



**NATIONAL RECOVERY PLAN**  
for the  
**ORANGE-BELLIED PARROT**  
*(Neophema chrysogaster)*

**2006 - 2010**

The Orange-Bellied Parrot  
Recovery Team

This document is based on a draft recovery plan prepared by Jonathan Starks and Mark Holdsworth in 2004 for the Orange-bellied Parrot Recovery Team

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This Recovery Plan sets out the actions necessary to stop the decline of, and support the recovery of, the listed threatened species. The Australian Government is committed to acting in accordance with the Plan and to implementing the Plan as it applies to Commonwealth areas.

The Plan has been developed with the involvement and cooperation of a broad range of stakeholders, but the making of this Plan does not necessarily indicate the commitment of individual stakeholders to undertaking any specific actions. The attainment of objectives and the provision of funds may be subject to budgetary and other constraints affecting the parties involved. Proposed actions may be subject to modification over the life of the Plan due to changes in knowledge.

Copies of the recovery plan are available online from:

<http://www.deh.gov.au/biodiversity/threatened/recovery/list-common.html>

Or by mail from:

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## Foreword

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The Orange-bellied Parrot is an Australian icon in terms of a national conservation effort for a highly threatened species. It exemplifies an outstanding effort by four States and the Australian Government in working together to conserve a species which knows no State boundaries and yet is reliant on the resources within each of those States for its survival.

The Orange-bellied Parrot, or OBP as all those close to the welfare of this species like to refer to it, is an ideal test for governments and the private sector to put real meaning into the often quoted term “sustainable development”. My understanding of this is to ensure that development does not have an adverse impact on the natural environment and its many components. With such a small population the OBP could easily be forced into extinction through changes to its environment. Its welfare is a substantial test for those who plan developments within its breeding and migratory range to ensure it is not adversely affected. It is essential that a close working relationship is maintained between the planners and those responsible for the management of the parrot.

Huge efforts to ensure the survival of the OBP have occurred for almost 30 years, involving governments, conservation organisations and community. The efforts still continue undiminished with, in many cases the commitment of individuals who have been actively involved for much of that time. It is great testament to so many people that their efforts continue unabated.

This Recovery Plan is the fourth plan for the OBP and includes the actions required to assist its conservation for the next 5 years. It comes at a time when the survival effort for the species will be increasingly tested due to the unprecedented development pressures on Australia’s coastline, the preferred winter habitat of OBPs, including the unprecedented proliferation of development proposals for establishing wind farms throughout its entire range outside the breeding habitat. Cumulative impacts of large numbers of wind turbines are difficult to predict. It is to be hoped that the planners have got it right.

My own interest in the OBP dates back to 1979. I first saw a flock of more than 40 birds feeding in the saltmarshes at Point Wilson near Werribee. I well remember the excitement at that first sighting of such a rare and beautiful little parrot. My earnest wishes are that the efforts to secure it will continue undiminished and that the resources will be found to implement this Recovery Plan for the next five years.

Peter Brown

## Preface

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The Orange-bellied Parrot Recovery Plan has been prepared under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to guide recovery activities within a planned and logical framework. This Recovery Plan is also subject to consideration and adoption under respective threatened species legislation in the four range States (New South Wales, South Australia, Victoria and Tasmania). This Recovery Plan does not necessarily represent the views or official position of any agency represented on the Orange-bellied Parrot Recovery Team (OBPRT) and may be modified subject to new findings, changes in species' status and completion of recovery actions.

The results of actions implemented from the previous Recovery Plans (Brown & Wilson 1984; Stephenson 1991; OBPRT 1999) and recommendations from Saunders (2002) Major Project Review lay the foundation for developing strategies in this Plan which covers the period 2006–2010. The production of this Plan was delayed due to limitations on project officer time and procedural matters. Actions undertaken during the period 2003–2005 were conducted in accord with the previous plan (OBPRT 1999) and were mostly confined to achievable on-going actions. This Plan supersedes earlier recovery plans for the species and the Victorian Action Statement (Edgar & Menkhorst 1993), which will be updated to reflect this Plan.

This Plan summarises a large body of information on the Orange-bellied Parrot to provide a concise approach to recovery implementation. Detailed information on previous recovery plans, species description, life history, biology, population status and threats are contained in the *Background Information on the Orange-bellied Parrot* (<http://www.deh.gov.au/biodiversity/threatened/recovery/list-common.html>).

This Recovery Plan has been prepared with due consideration given to the objects of the EPBC Act.

## Species Information and General Requirements

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### Species details

#### *Conservation status*

The OBP is protected by State and Commonwealth legislation throughout its range. The OBP is listed as Endangered nationally under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The OBP is listed as Threatened under the *Victorian Flora and Fauna Guarantee Act 1988*; as Endangered in Schedule 1 of the *Threatened Species Protection Act 1995* in Tasmania; as Endangered in Schedule 7 of the *National Parks and Wildlife Act 1972* in South Australia; and as Endangered in Schedule 1 of the *Threatened Species Conservation Act 1995* in NSW.

The International Union for Conservation of Nature and Natural Resources (IUCN) lists the OBP as Critically Endangered (IUCN 2002) as does the Action Plan for Australian Birds 2000 (Garnett and Crowley 2000) and the Advisory List of Threatened Vertebrate Fauna in Victoria (DSE 2003).

#### *Population estimates*

During the late 1800s, and in the 1920s, the species was reported widely as being common, or locally abundant (Jarman 1965). The abundance of the Orange-bellied Parrot has declined steadily since the 1920s. Observations of banded and unbanded individuals at Melaleuca (southwest Tasmania) for the period 1994-2004 shows an average minimum population of 92 birds (range 71 – 116). Surveys of other parts of the breeding range in recent years, while problematic due to the wilderness characteristics of the area, nevertheless have not found large breeding populations. The current total population is unlikely to exceed 150 individuals (Mark Holdsworth pers. comm.).

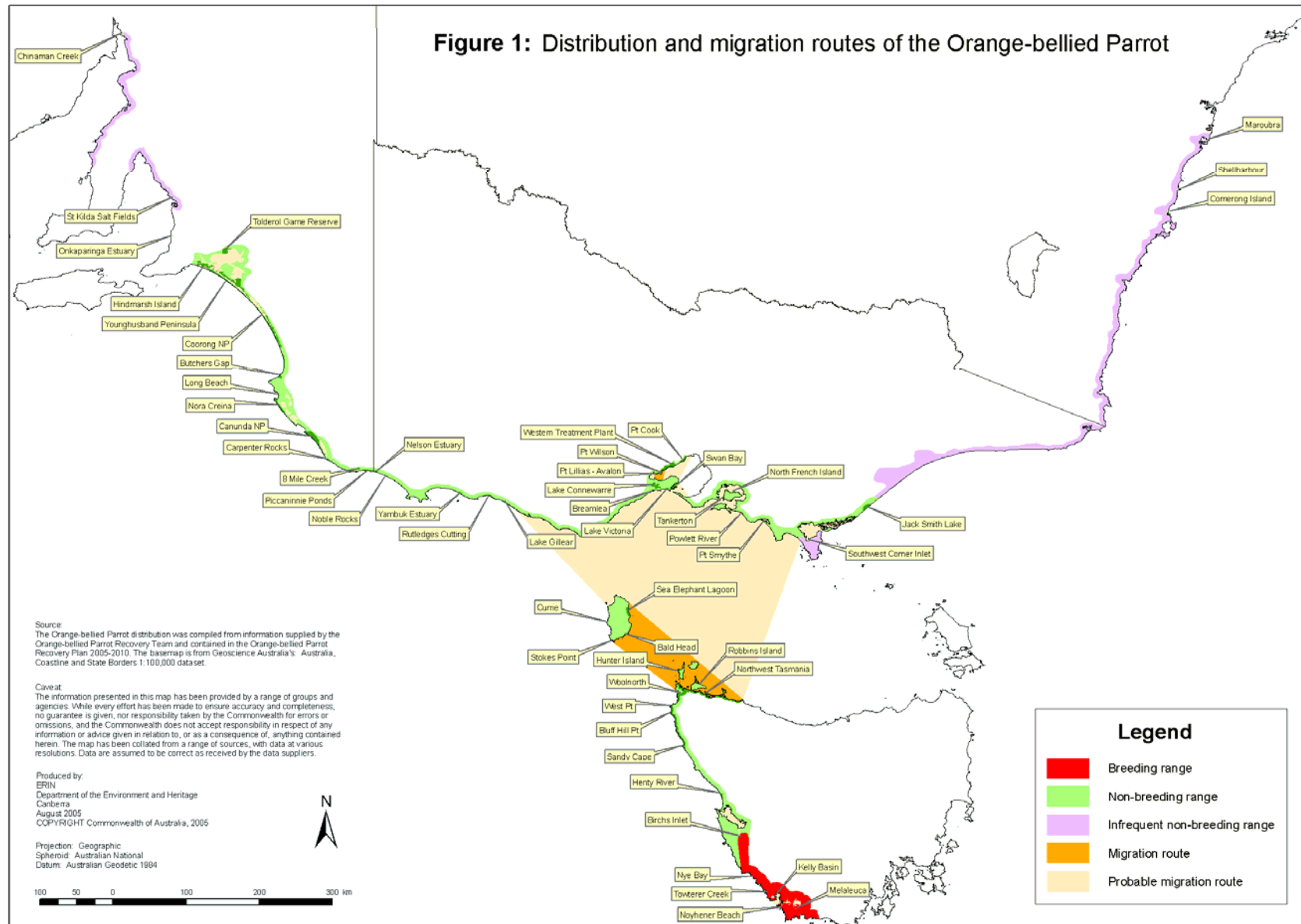
Surveys of the winter population shows that in recent years fewer birds are observed than the summer population at Melaleuca. The reasons for this difference probably indicates that the species is using different habitat, is dispersing into smaller flocks, or is moving beyond traditional search areas during winter.

#### *Distribution*

The Orange-bellied Parrot is endemic to south-eastern Australia. Formerly, the species' range on the mainland extended from Adelaide, and possibly Yorke Peninsula, southeast through the Coorong, Robe, Beachport and Port MacDonnell in South Australia, east through southwestern coastal Victoria, Port Phillip Bay to South Gippsland, and north to near Sydney. In Tasmania the species extended along the west and south coasts, east to Bruny Island (North 1912; McGill 1960; Jarman 1965; Loyn & Kinhill Planners 1980; Brown & Wilson 1982, 1984; Higgins 1999).

The Orange-bellied Parrot is now rarely recorded in large numbers from west of the Murray River in South Australia or east of Jack Smith Lake in South Gippsland, Victoria (Higgins 1999). Recent records of single birds in New South Wales from Shoalhaven, in 1986 (Starks 1988), and at Shellharbour (G. Southwell pers. comm.) and Maroubra, in 2003 (B. Hensen pers. comm.) suggest a low, but unknown level of activity in that State. Figure 1 shows the present distribution of the Orange-bellied Parrot.

The species' current breeding range is a narrow coastal strip of southwest Tasmania between Birchs Inlet, in Macquarie Harbour, and Louisa Bay on the southern coast (see Figure 1). Most breeding activity occurs within 20 km of Melaleuca, in what is considered one breeding population (Brown & Wilson 1984).



