feeding and monitoring of breeding productivity at Melaleuca. Nestboxes are attached to trees in the vicinity of Melaleuca. Birds are banded for identification where possible.
- Since 1999 – Annual counting and observations of orange-bellied parrot breeding population at Melaleuca (and also parts of the over-wintering population on Australian mainland). Monitoring undertaken by Wildcare/ DPIPWE volunteers and DPIPWE staff, for six to seven months a year. Some volunteers have been returning to Melaleuca annually for over a decade. Birdlife Australia volunteers and state departments of environment staff have undertaken observations in known over-wintering habitat in Victoria and South Australia.
- Opportunistically since 1999 and systematically since 2013 – observations of competitors and predators at breeding sites, and control of predator numbers as required (for example following reports of predators harassing and/or waiting outside nestboxes containing nestlings about to fledge). Nestbox design has been modified over the management period to preclude larger predators and competitors from entering the boxes.
- In early 2000s – common (European) starlings are considered significant competitors for nest sites and their numbers were controlled at both Melaleuca and Birchs Inlet.
- Each year from 1999 to 2009 – captive-bred birds released at Birchs Inlet in an attempt to re-establish a breeding population at this former breeding site. A total of 429 birds were released. Seasonal survival and bird returns were monitored.
- 2004 – The performance of management for orange-bellied parrots in the TWWHA was reported in the *State of the TWWHA Report No. 1* (PWS 2004:151-153).
- 2006 – Species uplisted under the *Environment Protection and Biodiversity Conservation Act 1999* from 'endangered' to 'critically endangered'.
- March 2010 – On the basis of population data, the Orange-bellied Parrot Recovery Team concluded that the species was likely to become extinct in the wild within three to five years (Garnett, Szabo and Dutson 2011).
- April 2010 – Emergency action plan approved and funded. Plan aimed to increase the size of the wild population through habitat management (supplementary feeding, active fire management, protection of nests from competitors and predators, securing known winter habitat from predators and competitors), releasing captive-bred birds at Melaleuca, and increasing the size and genetic diversity of the captive population (Garnett, Szabo and Dutson 2011).
- November 2010 – Parks and Wildlife Service Reserve Activity Assessment (RAA) documentation prepared for proposed Needwonnee Aboriginal Walk to be constructed at Melaleuca. The RAA concluded that a 'do nothing' option was not acceptable as an Aboriginal interpretive walk at Melaleuca had been a commitment made by the Agency and Aboriginal community. The selected route was chosen out of four options considered (see Figure 3).
- December 2010 – Comments received from natural values specialists within DPIPWE on the Needwonnee Walk RAA noted that 'without adequate mitigation, the proposal has the potential to increase disturbance within an area critical for the orange-bellied parrot' and that the impact on the species 'could be significant'. The recommended mitigation strategy involved moving the

feeding table and bird hide to another location outside the Melaleuca Visitor Services Site² and also patch burning a new area to enhance orange-bellied parrot habitat.

- 2010/11 summer – 21 fledglings taken from wild population and introduced into captive population to increase genetic diversity.
- 2011 (or possibly 2012) – new bird hide and two feed tables constructed and sited in new location, with the aim of relocating the focus of orange-bellied parrot activity further away from the airstrip and the Visitor Services Zone at Melaleuca (see Figure 3). Pre-existing nest boxes were not moved, but additional nest boxes were constructed and installed near the new feed tables. The proposed patch burn was not conducted.



One of the new feeding tables at Melaleuca where birdseed is provided to supplement the natural food supply available to orange-bellied parrots with the aim of supporting enhanced breeding success.

Photo: DPIPWVE

- 2011/12 – Victorian Department of Environment and Primary Industries conducted an extensive review of the Orange-bellied Parrot National Recovery Plan to identify strengths, areas for improvement and priorities for the recovery program (Pritchard 2014).
- 2011-2016 – Orange-bellied parrot nestlings at Melaleuca tested for the virus that causes Psittacine Beak and Feather Disease (Pbfd).
- November 2013 – Release of 24 captive bred birds at Melaleuca, making use of constructed aviary on-site and staged releases of birds to dampen their initial dispersal, with the aim of increasing the ability of the captive birds to survive and breed successfully in the wild.
- 2014 – Protocol for disease and biosecurity management of orange-bellied parrots developed (DPIPWE 2015). Protocol requires daily cleaning and disinfection of feed tables during the breeding season and removal/refurbishment of nest boxes once they have been occupied, to reduce transmission of the Pbfd virus.
- September 2014 – Second release aviary constructed at Melaleuca, to allow staged, 'soft release' of captive-bred birds.
- September 2014 – Commencement of installation of revised nestbox design with removable inner sleeve that improves ease of cleaning, with the aim of minimising spread of Pbfd. Installation of data loggers in nestboxes to allow comparison of former and new nestbox temperature and humidity.
- November 2014 – 27 captive-bred birds released at Melaleuca, again using release methods specifically aimed at dampening dispersal following release from aviaries.
- December 2014 and December 2015 – video recordings made of bird behaviour in response to helicopter activities at Melaleuca. Analyses currently underway (June 2016).
- Summer 2014/15 and 2015/16 – motion-activated cameras installed at nestboxes, the feeding tables and on captive release aviaries at Melaleuca, to monitor presence and activity of predators and competitors.

² Under the statutory management plan for the TWWHA, a variety of Visitor Services Zones and Sites are identified which are areas where the majority of visitor facilities are (or will be) provided and where the majority of visitors will experience the World Heritage Area (PWS 1999:59).

- 2015 – Development of DPIPWE management strategy for orange-bellied parrot competitors and predators.
- 2015 – Review commenced by DPIPWE Natural and Cultural Heritage Division of implementation of species fire management plan in relation to controlled burning of buttongrass plains around Melaleuca. Review due for completion in 2016.
- June 2015 – Federal Minister for the Environment, Greg Hunt, announced \$525,000 for emergency action for species recovery, ahead of the emergency intervention strategic response meeting held by Threatened Species Commissioner. This meeting was attended by the orange-bellied parrot recovery team, Birdlife Australia, Zoos Victoria, the National Environment Science Programme Threatened Species Recovery Hub, avian experts, disease specialists and the Tasmanian Government (media release, 12th June 2015).
- July 2015 – Orange-bellied parrot identified as a species requiring emergency intervention in the Australian Government [Threatened Species Strategy Action Plan 2015-16](#).
- September 2015 – Installation of newly designed nestboxes on poles at Melaleuca, south of the airstrip (and outside the Visitor Services Zone), with aim of providing additional nesting sites in close proximity to feed tables. Ten new boxes took the total number of nestboxes at Melaleuca to 92.
- September 2015 – Review of method of provision of supplementary feed (bird seed) to improve biosecurity.
- 2015 – Death of 14 birds at the Tarooma captive breeding facility as a result of rat predation. The affected birds were being quarantined because they had tested positive for the PBFD virus and were not part of the breeding program.
- September 2015 – An additional (third) feed table was provided at the Deny King Museum (former bird-hide, refer to Figure 3) to allow visitors to see the birds within the Visitor Services Zone, and to reduce risk of disturbance to birds using the other feed tables.
- November 2015 – Release of 13 captive-bred birds at Melaleuca.
- 2016 – Production of advocacy materials to increase program recognition; a postcard and brochure provide information on the Orange-bellied Parrot Tasmanian Program and details on how people can get more information, donate or become a volunteer.
- DPIPWE Orange-bellied Parrot Program website (<http://dpiuwe.tas.gov.au/obp>) launched.



Daily disinfection of the feeding tables is one of the hygiene measures undertaken to reduce the risk of disease transmission. Here, volunteer Karen Alexander assists the recovery effort by cleaning the feeding tables at Melaleuca.

Photo: DPIPWE




- Extent of Visitor Services Zone
-  Visitor facilities
- Private lease areas: no public access

Figure 3 Location of significant features at Melaleuca, south-west Tasmania (basemap from the Land Information System Tasmania, www.thelist.tas.gov.au).



A small cluster of low-key visitor facilities are located adjacent to Melaleuca Lagoon.

Photo: PWS

Monitored results for performance indicators

Table 2: Performance indicators and monitored results

Performance Indicators (and how they are monitored)	Targets and/or Limits (and how performance is assessed)	Monitored Results (detected over the management period)
CONDITION INDICATORS³		
I. Population size of orange-bellied parrots		
<i>Monitoring</i>	<i>Target</i>	<i>Results</i>
Number of orange-bellied parrots visiting feeding tables at Melaleuca.	A stable or increasing population in the wild	There were a minimum of 71 to 116 birds at Melaleuca over summer between 1994 and 2004 (Orange-bellied Parrot Recovery Team, 2006a). The population steeply declined between 2000 and 2008, by about 12% per year (Pritchard, 2014). The population then appeared to stabilise between 2009 and 2013 albeit at extremely low numbers of birds (18-25, DELWP, 2016). In 2014/15 there were 35 birds at the start of the season and in 2015/16 there were 23 birds at the start of the season (Troy and Gales, 2016).
Recorded number of captive-bred birds released into the wild and the number of captive-bred birds that survive that season. (DPIPWE staff and Wildcare volunteers undertake observations at Melaleuca throughout the breeding season and record data for the monitored parameters.)	<i>Assessment of performance</i> Analysis of time-series data	Twenty-four captive bred birds were released in 2013. Over 40% of the released birds survived the season (Troy and Gales, 2015). At the start of the 2014/15 season four birds that had been released in 2013 returned to Melaleuca. Another 27 captive bred birds were released in November 2014. Eighteen of these birds (67%) survived the season (Troy and Gales, 2015). At the start of the 2015/16 season, 2 birds that had been released in 2014 returned to Melaleuca. In November 2015 a further 13 captive-bred birds were released at Melaleuca. Eleven survived the season (85%) and are presumed to have migrated (Troy and Gales, 2016). From 2011 to 2016, between 31 and 67 orange-bellied parrots are estimated to have migrated north from Melaleuca at the end of the breeding season each year (Troy and Gales, 2016).
2. Demographic parameters		
<i>Monitoring</i>	<i>Target</i>	<i>Results</i>
Number of breeding pairs, female participation in breeding, number of eggs laid and number of fledglings that survive to be banded.	Increased rate of female participation and increased number of eggs laid, increased survival rates of chicks/fledglings	The number of breeding pairs of orange-bellied parrots at Melaleuca between 2010 and 2015 has varied between 7 and 18 pairs each season, see Table 3 . Analysis of data collected since 2000 shows that not all females breed in all years, with fewer than 50% of the females at Melaleuca showing signs of breeding activity in some years (DELWP, 2016).
Breeding success is measured by comparison of the number of eggs in nests with the	<i>Assessment of performance</i> Analysis of time-series	In 2010/11, 2011/12 and 2012/13 <i>all</i> females at

³ 'Condition indicators' relate to the condition of reserves or reserve values (e.g. natural or cultural resource assets and features).

Performance Indicators (and how they are monitored)	Targets and/or Limits (and how performance is assessed)	Monitored Results (detected over the management period)
number of fledglings banded. DPIPWE staff count total number of females in the population, number of occupied nestboxes and known nest sites, and the number of eggs laid. They then count and band juveniles.	data	<p>Melaleuca participated in breeding, which was the first time since participation data have been collected. In 2013/14, 73% of females that returned to Melaleuca participated (DELWP, 2016). In 2014/15, 64% of female birds participated in breeding (Troy and Gales, 2015). In 2015-16, 62% of female birds participated in breeding (Troy and Gales, 2016).</p> <p>Breeding success at Melaleuca has varied between 24% and 93% since 1993 (Troy and Gales, 2016). The long-term average is over 65% (from data in Troy and Gales, 2015). Overall breeding success in the wild is considerably higher than in the captive populations (in the 2014/15 season it was 34% at Taroona and 14% at Healsville - Troy and Gales, 2015).</p> <p>The number of fledglings produced each season has ranged between 14 and 39 since 2010 (Troy and Gales, 2016).</p>

PRESSURE INDICATORS⁴

3. Competitors and predators

<i>Monitoring</i>	<i>Target</i>	<i>Results</i>
Observation of predators and nest competitors at nestboxes	<p>An improved understanding of the role of competitors and predators, to inform specific management interventions</p> <p><i>Assessment of performance</i></p> <p>Results of observations at nestboxes and motion-sensor camera pictures</p>	<p>Tree martins (a native bird) are the most common competitor for orange-bellied parrot nestboxes.</p> <p>In 2015/16, as in previous years, tree martins occupied the highest proportion of nestboxes (68%). The proportion of nestboxes containing tree martins has varied from 25% to 68% since 1992/93. As more nestboxes have been provided, the number occupied by tree martins has increased (Troy and Gales, 2015) See Table 4.</p> <p>Checks on nestboxes conducted since 1992/93 indicate that starlings have used nestboxes intermittently since at least 1995/96. Common ringtail possums have occupied one nestbox in four seasons. Owlet nightjars occupied one box in three seasons. Green rosellas occupied one or two boxes in six seasons. Eastern pygmy possums and chocolate wattled bats occupied one nestbox in one and two seasons respectively.</p> <p>Observations also indicate that some nestboxes in some years also contain ants or honey bees (Troy and Gales, 2015).</p> <p>Black currawongs and snakes have been identified as potential nestbox predators. Sugar gliders were thought to have killed birds at Birchs Inlet (three</p>

⁴ 'Pressure indicators' relate to activities, processes and/or agents that are considered to pose a threat of degradation to reserves or reserve values (either directly or indirectly).