*Habitat critical to the survival of the species*

Saltmarshes, coastal dunes, pastures, shrublands, estuaries, islands, beaches and moorlands, usually within ten kilometres of the coast, make up the diverse habitats used by OBPs.

Breeding habitat is a mosaic of eucalypt forest, rainforest, and extensive fire dependant moorland and sedgeland plains, intersected by wooded creeks, rivers and estuaries within the Tasmanian Wilderness World Heritage Area (Brown & Wilson 1982, 1984; Stephenson 1991). Nesting occurs predominantly in the hollows of live Smithton Peppermint *Eucalyptus nitida* in patches of forest throughout coastal southwest Tasmania, but focussed within 20 km of Melaleuca (Brown & Wilson 1984; Higgins 1999). The entire known breeding population is contained within the Tasmanian Wilderness World Heritage Area (in particular the Southwest National Park) and Southwest Conservation Area.

On passage in western and northwestern Tasmania (including offshore islands) the species occurs in dunes, heathland, coastal grasslands, saltmarsh and pasture. On King Island, they mostly occur in saltmarsh dominated by Beaded Glasswort *Sarcocornia quinqueflora*, flanked by tall dense Swamp Paperbark *Melaleuca ericifolia* forest (Higgins 1999).

In Victoria, the species mainly uses saltmarshes dominated by Beaded Glasswort, Southern Sea-heath *Frankenia pauciflora* and Shrubby Glasswort *Sclerostegia arbuscula*, as well as associated grassy and/or weedy pastures. Key sites are along the western shore of Port Phillip Bay, particularly the Spit Nature Conservation Reserve, and on the Bellarine Peninsula at Lake Connewarre Wildlife Reserve and Swan Bay, including Swan Island. In South Australia, beaches, dune frontages and adjacent dune systems and sheltered areas along rocky foreshores are favoured. Little is known of the species' habitat preferences in NSW.

*Mapping of habitat critical to the survival of the species*

Since research into the ecology of the OBP began in 1979, winter habitat and their plant communities has been mapped and described in detail in Victoria (Carr & Kinhill Planners 1979; Yugovic 1984; McMahon *et al.* 1994) and in South Australia (Gibbons 1984; Casperson 1995). A new method of remote sensing to identify saltmarsh communities suitable for OBPs was developed by the Royal Melbourne Institute of Technology (Race 1994a, 1994b). In 1993, a postgraduate study through the School of Botany, University of Melbourne analysed the nutritional content of seeds from the main food plants in the diet of OBPs (D. McDonald, unpubl. report to OBPR). Another postgraduate study at the same institution described the reproductive ecology and phenology of food plants at the Spit Nature Conservation Reserve (Lee 2000, Lee & Burgman undated). The information gained through these studies is being used to assist in decision-making for habitat restoration. In Tasmania, a comprehensive map of all vegetation communities is available (TASVEG). All OBP habitats, including grasslands, heathlands, scrub, wetlands and saltmarshes as well as woodlands and forest are mapped to 1:25000 scale.

**Important populations**

Currently, only one wild breeding population is known. However, some evidence suggests that small sub-populations may exist and further investigation is required. The species forms a single but widely distributed population within the wintering range. Population monitoring throughout the range has been an important component of the recovery program.

## Additional Information

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### International obligations

Protection and conservation of the OBP is consistent with the Convention on Biological Diversity as articulated under the National Strategy for the Conservation of Australia's Biological Diversity.

The OBP is listed in Appendix I under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) as a species threatened with extinction for which international trade in specimens is permitted only in exceptional circumstances. The species is also listed under the Agreement Between the Government of Australia and the Government of Japan for the Protection of Migratory Birds and Birds in Danger of Extinction (Japan-Australia Migratory Bird Agreement or JAMBA). The majority of the breeding population occurs within the Tasmanian Wilderness World Heritage Area, which is declared under the World Heritage Convention.

Note: The OBP is also a Listed Marine Species under the EPBC Act.

The OBP occurs within several Wetlands of International Importance (Ramsar) including:

- The Coorong and Lakes Alexandrina and Albert (South Australia)
- Port Phillip Bay (Western Shoreline) and Bellarine Peninsula; Western Port; Corner Inlet and Gippsland Lakes (Victoria)
- Lavinia (Tasmania)

Sustainable management of OBP resources within these sites is fundamental to the long-term survival of the species.

The legislative basis for meeting Australia's responsibilities under these international conventions is the *EPBC Act*.

### Affected interests

#### *Commonwealth Government*

The species is known to occur on Commonwealth land under the control of the Department of Defence at two sites in Victoria: Swan Island and Point Wilson. Potentially, suitable habitat exists on other Department of Defence land, such as HMAS Cerberus, Vic. During August 2003, an OBP was recorded many times at the Anzac Rifle Range, Maroubra (NSW). Management of these sites is the responsibility of the Commonwealth. In addition, the OBP migrates over Commonwealth waters and some interactions with fishing industries may occur.

Note: The species also occurs in the Commonwealth Marine Area as defined under the EPBC Act.

#### *Conservation and land management agencies*

The Orange-bellied Parrot is a listed threatened species in four states and therefore the State conservation and land management agencies are directly responsible for their protection and management.

#### *Tourism*

Visitor development in the Tasmanian Wilderness World Heritage Area is controlled under the World Heritage Area Management Plan, however, visitor activity and numbers in the Melaleuca visitor service area (the centre of OBP breeding range) lacks stringent control and limitations. Access to some critical habitats in Victoria is already tightly controlled. The Recovery Plan recognises the importance of community interest, expectations and involvement in the recovery process, and the demand by a small component of the tourism market to see OBPs. Implementation of actions of the Recovery Plan will not adversely effect tourism and in some circumstances mutual benefits can be gained through careful management.

*Mining and other natural resource extraction*

Significant areas within Tasmania are subject to existing or potential mineral exploration or mining operation on unallocated Crown Lands and within Conservation Areas (i.e. Hunter Island, Arthur Pieman and Southwest). Australian Titanium Minerals Ltd. is required to protect critical OBP habitat with a mining exclusion zone at its sand mine lease on King Island. Recent exploration activity by Tasgold Pty Ltd within the Southwest Conservation Area in the Elliot Bay/Low Rocky Point region (Tasmania) has been assessed for potential impact on the species. The area is within the potential breeding range of the OBP, but searches thus far have not detected the presence of OBPs. In the event a mining operation is proven this would be subject to a comprehensive Development Plan and Environmental Management Plan under State legislation. The tin mine at Melaleuca, operated by Rallinga Mines Pty. Ltd., does not appear to have any adverse impact on the species under the current low intensity operation. However, increased extraction or significant changes to mine operation may adversely impact on the species.

The current area occupied by shell-grit extraction at the northeastern end of Lake Victoria, southeast of Geelong, has no detectable effect on OBPs, which are occasionally recorded on the southern shore of the lake. Protection of saltmarsh communities on the Bellarine Peninsula will not limit the current shell-grit operation. A basalt quarry adjacent to the upper saltmarsh at The Spit Nature Conservation Reserve is subject to consideration under the *EPBC Act*.

Throughout the non-breeding range, coastal areas are subject to kelp and seagrass extraction. Some of these operations have been subject to careful consideration and implementation of management prescription to avoid impact on the OBP (i.e. kelp harvest within the Arthur-Pieman Conservation Area). However, other operations pre-exist interest in the OBP or have not given due consideration to disturbance and habitat destruction (i.e. kelp harvesting on King Island).

*Natural Resource Management organisations*

This Recovery Plan will involve at least 11 Natural Resource Management regions/organisations throughout the species' range. These organisations will have varying degrees of responsibility to secure funding and implement actions under this Plan through State/Commonwealth partnership agreements and the Natural Heritage Trust.

*Squid fishery*

A potential risk has been identified through the possible attraction of migrating parrots to the lights used on squid boats. This risk will be investigated further under this Recovery Plan in cooperation with Australian Fisheries Management Authority.

*Stock grazing*

Orange-bellied Parrots are known to occur on freehold and Crown land that is used for stock grazing. Grazing, trampling and disturbance associated with this activity can have significant impact on OBPs at some sites. Exclusion of cattle or changes to stocking practices to maintain or improve OBP habitats will affect some local interests.

*Wind energy developments*

Many of the areas subject to wind energy development proposals and speculative investigations in Tasmania, southern Victoria and southeastern South Australia coincide with the migratory and winter range of the OBP. Implementation of the actions of the Recovery Plan could affect the preparation and implementation of environmental impact assessments and habitat management plans by wind energy proponents. Cooperation between wind energy proponents, wildlife agencies and the OBPR is important to ensure best possible outcomes for species.

**Indigenous people**

The OBP occurs on two Indigenous Protected Areas (IPA) – Preminghana and Deen Maar. Parts of this Recovery Plan will require assistance and input from a range of indigenous people who either have management responsibility for affected lands or have a cultural connection to lands critical for the conservation of the OBP. Table 1 lists indigenous organisations that have been consulted and identified during the drafting this Plan.

**Table 1.** Indigenous people representative organisations consulted in the development of this Plan.

Group name	Affected area/s	Responsibility/interest
Tasmanian Aboriginal Land Council	Preminghana IPA	- observation and land management
	Tasmanian Wilderness WHA	- fire management
Ngarrindjeri people	Coorong	- observation, land management, cultural heritage, ecotourism
Framlingham Aboriginal Trust	Deen Maar IPA	- observation, land management, cultural heritage, ecotourism
Wathaurong Aboriginal Cooperative Ltd.	Port Phillip Bay and Bellarine Peninsula	- observation, land management, cultural heritage
Wurundjeri Tribal Land Compensation & Cultural Heritage Council Inc.	Western Port	- observation, land management, cultural heritage
NSW Aboriginal Land Council	southern coast	- observation, land management, cultural heritage

Implementation of relevant actions within this Plan will be undertaken with the approval and cooperation of organisations listed above and/or any other Aboriginal group or individual identified during the implementation period. All activities will be undertaken in a manner that respects the cultural traditions of Aboriginal Nations throughout the species’ range.

**Benefits to other species**

Protection and improved management of saltmarsh and beach/dune vegetation will result from implementing actions within this Plan. The exclusion of stock grazing from these vegetation communities will make a significant contribution to protecting the biodiversity values of these fragile areas. Research into the phenology, hydrology and microtopographical requirements of saltmarsh has greatly increased our understanding of saltmarsh ecology. Major input into management plans for coastal areas within the range of the OBP has resulted in greater protection of many wetland, saltmarsh and beach/dune habitats. Migration studies and surveys through the wintering range have improved our understanding of the distribution and ecology of the Blue-winged Parrot and Elegant Parrot. Implementation of this Recovery Plan is unlikely to have any negative impacts on other native species or ecological communities.

## Social and economic impacts

### *Public information and education*

Community education, awareness and the support of volunteers are important components of this Recovery Plan and essential to the long-term recovery of the species. The OBP has a high public profile and its survival is a prominent issue for industrial and urban developments at key non-breeding sites. Significant social and economic issues are associated with the conservation of the OBP throughout its range. Public access and development of habitat adjacent to populated coastal settlements are keystone issues.