Performance Indicators (and how they are monitored)	Targets and/or Limits (and how performance is assessed)	Monitored Results (detected over the management period)
		<p>in 2004/5 and possibly another three since 1998/99). Sugar gliders have not been observed at Melaleuca.</p> <p>Camera monitoring of nestboxes at Melaleuca (established in 2014) has confirmed the above range of nestbox competitors (Troy and Gales, 2016).</p> <p>Observations of predators and competitors have been made at feed tables for the last three years. However, these data have not yet been analysed.</p>

4. Factors affecting bird health

Monitoring	Target	Results
Monitoring for the virus that causes Psittacine Beak and Feather Disease, by blood-testing of fledglings and some adults at Melaleuca	<p>No long-term impact on the population from factors affecting bird health</p> <p><i>Assessment of performance</i></p> <p>Results of blood testing for the virus that causes PBFD</p>	<p>Peters <i>et al</i> (2014) reported three confirmed PBFD virus cases in fledglings that were collected from Melaleuca in 2011.</p> <p>In the following 2011/12 breeding season, 11 nestlings were sampled and four (36%) tested positive. Of the 26 nestlings tested in 2014/15, 19 (73%) tested positive. Twenty-four birds were tested in 2015/16 and all were negative to the PBFD virus.</p>

OTHER INDICATORS (e.g. social or economic)

None identified.



This logo was one of the advocacy materials developed to increase program profile and recognition for the Orange-bellied Parrot Tasmanian Program.

Supporting evidence

Population size

Total wild population of orange-bellied parrots

The total wild population has not been consistently counted over time. Previous published accounts often did not specify whether the figure given for population was from the start or end of the breeding season and, therefore, whether it included juveniles. Some counts were for a single season and some were provided as the 'average' population size or the maximum population over a few years (refer to Figure 4).

Figure 4 below shows that the total wild population of orange-bellied parrots has declined from 'less than 200' in the 1980s and 1990s, to between 70 and 100 birds in the early 2000s, to around 20 individuals in the 2010s (until the reintroduction of the captive release program). This represents a potential population decline of 90% over perhaps only twenty years.

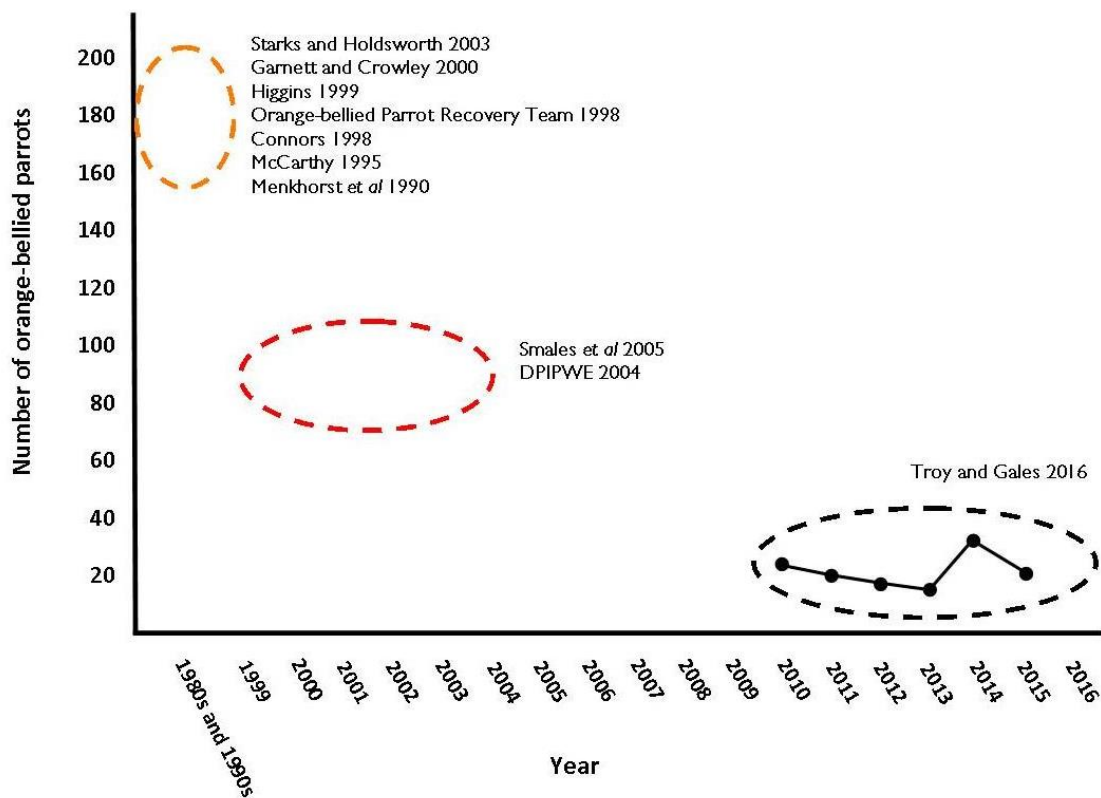


Figure 4 Change in orange-bellied parrot population for years where published data are available (after Table 1, Threatened Species Scientific Advisory Committee 2006 and Troy and Gales 2016).

Demographic parameters

In the last few years, census dates have been developed and definitions given to the population at the 'start of the season' and the population of adult and juvenile birds that survive the season and leave Melaleuca to migrate north. Also, a number of other demographic parameters are now consistently measured (Table 3). There is as yet no clear trend to the population numbers over this short timescale.

Table 3: Numbers of orange-bellied parrots at Melaleuca over the breeding season 2010-2015 (Source: Troy and Gales 2016)

Number of orange-bellied parrots	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Number identified adult males at start of season (minimum)	13	14	10	7	17	15
Number identified adult females at start of season (minimum)	7	8	9	11	18	8
Total number of birds returned at start of season	25	22	19	18	35	23
Number of captive-bred birds released at start of season	0	0	0	24	27	13
Number (and %) captive bred birds, released at Melaleuca, assessed to have survived to the end of the season	n/a	n/a	n/a	10 (42%)	18 (67%)	11 (85%)
Total number of fledglings (minimum)	27	14	24	39	29	18
Total number of birds presumed to have migrated from Melaleuca	31	36	43	67	62	45

Orange-bellied parrot breeding effort and productivity at Melaleuca

The number of nests occupied by orange-bellied parrots and the number of chicks that survive until they fledge have been recorded since the 1993/94 season (see Figure 5 below). The number of fledglings raised generally trends up or down relating to the number of nests, but with much larger variations; between 2000/01 and 2001/02 there was a 40% jump in fledgling numbers but only a five percent increase in the number of nests. The reasons for the large variations between seasons and the large declines are unknown. The numbers for the last three seasons include nests made by, and fledglings reared by, captive-bred birds released at Melaleuca,

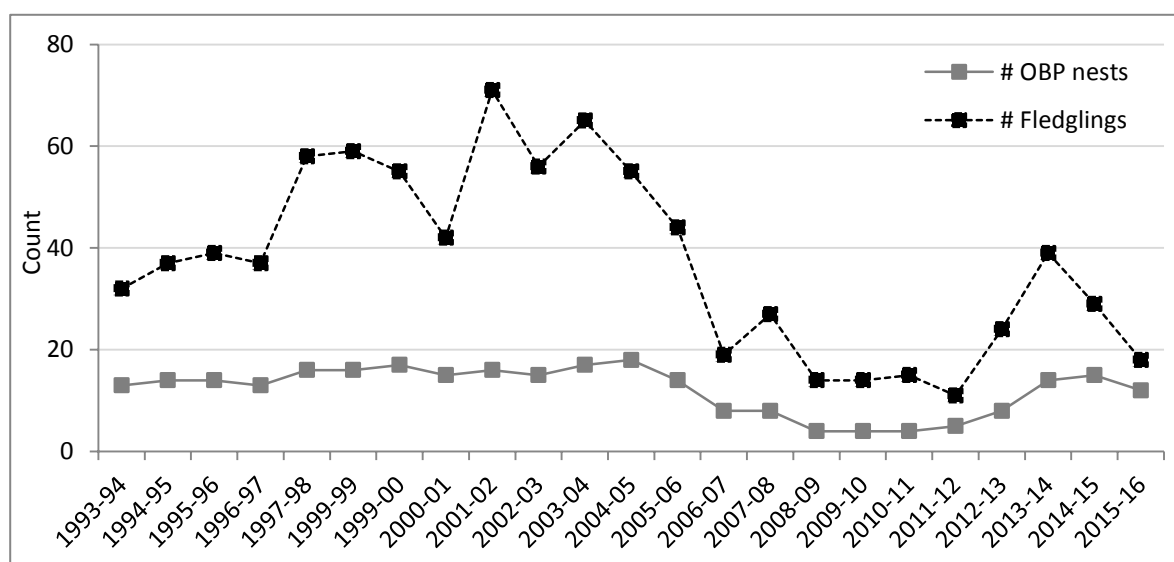


Figure 5. Number of orange-bellied parrot active nests or 'clutches' (grey line) and fledglings (dashed black line) at Melaleuca from 1993-94 to 2015-16 (Source: Troy and Gales, 2016).

Breeding success is the number of chicks that survive long enough to fledge and be banded (at the end of the breeding season) as a proportion of the number of eggs laid in nests (at the start of the breeding season). The dips in breeding success at Melaleuca (Figure 6) occur in the same years as the dips in total fledgling numbers above, but the results diverge several times in the pattern of peaks. The reasons for the large variations between seasons, the increasing variability and the significant recent declines are unknown. The numbers for the last three seasons include eggs laid and fledglings reared by captive-bred birds released at Melaleuca.

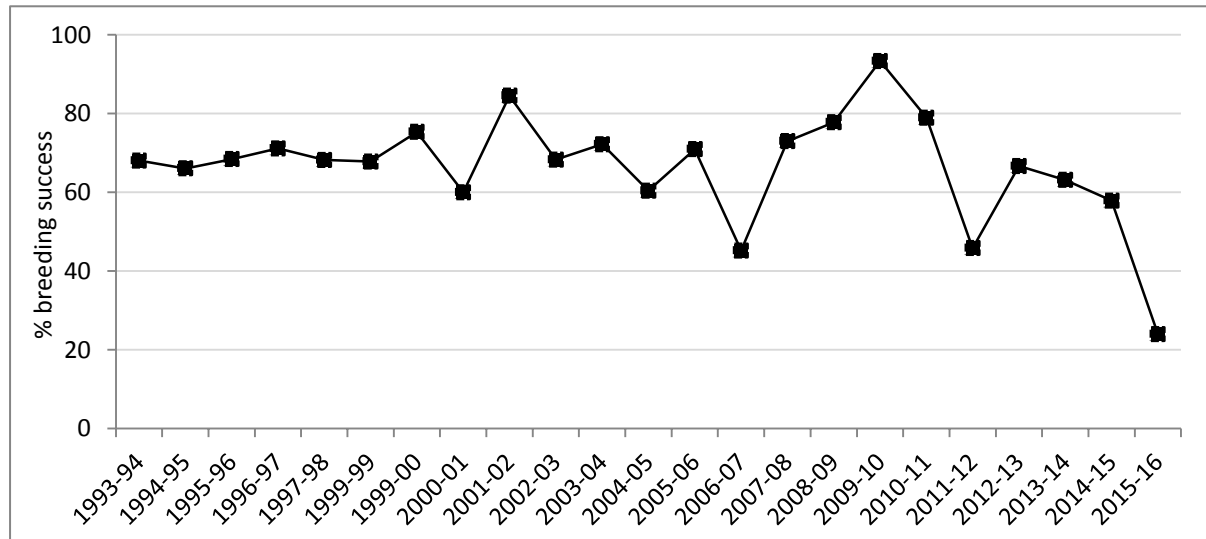


Figure 6. Orange-bellied parrot breeding success at Melaleuca from 1993-94 to 2015-16 (Source: Troy and Gales, 2016).

Pressure indicators

Competition for nest sites is thought to be a significant threat to orange-bellied parrots. Therefore, considerable effort has been expended in providing ample nestboxes, in modifying the design to prevent larger birds and mammals from entering, in removing the nests of competitors from nestboxes, and in some cases, actually killing nest competitors.

Nine species have been observed using the nestboxes installed for orange-bellied parrots, including two possum species and a bat (see Table 4 below). Tree martins are by far the most prevalent nest site competitors, consistently occupying at least half of the nest sites. As more nestboxes are added, more are occupied by tree martins (Troy and Gales, 2015). Tree martins are a small bird native to Tasmania.

Table 4: Nestbox occupancy and competitors at Melaleuca, 1992/93 to 2006/07 and 2013/14 to 2015/2016

Year	Total boxes	Empty boxes	Orange-bellied Parrot	Tree martin	Common starling	Ants present	Chocolate wattled bat	Eastern pygmy possum	Common ringtail possum	Australian owlet nightjar	Green rosella	Honey bee
1992/93	21	6	8	6	0	1	0	0	0	0	0	0
1993/94	23	2	13	6	0	2	0	0	0	0	0	0
1994/95	24	3	14	6	0	1	0	0	1	0	0	0
1995/96	42	8	14	12	1	7	0	0	0	0	0	0
1996/97	42	6	13	15	1	7	0	0	0	0	0	0
1997/98 ¹	42	6	16	12	6	7	0	0	0	0	0	0
1998/99 ²	42	3	16	19	0	5	1	0	0	0	0	0
1999/00	44	2	17	20	1	4	0	0	0	0	0	0
2000/01	46	2	15	23	0	2	0	1	1	1	0	1
2001/02	47	1	16	25	0	2	0	0	0	1	1	1
2002/03 ³	49	0	15	29	4	3	0	0	0	1	1	0
2003/04	52	3	17	26	3	1	0	0	0	0	2	0
2004/05	48	4	18	25	0	1	0	0	0	0	0	0
2005/06 ⁴	48	4	14	28	1	2	0	0	0	0	0	0
2006/07	48	7	8	32	0	1	0	0	0	0	1	0
2013/14 ⁵	73	10	12	39	1	2	1	0	1	0	1	0
2014/15	79	11	11	54	1	0	0	0	1	0	1	0
2015/16 ^{6,7}	92	15	11	63	1	2	0	0	0	0	1	0
Total		93	248	440	20	50	2	1	4	3	8	2

Notes: Nestbox occupancy at Melaleuca from 1992-93 to 2006-07 (from Orange-bellied Parrot Recovery Program Tasmanian Report 2008) and 2013-14 to 2015-16 (Troy and Gales, 2016). Data for 2007-08 to 2012-13 are not available. ¹ Five boxes were occupied by starlings in October. All but one bird was removed prior to orange-bellied parrot (OBP) breeding. ² One OBP shared a nestbox with tree martins and the bat was in another box with tree martins. ³ Three tree martins nested on top of abandoned starling nests that were destroyed early in the season. ⁴ OBP egg (infertile) found on top of a failed starling nest. ⁵ OBP egg (infertile) found under a tree martin nest. ⁶ Two OBP nestboxes contained adult OBP but no nest bowl or nest contents. ⁷ Starling nest found under a tree martin nest.