Public awareness of the status of the OBP, and the efforts to save the species is high. The continuing high level of enthusiastic participation in winter counts and the summer observer programs are evidence of public support for the recovery effort. Members of the OBPRT have publicised the recovery effort by writing articles, giving talks to local and national organisations, attending conferences, and encouraging television, radio and print media coverage. Two coloured brochures have been published, one which assists in identifying OBPs, and the other explains the endangered status of the bird and the cooperative recovery effort. The latter, which has been very effective and widely distributed for public information, was updated in 1997. The recovery effort is promoted through an OBP web page which is accessed through the Birds Australia website (<http://www.birdsaustralia.com.au/birds/obp.html>).

Education officers of the State conservation agencies publicise the plight of the species in a range of ways using note sheets, broadsheets, endangered species packages for schools, and the internet (such as <http://www.dpiwe.tas.gov.au>). Interpretive signs have been provided for visitors at Carpenter Rocks, the Melaleuca observatory and at a few key wintering sites around Swan Bay, Victoria. In 1998, the interpretive material at Melaleuca was updated, and now incorporates a video-surveillance system, allowing visitors to view nest box activity. Posters and note cards, published privately, continue to be very popular. Two issues of the OBP recovery Program newsletter *Trumped-up Corella* have been produced. It has been circulated to over 300 supporters and is also available via the OBP web page.

Primary and secondary schools have been involved through having OBP ecology as components of their school natural history curricula and through sponsorship of the nest box program. Numerous tertiary undergraduate and post-graduate studies have been undertaken investigating OBPs and their habitat. The plight of the OBP was even adopted as a theme by the Melbourne street theatre company *Dance Works* in the early 1990s.

A list of published reports, scientific articles and post-graduate studies produced since the OBP recovery program started is provided in the Bibliography of the *Background Information for the Orange-bellied Parrot* (<http://www.deh.gov.au/biodiversity/threatened/recovery/list-common.html>)

### *Economic benefits*

The opportunity for visitors to land at the airstrip at Melaleuca to view OBPs from an observatory is an asset to flight operators and tour guides. Likewise, the commencement of high quality cruise ship tours including guided interpretation of the release program at Birchs Inlet adds value to tourism ventures in the Tasmanian Wilderness World Heritage Area. Many small businesses will realise an economic benefit through the provision of services and supply of equipment during the implementation of recovery actions. Some companies have benefited, or are likely to benefit, from promotion of products and services (some with sponsorship arrangements) that are connected to the implementation of the recovery program.

## Known and Potential Threats

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### *Biology and ecology relevant to threatening processes*

The Orange-bellied Parrot survives as a small, single population. The majority of the population breeds around Melaleuca in southwest Tasmania, though recent efforts may have succeeded in re-establishing a second breeding group at Birchs Inlet. The entire population migrates along the westcoast of Tasmania and crosses western Bass Strait to coastal Victoria. Stochastic factors such as disease, loss of genetic variation, storms during migration, and destruction of nest sites, eggs and chicks by wildfire are important influences on the species' long term survival.

### *Degradation and loss of habitat*

Orange-bellied Parrot habitat has been degraded and lost throughout its range, however, the majority of this impact has occurred within the non-breeding range (i.e. migratory corridors and wintering areas). The major contributing factors are:

- drainage of wetlands for grazing;
- alteration and destruction of saltmarsh for industrial and urban development;
- grazing of native vegetation;
- vegetation clearance for agricultural purposes;
- changes to land use practices; and
- recreational activities.

Incompatible land use practices continue unabated in some areas and species recovery is limited by the capacity to ameliorate these impacts. For example, grazing still occurs on some coastal grasslands and saltmarsh habitats in Tasmania and Victoria.

The OBP is known to forage on a range of exotic weed species within the non-breeding range, several of which are potentially toxic (e.g. Common Heliotrope *Heliotropium europaeum* and Opium Poppy *Papaver somniferum*). Lethal or sub-lethal impacts from consumption of these species and the added risk of exposure to any herbicides used to control weeds, has not been assessed.

The entire known breeding habitat of the Orange-bellied Parrot is protected within the Tasmanian Wilderness World Heritage Area and Southwest Conservation Area. While habitat management burns are prescribed for the enhancement of Orange-bellied Parrot feeding habitat (to create younger aged vegetation), the conservative approach to fires applied by land managers within this breeding area has led to a decline in fire frequency. This in turn may have contributed to a contraction of the breeding range of the species. The only region where the Orange-bellied Parrot frequents in significant numbers is at Melaleuca where fire is regularly used to protect human assets and where a concerted effort has been made to apply fire management prescriptions for the species. The expansion of more frequent firing of sedgeland plains throughout the region is required to provide high quality feeding habitat that the species can recolonise.

### *Invasive weeds*

Invasive weeds impact on OBP foraging habitats throughout the species' non-breeding range. Species of concern include:

- Rice Grass *Spartina anglica*
- Coast Barb-grass *Parapholis incurva*
- Sea Barley-grass *Critesion marinum*
- Marram Grass *Ammophila arenaria*
- Sea Spurge *Euphorbia paralias*
- Boxthorn *Lycium ferocissimum*

These aggressive colonisers are salt-tolerant and have the capacity to swamp native food plants within saltmarshes, coastal herbfields and dune systems. Most are subject to varying degrees of

control in each State, however, a more strategic approach is required to ensure that key OBP sites are effectively targeted.

#### *Introduced predators and competitors*

Although there is a lack of clear evidence that predation of OBPs by European Fox *Vulpes vulpes* and feral Cat *Felis catus* is a serious threat, anecdotal observations suggest there is the potential. Intuitively, the presence and high abundance of these introduced predators at OBP sites must increase the level of mortality and thus limit recovery potential. The introduced European Rabbit *Oryctolagus cuniculus* grazes on saltmarsh and beach-dune vegetation and on weed species, though the impact this has on food availability for OBPs has not been assessed. In the breeding grounds, Common Starlings *Sturnus vulgaris*, Honey Bee *Apis mellifera* and possibly Sugar Glider *Petaurus breviceps* aggressively compete with OBPs for nest hollows and kill incubating females at nest (Mark Holdsworth pers. comm.). However, the extent of this impact is not yet quantified. In each State, the ongoing control of feral predators and competitors in OBP habitat are significant tasks being undertaken at some level by volunteers, local councils, the Department of Defence, Melbourne Water, and State conservation agencies.

The impact of introduced food competitors in the non-breeding range, such as European Goldfinch *Carduelis carduelis*, European Greenfinch *C. chloris* and House Mouse *Mus musculus*, has not been quantified. Control of these species has been proposed to improve the quality and quantity of critical winter habitat (OBPRT 1999) but requires further investigation.

#### *Wind energy developments*

The presences of wind farms, and increasing level of development interest in this renewable energy industry throughout most of the OBPs migratory and winter range, has the potential to significantly impact on the species. While no evidence exists on the propensity for OBPs to collide with turbines, the fact that the species migrates (during the night and day) through a narrow coastal band on which wind farms have been established or are planned, makes the species a candidate for collision risk. The entire OBP population could pass through most of the wind farm sites in western Tasmania whilst on migration. On the mainland, those OBPs that winter west of Cape Otway or in South Gippsland could pass through wind farm sites in those areas. Wind farms sited in and adjacent to important wintering sites (e.g. Yambuk Lake) pose a risk to OBPs commuting between foraging sites, roosting and drinking sites. In addition, direct habitat loss or effective habitat loss (through abandonment of sites due to the presence of turbines) may add to the impact on the species at key sites. Generally, wind farm developers within the OBP range have been required to undertake pre-development bird utilisation studies to determine potential impacts. Where possible turbine layout is adjusted to avoid key migratory or feeding zones to reduce collision risk. At some sites a range of mitigating measures have been tested and/or implemented to further reduce collision risk to the OBP. This has included on site weed control, habitat restoration and provision of supplementary food crops.

The potential impact of each proposed wind farm on the OBP population is assessed individually. Under current provisions individual developments generally can minimise and/or manage potential impacts to the species, however, there is no provision for assessing or regulating cumulative impacts across the entire wind industry. While it is expected most wind farms will kill few OBPs, collectively the industry may have a serious impact. Planning and environmental controls are urgently required to deal with this issue. The Minister for the Environment and Heritage has asked the Australian Government Department of the Environment and Heritage to commission a study to provide information on the cumulative risk of bird strike from windfarms – including the cumulative risk to OBPs.

#### *Psittacine Circoviral Disease*

A significant cause of death among captive OBPs during the breeding program up to 1991 was Psittacine Circoviral Disease (PCD) (Brown 1988). The disease was detected in wild birds in 1993, however, while a significant number of individuals are antibody positive to the disease, there has not been any detected outbreak of the disease. Sub-clinical effects are unknown. Since 1990, mortality due to PCD has been practically eliminated in captive-bred stock through the relocation of the

Hobart facility to a warmer, more sheltered site. Management of this disease will be consistent with the Threat Abatement Plan (AGDEH 2005), which has been made under the provisions of the EPBC Act.

*Illuminated boats and structures*

Anecdotal evidence suggests the bright lights used by squid boats operating in Bass Strait and the Southern Ocean occasionally attract migrating birds, including parrots. This could potentially seriously disrupt OBPs migrating to the mainland and may be influencing survival. Other lit structures such as lighthouses and ships could also pose a similar threat to migrating OBPs. These potential risks require further investigation.

*Trapping*

Currently there are no OBPs in captivity outside the captive-breeding program under the recovery program. Significant powers under State and Commonwealth legislation, combined with the difficulty in trading or selling a species not represented in avicultural collections has probably eliminated trapping of this species. However, the potential risk still exists and State and Commonwealth authorities should remain vigilant.

*Inadequate knowledge of population trends*

Estimating the total size of the OBP population is extremely difficult. The species breed over a wide region within the Tasmanian Wilderness World Heritage Area and Southwest Conservation Area, and locating all nest sites is problematic. Population trends and breeding success is focused on what is believed to be the core breeding population at Melaleuca. During non-breeding the species is widely distributed across four States and recent observations indicates that a wider range of habitats are being favoured. This dispersal makes direct counts impossible. However, increased effort to identify colour-banded individuals within non-breeding habitat will improve the knowledge of survivorship and highlight potential causes of mortality. Refined and effective population studies are important tools for measuring the success (or otherwise) of conservation actions. Population studies should be designed with statistical advice to measure overall population trends and breeding success rather than total size.

*Areas under threat*

Most of the breeding habitat of the OBP is protected within the Tasmanian Wilderness World Heritage Area. However, an unknown proportion of the breeding population may be subject to development pressure within the Southwest Conservation Area, in particular through mineral exploration, mine development and associated infrastructure within the Cape Sorrel to Low Rocky Point region. A variety of habitats and migratory corridors throughout the non-breeding range are under land use and development pressures. Identification and implementation of ecologically sustainable principles at these sites is fundamental to the conservation of the species.

*Populations under threat*

The captive population of OBP is considered to be secure while the entire wild population remains under threat.

## Vision, Objectives, Performance Criteria and Recovery Actions

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### Vision of the Orange-bellied Parrot Recovery Team

*“Our vision is to be able to see large flocks of Orange-bellied Parrots throughout its natural range and to ensure that human impacts no longer place the species under threat of extinction.”*

### Overall objective

The overall objective of the recovery effort is to minimise or eliminate human induced threats in such a manner that the species no longer meets the IUCN criteria for the Critically Endangered category (IUCN 2002) and can be placed in a lower threat category. This will be achieved through:

- a sustainable improvement in the quality and quantity of Orange-bellied Parrot habitat at key sites throughout the range to increase the carrying capacity;
- ensuring that the wild and captive populations of the Orange-bellied Parrot continue to survive beyond the life of this Plan; and
- ensuring that existing and new threats are managed with appropriate measures to ameliorate their impact.