Motion-activated cameras have been installed at Melaleuca to record the variety of nestbox competitors and predators. Nestbox competitors include native green rosellas (top left) and tree martins (top right), while predators of nestlings include currawongs (left).
Photos: DPIPWE

One of the newly designed nestboxes on poles installed at Melaleuca. The aim is to provide additional nesting sites for orange-bellied parrots in close proximity to the feeding tables.

Photos: Rosemary Gales/DPIPWE



Outcomes

Table 5: Expected and actual outcomes of this project

Expected outcomes	Actual outcomes/outputs
A. GOAL AND KEY DESIRED OUTCOMES	
<i>Overall Management Goal:</i>	
<ul style="list-style-type: none"> A wild population of the orange-bellied parrot that, with limited species-specific management, has a high likelihood of persistence in nature 	<ul style="list-style-type: none"> Orange-bellied parrots have persisted in the wild over the management period (since 1999), albeit at very low levels and with significant management intervention, including releases of captive-bred birds. There are grave concerns for the persistence of this species in the wild.
<i>Key desired outcomes:</i>	
<p>(i) A stable or increasing population in the wild</p> <p>(ii) Increased capacity of the captive population to support future releases of captive-bred birds to the wild and provide a secure long-term insurance population.</p> <p>(iii) Habitat for orange-bellied parrots protected and enhanced to maintain and support an increase in the wild population.</p>	<p>(i) The total wild population of orange-bellied parrots continued to decline over the management period from an estimated 200 individuals in 1999 to around 50 individuals in 2010 (Garnett <i>et al.</i>, 2011). At the start of the 2013/14 season, only 18 birds returned to the sole remaining breeding site at Melaleuca. Following two seasons of releases of captive-bred birds and natural breeding, 35 birds returned to Melaleuca at the start of the 2014/15 season and 62 birds left Melaleuca at the end of that season. Twenty-three orange-bellied parrots returned to Melaleuca in 2015/16. It is presumed that 46 migrated at the end of this most recent season.</p> <p>Multiple attempts were made, over ten years, to re-establish a breeding population of orange-bellied parrots at the Birchs Inlet former breeding site. Some birds survived and bred at the site in the months following the spring releases, but the reproductive success and returns to the site in following seasons were very low and a second population failed to re-establish.</p>
	<p>(ii) The captive insurance population has been steadily increasing and as of April 2016 comprised about 330 birds. These are housed at five different locations in four Australian states. The captive population is considered to contain sufficient birds to support the captive release program. More space is considered necessary at a number of breeding facilities to increase the breeding capacity.</p>
	<p>(iii) Management activities to enhance habitat through supplementary feeding, provision of nestboxes and control of nestbox competitors at Melaleuca are likely to have supported the species. A suitable burning regime to maintain suitable foraging habitat for orange-bellied parrots at Melaleuca is under development.</p>

Expected outcomes	Actual outcomes/outputs
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B. OTHER ANTICIPATED OUTCOMES/IMPACTS

Benefits to visitors and tourism

Orange-bellied parrots are an attraction for visitors to Melaleuca, which is an identified Visitor Services Site for the TWWHA under the statutory management plan.

Over the management period, summer visitors to Melaleuca have enjoyed the opportunity to see one of the world’s most threatened birds, talk with volunteers and learn about recovery activities at the site. This has benefitted visitors and a range of ecotourism operators. For example, Melaleuca is increasingly becoming a popular destination for bird-watching tours (DPIPWE 2014: 23).



To reduce the risk of human disturbance to the birds, the feeding table was moved away from the former bird hide site, which made it more difficult for the public to see the birds. In 2015 the feed table outside the old bird hide (now the Deny King Museum) was rebuilt so that visitors may more easily see these rare and iconic birds.

C. UNANTICIPATED OUTCOMES AND/OR LEGACY

None identified to date.

Assessment and commentary on management performance

Table 6: Assessment of management performance

LEVEL OF PERFORMANCE	EFFECTIVENESS <i>To what extent did the project achieve its objectives?</i>	EFFICIENCY <i>To what extent was the project delivered on time and on budget? Were resources, including time and effort, used wisely and without wastage?</i>
Great result		
Satisfactory/Acceptable result		
Unsatisfactory/Unacceptable result		

Comments on management performance

Summary statement on performance

Orange-bellied parrots have been in long-term decline for more than a century and the wild population continued to decline over the management period. With numbers now critically low, the species is at grave risk of extinction in the wild.

Significant progress has been made in establishing a captive insurance population, augmenting the wild population, and implementing a variety of actions to protect and enhance both breeding and over-

wintering habitat. However, the overall management goal of a wild population that, with limited species-specific management, has a high likelihood of persistence in nature, has not yet been achieved. Hence performance in relation to effectiveness is considered unsatisfactory.

Management of orange-bellied parrots is particularly complex as the species is migratory, and thus there are many factors outside the control of the TWVWA management agency that are contributing to this performance result.

Whilst the wild population of orange-bellied parrots remains extant and displaying natural behaviours, ongoing translocations of captive-bred birds to Melaleuca is considered to be of vital importance for supporting the persistence of the species in the wild.