### Specific recovery objectives and criteria

The specific objectives contained within this Plan are:

1. To increase the carrying capacity of habitat through active management of sites throughout the species' range.
2. To identify, measure and ameliorate threats, particularly in migratory and winter habitats.
3. To increase the number of breeding sub-populations.
4. To maintain a viable captive population.
5. To identify all sites used by Orange-bellied Parrots and better understand migration movement.
6. To monitor the population size, productivity, survival and life history of the Orange-bellied Parrot.

The criteria for meeting these objectives are:

- The wild breeding population is increased from approximately 150 to more than 250 individuals.
- The average life expectancy of individuals in the wild population is increased.
- All key sites used by the Orange-bellied Parrot are identified, protected and managed for the species.
- Key threats through the species' range are removed or adequately controlled.
- At least one other viable sub-population in the breeding range is established.
- Public support for the conservation of the Orange-bellied Parrot is increased.
- The captive population contains at least 150 individuals and maintains genetic diversity equivalent to that of the wild population.

Each objective has a range of Recovery Actions that, if implemented, will contribute to achieving these objectives and progress toward attaining our vision.

## Recovery Actions

The Recovery Actions presented here are listed against the specific objectives (above). Each generic action is followed by a number of specific tasks and measurable performance criteria. Organisations and/or individuals with responsibilities for implementation and evaluation are identified. A full list of abbreviations used in this Plan is given in Appendix 1. Where appropriate, actions include an adaptive experimental management approach (AEMA) as recommended in the Major Project Review (Saunders 2002) to test competing hypotheses that underpin management approaches. This will ensure that research and management activity will result in effective and measurable outcomes. Funding and implementation of most actions will be directed through Natural Resource Management (NRM) regions established under the *Framework for the Extension of the Natural Heritage Trust (2002)*. NRM regions are identified against each action as a resource for regional groups to consider for inclusion in their respective strategic plans.

Action	Description	Tasks and Performance Criteria
<i>Specific objective 1 - To monitor the population size, productivity, survival and life history of the Orange-bellied Parrot</i>		
1.1	Undertake observations of banded birds throughout the breeding season (Oct.–Mar.) as a basis to estimating the annual breeding population, survival and longevity of the species. A review of the methodology and statistical robustness of this action is required to confirm that data collected under this action is collected and analysed in the most cost-effective manner. The provision of supplementary seed at Melaleuca will be reviewed annually by the OBPRT and, if deemed appropriate, phased out over the life of this Plan.	<p>1.1.1 Employ a Breeding Season Project Officer (BSPO) in each year of the Plan. The BSPO will also have responsibility for other actions within this Plan including, conducting productivity monitoring, coordinating breeding range surveys, managing the nest box program, implementing the Tasmanian reintroduction program and management of the Tarooma breeding facility. The salary component for this position is split across these associated actions.</p> <p>1.1.2 Employ a recognised ornithological statistician to review population data and, where necessary, redesign the monitoring program to maximise statistical robustness whilst minimising program expenditure.</p> <p>1.1.3 In consultation with the OBPRT produce and implement a breeding season monitoring program annually.</p> <p>1.1.4 Employ Site Coordinators (SC) at Melaleuca and Birchs Inlet to supervise observation activities (Oct.–Mar.) in each year of the Plan. Salary costs for the Birchs Inlet SC are shared with the reintroduction program (5.1).</p> <p>1.1.5 Select, train and provision pairs of volunteers to undertake observation activities on fortnightly shifts (Oct.–Apr.).</p> <p>1.1.6 Undertake observations of birds at Melaleuca and Birchs Inlet.</p> <p>1.1.7 Collate and analyse breeding survey data annually.</p> <p>1.1.8 Report results to the OBPRT annually, and where appropriate, publish results widely.</p> <p>1.1.9 Provide induction for all volunteers.</p>
	<p><b>Responsibilities</b>            Implementation: DPIWE (1.1.1 and 1.1.3), SCs and volunteers (1.1.5), SCs and BSPO (1.1.2, 1.1.4 and 1.1.6 -1.1.9)            Evaluation: RPC and OBPRT            NRM Regions: Cradle Coast &amp; Southern (Tas)</p>	

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria	
1.2	<p>Monitor breeding productivity to assist with population estimates and species' survival estimates. The monitoring program consists of several visits to nests occupied by OBPs throughout the breeding period. This will involve:</p> <ul style="list-style-type: none"> <li>- monitor nest box usage by parrots and other species,</li> <li>- search for natural nests,</li> <li>- determine clutch size, hatching success and fledging success of all nests,</li> <li>- record physical attributes of all nest sites,</li> <li>- attach ABBBS approved colour leg-bands to all nestlings within nest boxes and from natural sites when accessible,</li> <li>- identify parentage (by observing presence of colour banded adults) at all nest sites,</li> <li>- collect blood samples from all banded nestlings for DNA and, when required, PCD analysis,</li> <li>- collect other samples (ie parasites, feather samples, crop samples) as required to support other research projects.</li> </ul> <p><b>Responsibilities</b>  Implementation: DPIWE (1.2.1), BSPO (1.2.2–1.2.3 and 1.2.5–1.2.7), monitoring team (1.2.4)  Evaluation: RPC and OBPRT  NRM Regions: Cradle Coast &amp; Southern (Tas)</p>	1.2.1	Employ a tree climber/s and bird bander to access nest sites and band birds.
		1.2.2	Select and train 4-6 people to undertake monitoring tasks each year. This includes ABBBS authority requirements, data collection, bird handling and occupational health and safety requirements detailed in Action 3.3.
		1.2.3	Undertake inspections as required of all known nests throughout the breeding range.
		1.2.4	Collate and analyse breeding productivity data annually.
		1.2.5	Report results to the OBPRT annually, and where appropriate, publish results in appropriate journals.
		1.2.6	Implement research, monitoring and /or management actions as required under an adopted Psittacine Circoviral Disease Threat Abatement Plan.
1.3	<p>Coordinate surveys of the winter population in late July and monitor the main wintering habitats in May and September. Greater emphasis will be placed on collecting sightings of banded and unbanded birds to improve the robustness of mark-recapture population modelling in the winter range. More frequent observations of colour-banded birds in the winter range will also assist in understanding survival, migration behaviour, foraging requirements and population dynamics. This action will rely heavily on the establishment and activities of regional groups.</p>	1.3.1	Employ a Winter Season Project Officer (WSPO) in each year of the Plan. The WSPO will also have responsibility for maintaining an inventory of winter habitat sites (2.1) and coordinating habitat surveys (2.3).
		1.3.2	Facilitate the formation and operation of a regional group network.
		1.3.3	Develop protocols for regional group operation and provide regular communication through the newsletter (see action 7.3).
		1.3.4	Develop and activate a habitat classification system.
		1.3.5	Develop pocket guide, website information and media material to enhance identification of Neophemas.
		1.3.6	Conduct winter population surveys and searches of new areas as identified by the OBPRT annually.
		1.3.7	Perform a power analysis on count data in first year to determine effectiveness of survey effort and modify methodology as required.
		1.3.8	Collate, enter and analyse winter count and banding data annually.

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
<b>1.3</b> <i>cont.</i>	<p><b>Responsibilities</b> Implementation: DSE (1.3.1), WSPO (1.3.2–1.3.12) Evaluation: RPC and OBPRT NRM Regions: All SA, Vic and NSW, Cradle Coast (Tas)</p>	<p>1.3.9 Report results of winter population surveys to the OBPRT annually, and where appropriate, publish results in appropriate reports or journals.</p> <p>1.3.10 Communicate results of winter surveys through TUC and other relevant media.</p> <p>1.3.11 Conduct training sessions for volunteers and regional groups annually. This will be conducted in conjunction with the Threatened Bird Network and other volunteer organisations in each State. Delivery of this action will include field orientation days, distribution of educational material, accreditation of OBP identification skills and volunteer feedback.</p> <p>1.3.12 Attend all winter range regional group meetings.</p>
<b>1.4</b>	<p>Investigate the relationship between climatic variation, migration and breeding success across years</p> <p><b>Responsibilities</b> Implementation: BSPO, DPIWE Evaluation: OBPRT NRM Regions: NA</p>	<p>1.4.1 Undertake an analysis of climatic and breeding data in 2005.</p>
<i>Specific objective 2 - To identify all sites used by Orange-bellied Parrots and better understand migration movements</i>		
<b>2.1</b>	<p>Develop a GIS site register of all historic and current OBP habitats. The GIS data will be analysed to determine if causes of population decline or spatial change can be attributed to particular management regimes or threats.</p> <p><b>Responsibilities</b> Implementation: DSE (2.1.1), WSPO, BSPO and conservation agencies of each State (2.1.2–2.1.8). Evaluation: OBPRT NRM Regions: All</p>	<p>2.2.1 Produce 1:25,000 (or better) vegetation maps for entire OBP range by 2005.</p> <p>2.2.2 Develop and distribute a site register of OBP locations by 2006.</p> <p>2.2.3 Conduct site audits to determine status and change.</p> <p>2.2.4 Update the site register in each year of the Plan.</p> <p>2.2.5 Analyse GIS data to determine influences on population dynamics.</p> <p>2.2.6 Provide conservation agencies with habitat information to guide land management practices.</p> <p>2.2.7 Publish results of GIS data analysis and implementation of results.</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
2.2	<p>Undertake surveys for OBPs within non-breeding habitat to understand the daily and seasonal use of habitats, identify known and potential food plants, proximity of potential roost sites, identify threats and stimulate management of OBP resources on private and public lands.</p> <p><b>Responsibilities</b>            Implementation: DSE (2.3.1), WSPO (2.3.2–2.3.4)            Evaluation: RPC and OBPRT            NRM Regions: All Vic, SA and NSW, Cradle Coast (Tas)</p>	<p>2.2.1 Conduct winter surveys and habitat searches as identified by the OBPRT annually.</p> <p>2.2.2 Based on survey results, provide information to land managers on habitat use and conservation.</p> <p>2.2.3 Report results of winter surveys to the OBPRT annually.</p>
2.3	<p>Undertake surveys of the breeding population in the first and last year of the Plan to measure any changes (contraction or expansion) in the breeding range of the species.</p> <p><b>Responsibilities</b>            Implementation: DPIWE (2.4.1), BSPO (2.4.2, 2.4.5 and 2.4.6), BSPO and survey teams (2.4.3 and 2.4.4)            Evaluation: RPC and OBPRT            NRM Regions: Cradle Coast &amp; Southern (Tas)</p>	<p>2.3.1 Provide appropriate training of all personnel. This will include wilderness first aid, radio operations and helicopter safety.</p> <p>2.3.2 Undertake a major survey of all potential breeding habitats in 2005/06 and 2008/09.</p> <p>2.3.3 Undertake targeted surveys at key sites in 2005/06, 2006/07 and 2007/08.</p> <p>2.3.4 Collate and analyse survey results annually.</p> <p>2.3.5 Report results of survey to the OBPRT annually.</p>
2.4	<p>Develop search methods and innovative techniques to identify key sites and measure migration behaviour. Details of flight heights, flight corridors, air speed and non-stop <i>versus</i> staged movements are required to better inform decision-makers particularly in relation to wind energy developments. Search methods will be developed to measure variables during surveys within the non-breeding range (see actions 1.3 and 2.2). Research and development of an automated acoustic monitoring systems (AAMS) will be undertaken under this action.</p> <p><b>Responsibilities</b>            Implementation: DPIWE            Evaluation: RPC and OBPRT            NRM Regions: All</p>	<p>2.4.1 Undertake a review of the available technologies to assist with measuring OBP movements in 2005.</p> <p>2.4.2 Based on 2004 field trials, refine and automate the AAMS by 2005.</p> <p>2.4.3 Report the results of the field trials and development to the OBPRT by 2005.</p> <p>2.4.4 Develop and fund a deployment schedule for targeted AAMS by the end of 2005.</p> <p>2.4.5 Deploy AAMS and report results annually to the OBPRT.</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
<i>Specific Objective 3 - To increase the carrying capacity of habitat through active management of sites throughout the species' range</i>		
3.1	<p>Review implementation and effectiveness of management plans to protect OBP resources throughout the breeding and non-breeding range. Agencies responsible for developing and implementing these plans will be informed of the locations of known and potential OBP habitats through the site register (Action 2.1) and informed of review outcomes.</p> <p><b>Responsibilities</b> Implementation: WSPO and State agencies Evaluation: OBPRT NRM Regions: All</p>	<p>3.2.1 Employ a project officer to review and report on the effectiveness of conservation measures in all existing management plans throughout the range by 2006.</p> <p>3.2.2 Ensure that OBP requirements are integrated into all new management plans throughout the range.</p> <p>3.2.3 Monitor management plan development and make submissions as required.</p>
3.2	<p>Maintain foraging habitat at breeding sites through appropriate fire management. Habitat management burns will be conducted between April and September (when OBPs are absent) every year within the breeding range, in accordance with the PWS regional fire management plans and in consultation with DPIWE Nature Conservation Branch staff. A detailed study of the usage of vegetation age classes by OBP is required. This study will be undertaken as a component of a higher degree research to investigate fire ecology of buttongrass moorlands in the World Heritage Area.</p> <p><b>Responsibilities</b> Implementation: PWS (3.2.1), BSPO and RPC (3.2.2), BSPO (3.2.3), post-graduate student (3.2.4) Evaluation: OBPRT and RPC NRM Regions: Cradle Coast &amp; Southern (Tas)</p>	<p>3.2.4 Undertake annual patch burning around known and potential OBP breeding sites in accordance with regional fire management plans.</p> <p>3.2.5 Develop experimental design and methodology for a higher degree research program to investigate fire ecology in 2005/06.</p> <p>3.2.6 Monitor feeding dispersal across vegetation age classes at Melaleuca, and the plant species being utilised in each year of the Plan. The data will be made available to above study.</p> <p>3.2.7 Undertake fire ecology study of buttongrass moorlands (including OBP values) by 2005.</p>
3.3	<p>Provide, maintain and monitor nest boxes to allow ease of colour banding, monitoring of productivity and to monitor/control competitors. Common Starlings, Honeybees and Sugar Gliders can aggressively compete with OBPs for nests. Common Starling and Honeybee populations will be controlled where this occurs. Further work is required to determine the level of impact from Sugar Gliders. The provision of nest boxes will be reviewed annually by the OBPRT and, if deemed appropriate, phased out over the life of this Plan.</p> <p><b>Responsibilities</b> Implementation: DPIWE (3.3.1 and 3.3.5), BSPO (3.3.2–3.3.3), nest box maintenance team (3.3.4) Evaluation: RPC NRM Regions: Cradle Coast &amp; Southern (Tas)</p>	<p>3.3.1 Employ a professional tree climber to access nest sites.</p> <p>3.3.2 Train other DPIWE staff and/or volunteers in the skills necessary to continue the provision of nest boxes annually. This will include wilderness first aid, radio operations, helicopter safety and tree climbing techniques.</p> <p>3.3.3 Continue to provide, maintain and monitor up to 150 nest boxes at Melaleuca, Birchs Inlet, Noyhener and Towterer Creek for the life of the Plan.</p> <p>3.3.4 Undertake control measures for introduced competitors as required</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria	
3.4	<p>Manage migratory habitat in Tasmania. Significant areas of heathland, coastal scrub and saltmarsh along the west and northwest of Tasmania are used for the grazing of livestock. While quantitative data of the effect of grazing are not yet available, empirical observations at sensitive habitats and limited seed availability during low productive years clearly indicate a negative impact on OBP resources. Foraging sites within the Arthur-Pieman Conservation Area (APCA), Hunter Island, West Kangaroo Island and Perkins Island require immediate attention. Other sites within the region, including freehold tenures on King Island, require further investigation. A comprehensive review of grazing practices on coastal lands will be conducted to guide management of Crown Lands.</p> <p><b>Responsibilities</b>            Implementation: PWS (3.4.1 and 3.4.3), DPIWE (3.4.2, 3.4.4 and 3.4.6)            Evaluation: PWS and RPC            NRM Regions: Cradle Coast (Tas)</p>	3.4.1 3.4.2 3.4.3 3.4.4 3.4.5 3.4.6	<p>Exclude stock from key habitats within the APCA, Hunter Island, Perkins Island and West Kangaroo Island in 2005.</p> <p>Identify other sites where grazing should be excluded or modified.</p> <p>Undertake a study of grazing practices and impacts on conservation values on coastal lands throughout Tasmania (including King Island).</p> <p>Implement recommendations from 3.4.2 and 3.4.3 and integrate within grazing management guidelines and leases.</p> <p>Monitor vegetation and OBP usage in response to changed stock management on an on-going basis.</p> <p>Publish results of changed land management practices.</p>
3.5	<p>Provide additional foraging and roosting habitat at sites throughout the non-breeding range using innovative techniques. This will include providing additional habitat through a range of trials to establish what attracts or retains OBPs, then to implement results at targeted key sites. The results of habitat creation experiments will be conducted using AEMA and incorporated into existing and new management plans under Action 3.1. Where OBP sites exist on private land, landowners will be consulted with the aim of producing and implementing management agreements. Landowners will be encouraged and, where necessary, assisted in applying for funds to undertake OBP conservation on their land. The nutritional suitability of different food crops and planting strategies will be tested. Experimental food crops will be planted and maintained adjacent to the Spit Nature Conservation Reserve (on Melbourne Water land), Lake Connewarre State Game Reserve (on private land), Yambuk Lake (on private land) and Piccaninnie Ponds Conservation Park (on private land). The saltmarsh revegetation plan for the Werribee River mouth (Murphy 2001) will be implemented. The methodology and results of this revegetation plan will be applied to other sites, particularly in western Port Phillip Bay and the Bellarine Peninsula. Negotiations will be instigated to ensure that saltmarsh revegetation will be undertaken during the decommissioning of parts of the Western Treatment Plant.</p> <p><b>Responsibilities</b>            Implementation: DEH and DSE (3.5.1), Extension Officer (3.5.2–3.5.6)            Evaluation: OBPRT and RPC            NRM Regions: All winter regions</p>	3.5.1 3.5.2 3.5.3 3.5.4 3.5.5 3.5.6 3.5.7	<p>Employ an Extension Officer to oversee all habitat management activities in 2005.</p> <p>Investigate and report on nutritional suitability of food crops by 2006.</p> <p>Undertake a trial planting of food crops adjacent to key wintering sites by 2006.</p> <p>Undertake experimental saltmarsh revegetation on at least one site within the core wintering range in each year of the Plan.</p> <p>Document and report annually on the results of winter habitat management/ creation, and publish the results.</p> <p>Monitor the health of natural and experimental saltmarsh sites using fixed photopoints and habitat description transects throughout the life of this Plan. Incorporate photographic records into the site register database (see action 2.1).</p> <p>Develop, fund and implement a winter habitat revegetation plan by 2007. The plan will aim to establish a chain of managed sites between key sites, no further than 50km apart. This will include the publication and distribution of a “how to guide” for the establishing saltmarsh and other OBP habitats</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
3.6	<p>The suitability of unoccupied winter habitat and revegetation programs will be tested through the release of captive-bred birds as required. The experience gained from releases in Tasmania and at Point Wilson will be used to develop a release protocol for experimental releases on the mainland.</p> <p><b>Responsibilities</b> Implementation: DSE Evaluation: OBPR NRM Regions: All Vic</p>	<p>3.3.1 Develop a protocol for a release program of captive-bred birds on the mainland by 2006.</p> <p>3.3.2 Select at least two managed wintering sites and undertake a release of captive-bred birds by 2005.</p> <p>3.3.3 Analyse and incorporate results into other actions as required, and report results.</p>
3.7	<p>Conduct trial of impact of grazing by sheep on the upper saltmarsh, Spit Nature Conservation Reserve. Funding for this study is provided from the OBP Trust Fund established by Hydro Tasmania to contribute to conservation of the species to offset potential impacts of the Woolnorth wind farm (northwest Tas).</p> <p><b>Responsibilities</b> Implementation: DSE Evaluation: OBPR, Arthur Rylah Institute for Environmental Research NRM Region: Port Phillip and Western Port</p>	<p>3.7.1 Conduct a study into the effect of grazing on the floristics of saltmarsh vegetation, and report results.</p> <p>3.7.2 Implement results of trial if grazing proves to be effective.</p>
<i>Specific Objective 4 - To identify, measure and ameliorate threats, particularly in migratory and winter habitats</i>		
4.1	<p>Monitor human activity at the Western Treatment Plant (WTP), The Spit Nature Conservation Reserve and Swan Island. Develop prescriptions to minimise disturbance of OBPs and protect fragile habitats. Consideration will be given to establishing a system of volunteer guides to accompany birdwatchers to observe OBPs. This will provide an opportunity to educate visitors about the recovery effort, identification of Neophemas and, potentially, recruit observers to assist with winter surveys.</p> <p><b>Responsibilities</b> Implementation: WSP (4.1.1, 4.1.3), DSE, Parks Victoria, Melbourne Water and Department of Defence (4.1.2) Evaluation: OBPR NRM Region: Port Phillip and Western Port</p>	<p>4.1.1 During 2005 assess trend in golfer numbers versus trend in OBP numbers at Swan Island.</p> <p>4.1.2 Continue with permit system for access to SNCR and Swan Island.</p> <p>4.1.3 In conjunction with the new access policy to the Western Treatment Plant, examine potential for visitor/volunteer tours to WTP by 2005.</p>
4.2	<p>Continue to provide advice to proponents on the issues relating to collision risk and OBP conservation values at proposed wind farm sites throughout the range, particularly migratory corridors and winter habitats. Develop guidelines to aid risk assessment, wind farm site selection and micro siting of turbines.</p>	<p>4.2.1 Produce and distribute a detailed map of OBP distribution in relation to wind energy resource in 2005.</p> <p>4.2.2 Develop mechanisms to ensure that all wind farm proponents and associates are aware of OBP conservation issues by 2005.</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
4.2 cont.	<p><b>Responsibilities</b> Implementation: Windfarm Working Group (4.2.1, 4.2.3–4.2.5), State planning agencies (4.2.2), OBPRT (4.2.5) Evaluation: OBPRT and AGDEH NRM Regions: All</p>	<p>4.2.3 Develop environmental assessment and management guidelines for assessment of the impact and degree of significance of wind farm proposals on OBPs and their habitat.</p> <p>4.2.4 Identify areas of importance to OBPs for siting wind farm developments</p> <p>4.2.5 Develop dead bird search methodology for OBP and communicate with regulatory authorities and industry.</p>
4.3	<p>In consultation with squid boat operators and Australian Fisheries Management Authority (AFMA) assess the impact of the squid fishery on the OBP within the western Bass Strait migration corridor and develop mitigation measures as required. Identify all other lit structures within the migratory corridor and assess the potential impact on OBP.</p> <p><b>Responsibilities</b> Implementation: AFMA, RPC Evaluation: AFMA, OBPRT NRM Regions: NA</p>	<p>4.3.1 Determine whether migrating parrots are attracted to squid boats by 2005.</p> <p>4.3.2 If squid boats are found to pose a potential threat, develop mitigation measures to reduce this threat by 2007.</p> <p>4.3.3 Identify all lit structures within OBP migratory corridors and develop a long term monitoring program to determine impact potential by 2005.</p>
4.4	<p>Undertake control programs of cats and foxes at key OBP sites using AEMA. The effectiveness of control measures, such as poison programs, trapping, shooting, fence exclusions and pet control will be measured and the results applied for greatest benefit. Experimental design will focus on the abundance of analogue prey species populations and the relative composition of these species in prey remains and scats. Such studies could be undertaken as a project through a tertiary institution (see Action 9.2).</p> <p>Restructure the cat control program on King Island with a more rigorous experimental design to measure the effectiveness of control measures. King Island has the potential to apply broader cat control measures that deal not only with the feral cat population but also the domestic source through strategic community based cat control programs.</p> <p><b>Responsibilities</b> Implementation: PWS, PV and DEH Evaluation: PWS, DSE and DEH NRM Regions: All</p>	<p>4.4.1 Review cat and fox control programs in each State to determine target areas and where possible redirect efforts to key OBP sites.</p> <p>4.4.2 Where targeted control programs are established, ensure that a rigorous AEMA is applied.</p> <p>4.4.3 Based on the results of AEMA continually adjust and refine predator control programs throughout the range.</p> <p>4.4.4 Develop research projects in conjunction with control programs to quantify the predation level on OBPs and the effectiveness of control measures in reducing.</p> <p>4.4.5 Encourage the application of strategic, community based cat control programs on King Island.</p>
4.5	<p>Undertake studies to determine the level of competition from introduced finches on OBP food resources within the non-breeding range. This action is suitable as a post-graduate project. (see Action 9.2).</p> <p><b>Responsibilities</b> Implementation: RPC Evaluation: OBPRT NRM Regions: NA</p>	<p>4.5.1 Examine introduced finch and OBP foraging behaviour and through focal observations. Compare food resources used and report.</p> <p>4.5.2 Where significant competition is detected, implement control programs at key sites.</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
4.6	<p>Control the spread of introduced invasive plants at key OBP sites. This includes:</p> <ul style="list-style-type: none"> <li>• Rice Grass <i>Spartina anglica</i> (Anderson's Inlet (Vic), Barwon River estuary (Vic) and Robbins Passage (Tas).</li> <li>• Boxthorn <i>Lycium ferocissimum</i> (The Spit NCR (Vic))</li> <li>• Marram Grass <i>Ammophila arenaria</i> (Tasmanian Wilderness World Heritage Area)</li> <li>• Sea Spurge <i>Euphorbia paralias</i> (west coast and Bass Strait islands (Tasmania))</li> </ul> <p>Prescriptions for the control of other species (e.g. Coast Barb-grass <i>Parapholis incurva</i>, Sea Barley-grass <i>Critesion marinum</i>) and at other sites will be developed. This will include the management of cattle grazing, fire and human activities that exacerbate the spread of invasive weeds.</p> <p><b>Responsibilities</b> Implementation: State agencies Evaluation: State agencies NRM Region: All</p>	<p>4.6.1 Use the site register database to identify priority weed infestations.</p> <p>4.6.2 Develop site based control programs and engage land managers and volunteer groups in control programs.</p> <p>4.6.3 Monitor the effectiveness of weed control efforts and the impact on saltmarsh resources.</p>
4.7	<p>Review, refine and run a Population Viability Analysis (PVA) to assess the impacts of threats to the species. In particular, the cumulative effects of the risk of collisions for all wind farms will be modelled.</p> <p><b>Responsibilities</b> Implementation: AGDEH Evaluation: OBPR T NRM Regions: NA</p>	<p>4.7.1 Review the assumptions of the Drechsler and consider conducting a PVA using RAMAS Metapop. model in 2005.</p> <p>4.7.2 Provide current data on population dynamics for inclusion in the refined PVA model in 2005.</p> <p>4.7.3 Model the cumulative effects of the risk of collisions for all wind farm proposals in 2006. (Note - The Minister for the Environment and Heritage has asked the Australian Government Department of the Environment and Heritage to commission a study to provide information on the cumulative risk of bird strike from windfarms – including cumulative risk to OBPs)</p>
4.8	<p>Monitor aircraft and other visitor activity at Melaleuca and develop prescriptions to ensure that human activity does not impact on OBP values.</p> <p><b>Responsibilities</b> Implementation: PWS Evaluation: DPIWE, OBPR T NRM Region: Southern (Tas)</p>	<p>4.1.1 Monitor the number of flights and visitors to Melaleuca and report annually.</p> <p>4.1.1 Develop a monitoring program that ensures that negative impacts on OBPs are measured and action taken to ameliorate those impacts.</p> <p>4.1.2 Instigate measures that will enable greater management control over the number/type of aircraft and visitors to Melaleuca on an on-going basis.</p> <p>4.1.3 Develop and promote a code of conduct for visitors and commercial companies operating at Melaleuca on an on-going basis</p>