Key factors contributing positively to management performance

- There was 'a striking example of responsiveness' to the monitoring data to March 2010 which indicated that the orange-bellied parrot was likely to go extinct in the wild within five years. The Orange-bellied Parrot Recovery Team 'prepared an emergency action plan... to address this situation within one month. By April, State and Federal Governments and agencies had endorsed the action plan, and committed the resources and funding to implement the plan. While the OBP remains at high risk of extinction in the wild in the near future, these urgent actions have maintained options for the future. It is unlikely these options would have remained available without the swift response that occurred in 2010' (Pritchard 2014: 3).
- Management actions at Melaleuca, including supplementary feeding, provision of artificial nestboxes, control of predators and nest competitors, and biosecurity actions to minimise transmission of disease, are likely to have contributed positively to breeding success and survival. Habitat enhancement activities within the over-wintering range are also likely to have been beneficial for the species.
- Long-term and on-going surveying for the birds across the potential over-wintering range has highlighted significant change in use patterns by the birds (now semi-nomadic and avoiding areas with human development, Ehmke and Tzaros 2009). There has been some increase in understanding of the threats facing the species over winter.
- Successful recent introductions of captive-bred orange-bellied parrots to Melaleuca, coupled with increasing understanding of strategies that increase survival when captive birds are released, and a generally well-managed captive population, have increased the wild population and improved the efficacy of the captive release program.
- The addition of 21 new wild-caught birds to the captive population in 2011 increased fecundity and fledging success in the current captive population, giving strong indications that there has been some genetic outbreeding. Orange-bellied parrots are now breeding well in captivity. This has enabled the building of an effective insurance population and provision of birds for release into the wild.
- A thorough review of the Orange-bellied Parrot Recovery Plan (Pritchard 2014) identified areas for improvement. Implementation of the recommendations of the review has resulted in regular analysis of population data and setting of clear objectives that can be measured and that relate directly to the recovery of the species.
- Capable and dedicated volunteers assisting in the monitoring program have been vital to its success. Wildcare/ DPIPWE volunteers (particularly Friends of the OBP) observe and monitor the population of orange-bellied parrots at Melaleuca for six to seven months every year, contributing over 300 person-days each year. During the 2015/16 season, volunteers also undertook enhanced biosecurity activities that appear to have reduced disease transmission amongst the birds.
- Significant support from passionate sectors of the community brought increased attention to the plight of orange-bellied parrots, and raised money for recovery efforts through fund-raising activities that included collecting donations and submitting grant applications.
- Improvements in project governance arrangements within DPIPWE and the working groups of the Recovery Team have increased efficiency and expertise. For example, in 2015 the Veterinary

Technical Reference Group was formed to support and provide advice on orange-bellied parrot health, disease and biosecurity-related management actions and issues in relation to the broader context of the National Recovery Plan.

- The Orange-bellied Parrot National Recovery Team identified that filling the role of Orange-bellied Parrot Recovery Program Coordinator was a key factor contributing to the effectiveness of the team (DEWLP 2016). In 2016, DPIPWE committed to providing assistance to the Chair of the National Recovery Team in coordination.
- It is likely that the recently produced advocacy materials (website, brochure, postcard, program logo) will assist in promoting the Orange-bellied Parrot Tasmanian Program by increasing public awareness and recognition, and by making it easier to donate or become a volunteer with the program.

Key factors limiting or threatening management performance

- Limited funding and resources over many years prevented some recovery actions from being undertaken, hampering the achievement of recovery objectives (Pritchard 2014; Orange-bellied Parrot National Recovery Team 2014). The Pritchard 2014 review of the then-current Recovery Plan identified in lessons learnt: ‘the importance of managing the risk of under-funding to ensure high priority actions are implemented, including developing a clear procedure for prioritisation’ (Pritchard, 2014: 3). Refer to Appendix I.
- The 2014 Recovery Plan review also identified the following limiting factors:
 - ‘delays in data analysis and interpretation prevented adaptive management from occurring for much of the period of interest’ (2006-2011) and, therefore, a recommendation was made for ‘regular and appropriate analyses and interpretation, and use of those analyses to inform timely decisions’;
 - the ‘need for plans to include objectives that can be measured, and that clearly link with recovery of the species’ (Pritchard 2014: 3, see Appendix I). More recent plans have addressed this need.
- There is incomplete understanding, and more importantly an inability to control, the critical factors influencing orange-bellied parrot population decline across its range. This includes habitat loss/ degradation and competition/ predation in areas including north-west Tasmania and Bass Strait islands, as well as the Australian mainland. ‘Development and land use change along the populated coastline of western Tasmania, King Island, and south-eastern mainland Australia continues to either permanently remove non-breeding habitat, or render non-breeding habitat unsuitable’ (DELWP 2016: 11). This factor has been exacerbated because ‘the rate of decline of the species outpaced the capacity to understand the ecology and address the causes of decline’ (Pritchard 2014: 4).
- The migratory habit of the species involves multiple states and jurisdictions. This presents challenges for integrated management and governance of the recovery program. The 2014 review found that there had been ‘insufficient attention paid to governance and to appropriate levels of ownership of responsibilities and accountabilities’ (Pritchard 2014: 4).
- Decision-makers have tended to prioritise proposed development and changes in land-use (especially changes promising economic benefits) over the protection of habitat for rare and threatened species. The view that orange-bellied parrots were stopping development was famously expressed by the former (then) Premier of Victoria, Jeff Kennett, who labelled the orange-bellied parrot as a ‘trumped-up corella’ (Orange-bellied Parrot Recovery Team 2006b).
- There has been a lack of, or incomplete, implementation of orange-bellied parrot fire management plans which prescribe planned burns to enhance critical breeding habitat. ‘Limited fire in the breeding range between 2000 and 2010 may have reduced the amount of habitat of the preferred age-class and contributed to the observed decline in breeding participation by females’ (DELWP 2016: 11). The difficulty of implementing the planned burns has increased considerably over time as a result of increasing fuel loads, more stringent agency requirements for risk management, and limited budgets.

- The reasons for the failure of a second breeding population to establish at Birchs Inlet, despite translocation of over 400 captive-bred birds and a ten-year program, remain unknown.
- Until 2013, lack of documentation on monitoring data storage and recovery action protocols sometimes led to resources not being applied as efficiently as desirable. Real-time data entry and analysis is now being implemented to ensure that management decisions are well informed and implemented in a timely manner.
- There is uncertainty about the impact of human disturbance on the birds. The activities of planes, helicopters and visitors at Melaleuca could be influencing bird behaviour. There is very limited information available about the impact of individual sources of disturbance on orange-bellied parrots and the cumulative impacts are unknown.

Suggestions for improving management performance

- Certainty of adequate, multi-year funding is needed to enable effective and efficient implementation of the species recovery plan. For example, this would allow adequate staffing and resourcing to prioritise implementation of appropriate management programs for the wild population and to increase the capacity of the captive breeding program.
- Identification and, if required, protection or restoration of critical winter habitats for orange-bellied parrot is vital to the recovery of the species.
- Further mapping is required to determine all breeding habitat critical to the bird's survival (DELWP 2016) and to monitor the condition of this habitat.
- Implementation of the species Fire Management Plan is needed to increase the extent and quality of the breeding habitat at Melaleuca.
- A disease risk assessment would assist in assessing the risk and potential impacts of disease on the bird population. The risk of infectious disease must continue to be considered in the management of the critically small, wild population.
- Development and implementation of a meta-population strategy is required to manage the captive and wild populations of orange-bellied parrots in an integrated manner.
- Further research into bird responses to noise and other human disturbance would assist direct recovery efforts.
- Assessment and decision-making processes for proposed activities within the breeding habitat for orange-bellied parrots could take a more precautionary and risk-averse approach that prioritises conservation of this critically endangered species.

Investment in this project

Funding from the Australian and Tasmanian Governments has been core to this program. Funding has been provided through the Tasmanian Wilderness World Heritage Area Joint Management Agreement (Australian and Tasmanian Governments), recurrent state government funding, national threatened species recovery programs and other grant programs.

The Australian Federal Government announced a \$525,000 rescue package for the species in June 2015. The package is called 'Save the Orange-bellied Parrot Program: Implementation of Critical Recovery Actions in Tasmania'. The Tasmanian Government has made a contribution of \$800,000 to complement the Federal Government grant.