## Recovery actions cont.

Action	Description	Tasks and Performance Criteria
<i>Specific Objective 5 – To increase the number of breeding sub-populations /groups</i>		
5.1	<p>Implement, monitor and review the reintroduction of the OBP at Birchs Inlet. As required, excess birds from the captive-breeding program will be made available for release at Birchs Inlet. This action relies heavily on the involvement of volunteers to assist with husbandry of birds and monitoring studies. The success of this action is also reliant on the continued management of the breeding habitat, in particular, fire management, Common Starling and Honeybee control. Further work is required to determine the influence of Sugar Gliders on the reproductive success on the OBP at this and other sites.</p> <p><b>Responsibilities</b> Implementation: DPIWE (5.1.1), BSPO (5.1.2–5.1.3, 5.1.6–5.1.8), PWS (5.1.4), SC and volunteers (5.1.5) Evaluation: RPC, OBPR NRM Region: Cradle Coast (Tas)</p>	<p>5.1.1 In consultation with the OBPR review the effectiveness of the release program each year and as required undertake release and monitoring programs annually.</p> <p>5.1.2 Employ a Site Coordinator to supervise release activities in each year of the Plan.</p> <p>5.1.3 Select, train and provision at least 2 volunteers per fortnight shift to undertake release activities from October to April.</p> <p>5.1.4 Undertake and monitor releases of captive-bred OBPs at Birchs Inlet for each year of the Plan.</p> <p>5.1.5 Report results to the OBPR annually.</p> <p>5.1.6 Ensure on-going management activities to maintain adequate breeding, foraging and roosting habitat.</p> <p>5.1.7 Monitor the impact of introduced nest competitors and implement control measures to reduce these impacts.</p>
5.2	<p>Assess the potential and efficacy of reintroduction of the OBP at other areas within the breeding range including Nye Bay, Noyhener Beach, Towterer Beach and Southport Lagoon. The assessment will consider nest site availability and competitors, foraging habitat quality and cost effectiveness of reintroduction.</p> <p><b>Responsibilities</b> Implementation: DPIWE (5.2.1), BSPO (5.2.2–5.2.3) Evaluation: RPC NRM Regions: Cradle Coast &amp; Southern (Tas)</p>	<p>5.2.1 Employ a BSPO in each year of the Plan (see 1.1).</p> <p>5.2.2 Undertake an assessment of other sites in southwest Tasmania for release of captive-bred birds in 2005.</p> <p>5.2.3 Based on 5.2.2 and if deemed appropriate undertake alternative reintroduction program.</p>
<i>Specific Objective 6 – To maintain a viable captive population</i>		
6.1	<p>Manage a captive population of at least 150 individuals at all existing facilities. This action will ensure that sufficient birds are produced to supply the requirements of the reintroduction program and winter habitat experimental management whilst maintaining a captive population.</p> <p>Successful implementation of this action is reliant on the cooperation and assistance of partner institutions. The Captive Management Group (CMG) will oversee the implementation of husbandry and captive management processes. A significant component of the captive-breeding program is conducted by volunteers who undertake daily care of captive birds.</p>	<p>6.1.1 Employ a Captive Management Coordinator for the life of the Plan.</p> <p>6.1.2 Manage, report and review operation of the captive-breeding program.</p> <p>6.1.3 Develop a Captive Management Strategy by 2006.</p> <p>6.1.4 Develop an OBP Husbandry Manual by 2005.</p> <p>6.1.5 Develop a contingency plan for emergency evacuation of birds from each facility by 2006.</p> <p>6.1.6 Implement research, monitoring and /or management actions as required under an adopted PCD Threat Abatement Plan.</p>

Recovery actions cont.

Action	Description	Tasks and Performance Criteria
<p><b>6.1</b> <i>cont.</i></p>	<p>Resources are required to feed birds, operate and maintain aviaries, supply nest boxes, maintain security and provide veterinary care.</p> <p><b>Responsibilities</b> Implementation: DPIWE, HS and AZ (6.1.1-6.1.2, 6.1.7-6.1.11), CMC (6.1.3–6.1.6) Evaluation: CMG NRM Regions: NA</p>	<p>6.1.7 Maintain captive breeding facilities at Taroona, Healesville Sanctuary, and Adelaide Zoo and appropriate private holdings for the life of this Plan.</p> <p>6.1.8 Maintain a captive population of at least 150 individuals.</p> <p>6.1.9 Produce at least 30 individuals for release into the wild each year.</p> <p>6.1.10 Produce sufficient individuals for release as part of winter habitat experimental management.</p> <p>6.1.11 Increase the average productivity to at least 2 fledglings per female.</p>
<p><b>6.2</b></p>	<p>Monitor and manage the genetic diversity of the captive population to ensure that the captive population is representative of the wild genotype. If a decline in the heterozygosity of the wild population is detected, the potential exists for selective release of captive birds to redress this imbalance. Founder stock may need to be collected occasionally in order to maintain genetic diversity within the captive population. It is also important, particularly for managing the captive-stock and the release program, to determine actual sex of individuals at an early stage. This will be done using DNA-based sexing techniques. Research under this action could be done through a stipend for a post-graduate study (see Action 9.2).</p> <p><b>Responsibilities</b> Implementation: Commercial genetics laboratory (6.2.1, 6.2.3), DPIWE, DSE, SA AGDEH (6.2.2) Evaluation: CMG NRM Regions: NA</p>	<p>6.2.1 Develop a method for monitoring the heterozygosity of the wild population.</p> <p>6.2.2 Obtain approvals to acquire new founder individuals from the wild as required.</p> <p>6.2.3 Undertake DNA-based sexing annually and report to the CMG and OBPR.</p>

## Supporting Actions

The successful implementation of the Recovery Actions will require a range of Supporting Actions as described below.