Delivery of the Tasmanian Orange-bellied Parrot Program is undertaken by staff of DPIPWE Natural and Cultural Heritage Division— four full-time bird keepers at the Taroon breeding facility plus scientific, veterinary and management staff based in Hobart (currently a total of nine staff are involved, filling 5.9 full-time equivalent positions). Field staff from PWS also provide operational support, particularly during the breeding season.

A grant of \$260,000 from the Australian Government in 2010 allowed the Orange-bellied Parrot Recovery Team to implement 18 months of emergency efforts outlined in the emergency action plan.

Apart from DPIPWE and the Australian Government, the Victorian and South Australian Governments, the Zoos and Aquarium Association, captive breeding institutions, Wildlife Health Australia and research institutions have all invested in the recovery program.

Birdlife Australia in South Australia and Victoria, with the Nature Glenelg Trust and the Bellarine Peninsula Orange-bellied Parrot Regional Group, organise bird surveys with volunteers three times a year, to survey the known over-wintering habitat.

Wildcare's Friends of the OBP Branch continues to provide significant support to the program by providing and co-ordinating volunteers at Melaleuca for seven months each year. In 2014/15, 29 volunteers were involved. In 2013/14, 308 person-days of volunteer time was given. Volunteer contributions to monitoring the birds at Melaleuca, in other parts of Tasmania and in South Australia and Victoria were estimated to be worth \$1,250,000 per year (DELWP, 2016). Some of the volunteers have dedicated months of their time, making a significant contribution over many years.

Wildcare grants over the years have covered travel costs to allow volunteers to be stationed at Melaleuca for six or seven months each year. For example, Wildcare Inc provided over \$10,000 in 2015 to support program infrastructure, equipment and volunteer travel costs. DPIPWE secured a grant of \$14,470 from the Foundation of National Parks and Wildlife to support the 2014/15 field program. Friends of the OBP Wildcare Branch secured an NRM South 'Naturally Inspired' Grant of \$4,820 for the 2014/15 season and a Wildcare Board of Management grant of \$1,680 for the 2013/14 season.

Various community groups and private fundraisers have held events to support mainland facilities for the captive breeding program. In 2013, Australian Geographic ran a successful fundraising campaign which raised \$30,606.30 to support wild population recovery activities.

Donations continue to be received through Tasmania's Wildcare Save the OBP fund—go to <http://dPIPWE.tas.gov.au/obp>.

Sources

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Dr Rosemary Gales has been Project Manager for the DPIPWE Orange-bellied parrot program for the last four years. The project team is based at the DPIPWE head office in Hobart. Rosemary has a background in conservation wildlife biology and has implemented recovery programs for threatened species for more than 20 years.

Photo: DPIPWE

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Christine Corbett (PWS Planning and Evaluation) prepared this case study, with input from Rosemary Gales and Shannon Troy (Natural Values Conservation Branch).

Glenys Jones (Coordinator, Evaluation) guided preparation of this report.

Dixie Makro (PWS Interpretation Officer – Publications) assisted with graphic design.

References and further information

For more information on the topics below, follow the links to the DPIPWE website:

- [Orange-bellied-parrot](#)
- [Tasmanian Wilderness World Heritage Area](#)
- [Performance monitoring, evaluation and reporting for Tasmania's national parks and reserves](#)

References

- Brown, P.B. and Wilson, R.I 1982. The orange-bellied parrot pp. 107–115 in Groves, R.H. and W.D.L. Ride (Eds) *Species at Risk: Research in Australia*. Australian Academy of Science, Canberra.
- Brown, P.B. and Wilson, R.I 1984. *Orange-bellied Parrot Recovery Plan*. National Parks and Wildlife Service, Hobart.
- Connors, B. 1998. *Statistical Analysis Summary: Orange-bellied Parrot Melaleuca Population Study 1991/92-1996/97*. Birds Australia.
- Department of Environment, Land, Water and Planning 2016. *National Recovery Plan for the Orange-bellied Parrot, Neophema chrysogaster*. Australian Government, Canberra.
- Department of Primary Industries, Parks, Water and Environment 2014. *Site and Rehabilitation Plan, Melaleuca Southwest National Park*. Parks and Wildlife Service, Hobart.
- Department of Primary Industries, Parks, Water and Environment 2015. *DPIPWE Biosecurity and Disease Management Protocols for Captive and Wild Orange-bellied Parrots in Tasmania*. Department of Primary Industries, Parks, Water and Environment, Hobart, Tasmania. Available online at following link: [DPIPWE Disease Management Protocols for OBP in Tasmania](#).
- Department of Primary Industries, Water and Environment 2005. *Orange-bellied Parrot Recovery Plan - Implementation*. Unpublished project report for project number 13164.
- Ehmke G. and Tzaros, C. 2009. *Assessments of Orange-bellied parrot non-breeding foraging habitat (2006-2007)*. Birds Australia, Melbourne.
- Garnett, S.T. and Crowley, G.M. 2000. *Recovery Outline – Orange-bellied Parrot, in The Action Plan for Australian Birds 2000*. Environment Australia, Canberra.
- Garnett, S., Szabo, J. and Dutson, G. 2011. *The Action Plan for Australian Birds 2010 – Emergency Action Plan excerpt Orange-bellied Parrot*. Birdlife Australia; <http://birdsindanger.net/taxatable>.
- Higgins, P.J. (ed) 1999. *Orange-bellied Parrot Neophema chrysogaster, in Handbook of Australian, New Zealand and Antarctic Birds volume 4 – Parrots to Dollarbird*. Birds Australia, Oxford University Press.
- Hogg, C., Hockley, J. and Murray, N. 2014. *Orange-bellied Parrot: Status of Captive Insurance Population, April 2014*. Zoo and Aquarium Association, Australia.
- Holdsworth, M. 2006. *Reproductive success and demography of the Orange-bellied parrot (Neophema chrysogaster)*. University of Tasmania Masters thesis, Hobart.
- Holdsworth, M., Dettmann B. & G. B. Baker 2011. *Survival in the orange-bellied parrot (Neophema chrysogaster)*. *Emu* 111:222-228.
- Hunt, G. (Federal Minister for the Environment) and Groom, M (Minister for the Environment, Parks and Heritage, Tasmania) 2015. *Half million dollar rescue package for orange-bellied parrot*. Media release, Canberra, 12th June 2015. Viewed 23rd May 2016 <https://environment.gov.au/minister/hunt/2015/mr20150612.html>
- Matthews, G. 1917. *The Birds of Australia Vol. 6*. Witherby, London.