Action	Description	Tasks and Performance Criteria
<i>Supporting Action 7 – Foster community support and involvement in the conservation and recovery of the species and its habitat</i>		
7.1	<p>Develop and maintain communication pathways to meet the needs of stakeholders and the broader community. This will be achieved through a variety of means and may vary according to the needs of particular community groups or stakeholders. An analysis of the needs of stakeholders will be conducted. A multi-media CD-ROM and website based interpretive package will be produced to more effectively disseminate information to all stakeholders and the general community. This will include biological information, conservation significance, recovery actions and identification tools. Where a specific need is identified hard copy information may also be produced. In order to stimulate interest in the OBP and advocacy of the recovery effort, it is important that opportunities be made available for all stakeholders and the general public to see the OBP and the recovery effort. This may include observation of birds throughout the range during organised field days, assistance with banding program or release of captive-bred birds.</p> <p><b>Responsibilities</b> Implementation: RPC Evaluation: RPC NRM Regions: All</p>	<p>7.1.1 Commission market research into the needs of stakeholders in 2005. This will include surveys of landowners throughout the OBPs range to determine awareness barriers.</p> <p>7.1.2 Develop an action plan for community and stakeholder involvement based on the results of 7.1.1.</p> <p>7.1.1 Secure funding and implement recommendation within the stakeholder strategy.</p> <p>7.1.2 Produce a multi-media interpretive package in 2005.</p> <p>7.1.3 Maintain and regularly update the OBP website.</p> <p>7.1.4 Develop a portable interpretive display for OBP promotion and publicity.</p> <p>7.1.5 Develop and implement a program of site visits and activities for key stakeholders and media annually.</p>
7.2	<p>Support existing and establish new OBP regional groups throughout the range with particular emphasis on non-breeding regions. Natural Resource Management groups throughout the species' range will play an important role in facilitating, supporting and, in some cases, resourcing these regional groups.</p> <p>A core task of regional groups is to hold field days to provide information to local landowners and managers as well as provide a forum for training volunteers in observation techniques.</p> <p><b>Responsibilities</b> Implementation: RPC (7.2.1), DSE and WSPO (7.2.2 a-b), DEH and WSPO (7.2.2 c), DPIWE and BSPO (7.2.2 d-e), NSW NPWS and WSPO (7.2.2 f) Evaluation: RPC and OBPR NRM Regions: All</p>	<p>7.2.1 Support the activities of the South Australian and , Western Victoria Working Groups and new groups as they are formed.</p> <p>7.2.2 Establish regional groups by 2005 at:</p> <ol style="list-style-type: none"> <li>Western Port (Vic)</li> <li>Bellarine Peninsula (Vic)</li> <li>Coorong (SA)</li> <li>King Island (Tas)</li> <li>North-western Tasmania</li> <li>South coast (NSW)</li> </ol> <p>7.2.4 Identify gaps and target key individuals for the formation of new regional groups.</p> <p>7.2.5 Each regional group will conduct field days and volunteer training sessions at least once per year.</p>
7.3	<p>Produce a recovery program newsletter <i>Trumped-up Corella</i> (TUC) and circulate more frequently than was achieved under the previous plan. A volunteer editor, appointed on an annual basis, will coordinate production of TUC on the OBP website, circulate via email</p>	<p>7.3.1 Secure the services of a suitably qualified volunteer editor of TUC in 2005.</p>

*Supporting actions cont.*

Action	Description	Tasks and Performance Criteria	
7.3 <i>cont.</i>	<p>and hard copies as required. Resources for design, publication and circulation will be secured from sponsorship sources and all regional groups will be requested to provide articles through sub-editors in those groups.</p> <p><b>Responsibilities</b> Implementation: WSPO (7.3.1–7.3.2), TUC editor (7.3.2–7.3.4) Evaluation: OBPRT NRM Regions: NA</p>	7.3.2  7.3.3 7.3.4	<p>Appoint sub-editors from regional and captive management groups to provide regular articles for inclusion in TUC in 2005.</p> <p>Produce two hard copy editions of TUC each year.</p> <p>Publish a PDF version of TUC on the OBP website and associated web links.</p>
7.4	<p>Coordinate volunteer involvement in the recovery program through the provision of advice and support. An activities program will be produced to encourage and manage volunteers. This will be used to communicate volunteer opportunities through volunteer organisation networks. Project officers and regional groups will play a key role in coordinating these efforts and raising community awareness.</p> <p>The success of volunteer involvement is dependent on providing a safe working environment and rewarding experience. Volunteer selection, training, supervision, provisioning and feedback are all-important aspects of volunteer coordination and require attention under this action.</p> <p><b>Responsibilities</b> Implementation: TBN (7.4.1–7.4.2), all project managers (7.4.3–7.4.4) Evaluation: OBPRT NRM Regions: NA</p>	7.4.1 7.4.2  7.4.3  7.4.4	<p>Develop and distribute a volunteer activities program annually.</p> <p>Liaise (on an ongoing basis) with volunteer organisations and project managers on the coordination and support of the volunteer activities program.</p> <p>Provide a safe work environment and a rewarding experience for all volunteers.</p> <p>Monitor and report on volunteer activities and effort.</p>
<i>Supporting Action 8 – Develop and implement a Recovery Fund Plan</i>			
8.1	<p>Develop and implement a Recovery Fund Plan (RFP) with the aim to secure funds on a partnership basis from governments, private donors and corporate sponsors. A key component of the RFP will be identification of sponsorship marketing opportunities. The RFP will identify all tasks within this Plan that are not capable of being funded through government sources. These will be incorporated into sponsorship marketing packages, tailored to appeal to a range of sponsorship levels. The sponsorship component of the RFP will identify corporate neighbours who could contribute to recovery program tasks. This is particularly relevant to a number of industries in the Port Phillip Bay region. The RFP will also identify Ecological Trusts and other funding bodies for support of finite projects within this Plan.</p>	8.1.1 8.1.2 8.1.3  8.1.4	<p>Members of the OBPRT form a sub-group to oversee the development of a Recovery Fund Plan (RFP) in 2005.</p> <p>Advertise for expressions of interest for donor and/or corporate support within all major Australian newspapers and other forums in 2005.</p> <p>Produce an RFP, including a marketing plan to identify potential sponsorship opportunities, and marketable sponsorship 'packages' aimed at attracting a range of sponsorship levels and regional sponsorship opportunities. Tax deductibility for gifts, bequests and sponsorships will be clearly set out within the RFP.</p> <p>Implement the RFP over the life of this Plan and review in 2007.</p>

## Supporting actions cont.

Action	Description	Tasks and Performance Criteria	
8.1 <i>cont.</i>	<p>A fundraising person is required to assist the OBPRT to develop the RFP within the first year of this Plan. This may involve the costs of employing a professional fundraising adviser or the provision of corporation staff to develop the RFP.</p> <p><b>Responsibilities</b> Implementation: OBPRT (8.1.1 and 8.1.4), DPIWE (8.1.2), consultant (8.1.3) Evaluation: RPC, OBPRT NRM Regions: NA</p>		
8.2	<p>Based on the actions within this Plan develop and distribute a program to foster collaborative research activities at tertiary institutions. Successful implementation of this Plan will rely on the continued involvement and establishment of partnerships with these and other institutions.</p> <p><b>Responsibilities</b> Implementation: RPC Evaluation: OBPRT and RPC NRM Regions: NA</p>	8.2.1 8.2.2 8.2.3	<p>Develop a list of priority research, which can be done by tertiary students</p> <p>Develop and distribute a tertiary institution partnership research program by 2006.</p> <p>Liaise (on an ongoing basis) with university research managers about the implementation of the research program and assist with funding applications.</p>
<i>Supporting Action 9 – Manage, review and report on the recovery process</i>			
9.1	<p>Maintain an effective Recovery Team that organises, implements, reviews and reports on the recovery effort. The OBPRT will meet at least annually in one of the three range states on a rotational basis (Tas (2005, 2008) SA (2006, 2009) Vic (2007)). Special meetings and/or phone conferences will be conducted as required.</p> <p><b>Responsibilities</b> Implementation: The Chair of the OBPRT (9.1.1–9.1.4), OBPRT (9.1.5) Evaluation: OBPRT NRM Regions: NA</p>	9.1.1 9.1.2 9.1.3 9.1.4	<p>The OBPRT physically meets at least once per year (circa May) on a rotational basis in each of the range states.</p> <p>The OBPRT holds extraordinary meetings to address conservation, program management and funding issues as is necessary.</p> <p>Minutes of all such meetings are produced in a timely manner.</p> <p>Progress of implementation of this Plan is reviewed annually and amended as required.</p>
9.2	<p>Maintain recovery program coordination through the appointment of a Recovery Program Coordinator (RPC). The RPC will report directly to the OBPRT through its Chair and ensure that OBPRT members fulfil their agreed responsibilities. The position includes liaison with appropriate government agencies, non-government organisations, OBP regional groups, Natural Resource Management regional groups and other stakeholders as is necessary. The framework for implementation of the Natural Heritage Trust objectives and the Recovery Plan will guide this. The tasks of the RPC include:</p> <ul style="list-style-type: none"> <li>• Identify management and conservation issues and communicate these to relevant people.</li> <li>• Coordinate the submission of grant applications and cooperative proposals to support the recovery process.</li> </ul>	9.2.1 9.2.2 9.2.3 9.2.4 9.2.5	<p>In the first year of this Plan, investigate and report on the feasibility of sharing aspects of the RPC position with another recovery program.</p> <p>In the second year of the Plan appoint an RPC for the life of the Plan.</p> <p>Develop an annual implementation plan and reporting structure.</p> <p>Coordinate implementation of Recovery Plan actions in each year.</p> <p>Report and review implementation as required.</p>

Supporting actions cont.

Action	Description	Tasks and Performance Criteria
<p><b>9.2</b> <i>cont.</i></p>	<ul style="list-style-type: none"> <li>• Facilitate the collation and analysis of data and its publication.</li> <li>• Facilitate implementation of high priority actions in each range State.</li> <li>• Develop and review timelines for the completion of actions.</li> <li>• Report regularly to the OBPRT.</li> </ul> <p>The RPC will have the flexibility to allow strategic thinking, address issues across all States, and integrate tasks done by government departments and regional groups. The RPC, possibly a retired person, will be employed on a nominal retainer.</p> <p><b>Responsibilities</b> Implementation: OBPRT (9.2.1–9.2.2), RPC (9.2.3–9.2.5) Evaluation: OBPRT and RPC NRM Regions: NA</p>	
<p><b>9.3</b></p>	<p>Review State and Commonwealth listings of the species to reflect current knowledge and listing criterion. Similarly, all State and Commonwealth authorities should identify and make management provisions for critical habitats under their respective jurisdictions.</p> <p><b>Responsibilities</b> Implementation: Recovery Team and AGDEH (9.3.1), all State agencies (9.3.2–9.3.4) Evaluation: OBPRT and RPC NRM Regions: All</p>	<p>9.3.1 Review the listing under EPBC in the first year of the Plan.</p> <p>9.3.2 Ensure that listing is consistent across the range by year two of the Plan.</p> <p>9.3.3 All listings are reviewed in year five of the Plan.</p> <p>9.3.4 All habitat critical to the species is identified and, provided with appropriate protection under relevant jurisdictions.</p>

## Management Practices

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More detailed information relating to management practices influencing the recovery of the Orange-bellied Parrot is contained in the *Background Information for the Orange-bellied Parrot* (<http://www.deh.gov.au/biodiversity/threatened/recovery/list-common.html>).