- McCarthy, M. 1995. Stochastic Population Models for Wildlife Management. Unpublished PhD thesis, School of Forestry, the University of Melbourne.
- Menkhorst, P. W., Loyn, R. H. and Brown, P. B. 1990. Management of the orange-bellied parrot. In Management and Conservation of Small Populations, eds T. W. Clark and J. H. Seebeck, pp. 239-251. Chicago Zoological Society, Chicago, IL.
- North, A.J. 1912. Nests and Eggs of Birds Found Breeding in Australia and Tasmania Vol III. Australian Museum, Sydney.
- Olsen, P. 2013. A Lament. The sad story of the orange-bellied parrot. Australian Birdlife, September 2013: pp. 22-23.
- Orange-bellied Parrot National Recovery Team 2014. Orange-bellied Parrot National Recovery Team Annual Report 2013/14. Tasmanian, Victorian and South Australian State Governments.
- Orange-bellied Parrot Recovery Team 1998. Orange-bellied Parrot Recovery Plan 1998-2002. Parks and Wildlife Service, Hobart.
- Orange-bellied Parrot Recovery Team 2006a. National Recovery Plan for the Orange-bellied Parrot (*Neophema chrysogaster*). Department of Primary Industries and Water (DPIW), Hobart.
- Orange-bellied Parrot Recovery Team 2006b. Background and implementation information for the Orange-bellied Parrot Recovery Plan, Department of Primary Industries and Water (DPIW), Hobart.
- Parks and Wildlife Service 1999. *Tasmanian Wilderness World Heritage Area Management Plan 1999*. Department of Primary Industries, Water and Environment. Hobart.
- Parks and Wildlife Service 2004. *State of the Tasmanian Wilderness World Heritage Area – an evaluation of management effectiveness Report No 1*. Department of Tourism, Parks, Heritage and the Arts, Hobart, Tasmania. <http://parks.tas.gov.au/index.aspx?base=6174>
- Pritchard, R.A. 2014. Review of the Orange-bellied Parrot Recovery Plan (2006-2011). Unpublished report to the Department of Environment, Victoria Government Department of Environment and Primary Industries, Barwon, South West Region.
- Quin, D. and McMahon, A. 2001. Aircraft and Human Activity at Melaleuca and the Orange-bellied Parrot (*Neophema chrysogaster*): The Effects of Helicopters. Prepared for Nature Conservation Branch – Department of Primary Industries, Water and Environment, Hobart.
- Starks, J. and Holdsworth, M. 2003. Draft Orange-bellied Parrot Recovery Plan 2003-2007 (Phase 4), Birds Australia.
- Smales, I., Muir, S. & Meredith, C. 2005. Modelled cumulative impacts on the orange-bellied parrot of wind farms across the species' range in south-eastern Australia. Biosis Research, Melbourne.
- Tasmanian Regional Airspace Users Advisory Committee and Tasmania Parks and Wildlife Service, undated. Fly Neighbourly Advice Tasmanian World Heritage Area and Mt Field National Park. <http://www.parks.tas.gov.au/index.aspx?base=7181>
- [Threatened Species Strategy Action Plan 2015-16 – 20 birds by 2020](#). Australian Government Department of the Environment.
- Threatened Species Scientific Advisory Committee 2006. *Neophema chrysogaster* (orange-bellied parrot) listing advice. Advice to the Minister for the Environment and Heritage from the Threatened Species Scientific Committee on Amendments to the list of Threatened Species under the Environment Protection and Biodiversity Conservation Act 1999, Federal Government, Canberra.
- Troy, S. and Gales, R. 2015. Tasmanian Orange-bellied Parrot Program; Tasmanian Wild Population 2014/15, Report to the National Recovery Team. Natural and Cultural Heritage Division, Department of Primary Industries, Parks, Water and Environment, Hobart.
- Troy, S. and Gales, R. 2016. Tasmanian Orange-bellied Parrot Program; Tasmanian Wild Population 2015/16, Report to the National Recovery Team. Natural and Cultural Heritage Division, Department of Primary Industries, Parks, Water and Environment, Hobart.

Photo gallery



Orange-bellied parrots are a significant natural value of the Tasmanian Wilderness World Heritage Area and are an attraction for visitors to Melaleuca.

Photo DPIPWE



The orange-bellied parrot was selected as the symbol for Southwest National Park - one of the reserves comprising the Tasmanian Wilderness World Heritage Area. This sign at Melaleuca features pictograms of the orange-bellied parrot, the Tasmanian devil (logo of the Tasmania Parks and Wildlife Service), and the UNESCO World Heritage Area logo.

Photo DPIPWE



Orange-bellied parrot inspecting motion activated camera at one of the feeding tables at Melaleuca
Photo DPIPWE



DPIPWE vet Annie Phillips climbing to inspect nestboxes. Photo DPIPWE



Orange-bellied parrots at DPIPWE's captive breeding facility at Taroona (Hobart). The captive breeding program provides birds for release into the wild at Melaleuca. In 2014/15 over 70 chicks were fledged at this breeding facility. Photo DPIPWE

Appendix I: Extract from Pritchard (2014) review of the orange-bellied parrot recovery plan, 2006-2011

Table I: Progress against recovery criteria and notes (Source: Pritchard, 2014)

	Status	Comment
The wild breeding population is increased from approximately 150 to more than 250 individuals.	Not Achieved.	Population declined. Use of Tasmanian counts at Melaleuca to suggest population stability in 2006 shown to be inaccurate. Wild breeding population now estimated at less than 50 birds.
The average life expectancy of individuals in the wild population is increased.	Not Achieved.	One paper suggests that this parameter is not a significant limiting factor (Holdsworth <i>et al.</i> 2011). However, a lack of comparative data prior to population decline, or from similar species, makes this difficult to assert with certainty.
All key sites used by the orange-bellied parrot are identified, protected and managed for the species.	Some Progress.	All key sites have been identified, and many sites receiving active management. However, some important sites in Tasmania have not received sufficient management.
Key threats through the species' range are removed or adequately controlled.	Some Progress.	Predator and weed management occurs throughout much of the range. Threats remain in significant unmanaged habitats. Hydrological degradation has increased in some areas.
At least one other viable sub-population in the breeding range is established.	Not Achieved.	Translocation trial unsuccessful but provides important information for planning future translocations.
Public support for the conservation of the orange-bellied parrot is increased.	Unknown.	Increased volunteer participation and some indications of landowner support. No baseline data are available by which to measure changes in general public support.
The captive population contains at least 150 individuals and maintains genetic diversity equivalent to the wild population.	Some Progress.	Population reached 150, new founders collected in 2010 and 2011 to capture more genetic variation, but the new founders have yet to contribute to the captive population (in 2011).

Some of these criteria operate on time-scales beyond the five year review period, so an interim performance assessment can only measure progress towards these outcomes. Therefore, 'Some Progress' is the best outcome for some criteria.

The poor performance against the remaining recovery criteria is due to one or more of the following:

- funding and resource limitations prevented many actions from being started or completed, which prevented many objectives from being achieved;
- positions responsible for implementing actions, and collating and analysing data to inform governance of the recovery program were not funded;
- delays in data analysis and interpretation prevented adaptive management from occurring for much of the period of interest;
- the rate of decline of the species outpaced the capacity to understand the ecology and address the causes of decline;
- insufficient attention paid to governance and to appropriate levels of ownership of responsibilities and accountabilities;
- the relationships between recovery criteria, specific objectives, recovery actions, performance criteria and tasks were not clear in some parts of the Plan. It is unclear that completion of all tasks would have meant that all specific objectives were met and that recovery criteria were progressed.



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