Protection and restoration of non-breeding habitat (winter and migration) is the focus of this Plan. Key management practices that will influence this are:

- the placement and management of wind farms in all range States;
- estuary management, particularly in Victoria and South Australia;
- the decommissioning and land use of the Western Treatment Plant (Victoria);
- removal of stock and/or modification of grazing practices in coastal lands particularly in Tasmania;
- effective reduction of introduced predators and competitors;
- better understanding and management of toxic food plants and herbicides;
- effective control of recreational activities at key sites; and
- effective implementation of Commonwealth, State and local government legislation, particularly relating to land use planning at or adjacent to key OBP sites.

Notwithstanding the importance of focusing on non-breeding habitat, it is important to pay attention to a number of management practices within the breeding range. These include:

- successful implementation of prescribed burning to enhance foraging habitat in southwest Tasmania;
- effective reduction of introduced predators and competitors;
- effective control of visitor and development activities within the Tasmanian Wilderness World Heritage Area and Southwest Conservation Area; and
- careful management of founder stock to support the captive-breeding program.

## Recovery Plan Timetable, Estimated Costs and Organisational Arrangements

### Recovery plan timetable and estimated costs

The table below provides summary of recovery action components, priority, feasibility and funding requirements over the life of this Plan. Volunteer and in-kind contributions are not included in costing. Project Specific costs (PS) are not shown here due to variable funding requirements across different projects that are developed at the local and regional level.

<b>ACTION</b>	<b>Priority</b>	<b>Feasibility</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
<b>1.1 Observations of marked birds within the breeding range</b>	High	High						
BSPO salary			21.7	21.7	21.7	21.7	21.7	108.5
employ Site Coordinators at Melaleuca and Birchs Inlet (50%) Oct.–Mar.			19.5	19.5	19.5	19.5	19.5	97.5
allowances, supplies and field hut maintenance			6.7	6.7	6.7	6.7	6.7	33.5
aircraft charter			8.3	8.3	8.3	8.3	8.3	41.5
boat charter			4.9	4.9	4.9	4.9	4.9	24.5
Total			61.1	61.1	61.1	61.1	61.1	305.5
<b>1.2 Monitor breeding productivity</b>	High	High						
BSPO salary			11	11	11	11	11	55
tree climbing assistance			3	3	3	3	3	15
allowances, supplies and safety equipment			1.5	1.5	1.5	1.5	1.5	7.5
aircraft charter			1.6	1.6	1.6	1.6	1.6	8
boat operation			1	0.1	0.1	0.1	0.1	1.4
safety training			2	0.5	0.5	2	0.5	5.5
Total			20.1	17.7	17.7	19.2	17.7	92.4
<b>1.3 Coordinate surveys of population in the winter range</b>	High	High						
WSPO salary			20	20	20	20	20	100
allowances and equipment			2.5	2.5	2.5	2.5	2.5	12.5
vehicle hire and operating costs			2.4	2.4	2.4	2.4	2.4	12
Total			24.9	24.9	24.9	24.9	24.9	124.5

<b>ACTION</b>	<b>Priority</b>	<b>Feasibility</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
<b>1.4 Relationship between climatic variation, migration and breeding</b>	High	High	1	0	0	0	0	1
<b>2.1 Develop an integrated GIS site register of known and potential habitat</b>	High	High						
WSPO salary			5.6	5.6	5.6	5.6	5.6	28
supply vegetation and base layer information			20	0	0	0	0	20
GIS database construction			15	4	4	4	4	31
database management			0	7	4	4	4	19
Total			40.6	16.6	13.6	13.6	13.6	98
<b>2.2 Surveys of winter and migratory habitat</b>	High	Medium						
WSPO salary			20	20	20	20	20	100
allowances and equipment			2.5	2.5	2.5	2.5	2.5	12.5
vehicle hire and operating costs			2.4	2.4	2.4	2.4	2.4	12
Total			24.9	24.9	24.9	24.9	24.9	124.5
<b>2.3 Survey of entire breeding range</b>	High	Medium						
employ project Coordinator			2.5	0	0	0	2.5	5
allowances, supplies and safety equipment			5	1	1	1	5	13
helicopter charter			15	2.4	2.4	2.4	15	37.2
aircraft charter			6	0.8	0.8	0.8	6	14.4
Total			28.5	4.2	4.2	4.2	28.5	69.6
<b>2.4 Develop methods and innovative techniques to identify key sites and migration behaviour</b>	High	High						
technical development			5	0	0	0	0	5
prototype equipment			15	0	0	0	0	15
experimental field deployment costs			3	0	0	0	0	3
compact automated system production			0	50	0	0	0	50
program management			5	5	5	5	5	25
Total			28	55	5	5	5	98
<b>3.1 Review implement and effectiveness of management plans</b>	Medium	High	10	1.4	1.4	1.4	1.4	15.6
<b>3.2 Maintenance of foraging habitat at breeding sites through appropriate fire management</b>	High	Medium						
habitat management burns			13	13	13	8	8	55
vegetation monitoring			2	2	2	2	2	10
Total			15	15	15	10	10	65

<b>ACTION</b>	<b>Priority</b>	<b>Feasibility</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
<b>3.3 Provide, maintain and monitor nest boxes</b>	High	High						
BSPO salary			11	11	11	11	11	55
tree climbing assistance			4	3	3	3	4	17
allowances, supplies and safety equipment			2	1.5	1.5	1.5	2	8.5
supply, replacement and maintenance of nest boxes			2.1	0.7	0.7	0.7	2.1	6.3
helicopter charter			15	7.5	7.5	7.5	15	52.5
boat operation			0.2	0.2	0.2	0.2	0.2	1
Total			34.3	23.9	23.9	23.9	34.3	140.3
<b>3.4 Manage migratory habitat in Tasmania (including King Island)</b>	High	Medium						
cattle exclusion fencing and maintenance (APCA, Hunter Island and Perkins Island)			60	1.5	1.5	1.5	10	74.5
undertake a study on the grazing practices and impacts			30	0	0	0	0	30
monitor implementation of changed grazing regimes			0	6	6	6	6	24
Total			90	7.5	7.5	7.5	16	128.5
<b>3.5 Provide additional habitat at sites throughout the winter range</b>	High	Medium						
employ an extension officer to oversee habitat restoration projects			15.4	15.4	15.4	15.4	15.4	77
provide stipend to support experimental investigations into food resources			0	4	0	0	0	4
equipment, seed and land management costs for seed crop trials			0	20	0	0	0	20
undertake saltmarsh revegetation within core winter range			16.8	16.8	16.8	0	0	50.4
develop and fund a winter habitat restoration plan			0	0	25	PS	PS	25
Total			32.2	56.2	57.2	15.4	15.4	176.4
<b>3.6 Test suitability of unoccupied winter habitat by release of captive birds</b>	Medium	High						
radio telemetry study			4	4	0	0	0	8
<b>3.7 Conduct trial of impact of grazing by sheep on the upper saltmarsh (SNCR)</b>	High	Medium	26	14	14	0	0	54
<b>4.1 Monitor and control of human disturbance at SNCR and Swan Island</b>	High	High	0	0	0	0	0	0
assess trend of golfer numbers versus OBP numbers on Swan Island			2.8	0	0	0	0	2.8
develop bird tourism guidelines			2.8	0	0	0	0	2.8
Total			5.6	0	0	0	0	5.6
<b>4.2 Wind farm proposals</b>	High	Medium	0	0	0	0	0	
produce a detailed map of OBP sites in relation to wind farms			1.4	0	0	0	0	1.4
<b>4.3 Determine impact of squid fishery and other light sources during migration</b>	Medium	Medium	0	0	0	0	0	

<b>ACTION</b>	<b>Priority</b>	<b>Feasibility</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
<b>4.4 Control of introduced predators at migratory and wintering sites</b>	Medium	Low	PS	PS	PS	PS	PS	PS
<b>4.5 Impact of introduced bird competitors</b>	Low	Low	0	5	0	0	0	5
<b>4.6 Control of invasive weeds in native vegetation areas</b>	High	Medium						
develop site based control programs			14	14	8	0	0	36
implement control programs			0	PS	PS	PS	PS	PS
monitor effectiveness of control programs			0	0	6	6	6	18
Total			14	14	14	6	6	54
<b>4.7 Population Viability Analysis (PVA)</b>	High	High	2	2	2	2	2	10
<b>4.8 Management of aircraft and other human activities at Melaleuca</b>	High	High	0	0	0	0	0	0
<b>5.1 Maintain breeding population at Birchs Inlet</b>	High	Medium						
BSPO salary			21.9	21.9	21.9	21.9	21.9	109.5
employ a Site Coordinator (50%) Oct - Mar			6.5	6.5	6.5	6.5	6.5	32.5
allowances, supplies and field hut maintenance			5.3	5.3	5.3	5.3	5.3	26.5
boat charter			12.6	12.6	12.6	12.6	12.6	63
aircraft charter			2.5	2.5	2.5	2.5	2.5	12.5
Total			48.8	48.8	48.8	48.8	48.8	244
<b>5.2 Identify other potential release sites within breeding range.</b>	Medium	Medium	10	0	0	0	0	10
<b>6.1 Management of captive breeding program.</b>	High	High						
employ a Captive management coordinator			27.5	27.5	27.5	27.5	27.5	137.5
employ Keepers								
- Taroona			14.6	14.6	14.6	14.6	14.6	73
- Healesville			27.5	27.5	27.5	27.5	27.5	137.5
- Adelaide Zoo			4.4	4.4	4.4	4.4	4.4	22
- Melbourne Zoo			4.4	4.4	4.4	4.4	4.4	22
veterinary support			7.7	7.7	7.7	7.7	7.7	38.5
pathology costs			3	3	3	3	3	15
DNA sexing			2	2	2	2	2	10
air transport			1.5	1.5	1.5	1.5	1.5	7.5
seed and fresh food supplies			2.7	2.7	2.7	2.7	2.7	13.5
operating costs and aviary maintenance			21.4	21.4	21.4	21.4	21.4	107
Total			89.2	89.2	89.2	89.2	89.2	446

<b>ACTION</b>	<b>Priority</b>	<b>Feasibility</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
<b>6.2 Manage genetic diversity.</b>	High	High	4.5	4.5	4.5	4.5	4.5	22.5
<b>7.1 Develop and maintain communication pathways to meet the needs of stakeholders and the broader community</b>	High	High						
stakeholder market research			3	0	0	0	0	3
website establishment and management			4	2	2	2	2	12
field day facilitation			2	2	2	2	2	10
Total			9	4	4	4	4	25
<b>7.2 Support existing and establish new OBP regional groups.</b>	High	High						
field day and volunteer training			4	16	16	16	16	68
WSPO salary			5.6	5.6	5.6	5.6	5.6	28
BSPO salary			2.5	2.5	2.5	2.5	2.5	12.5
Natural Resource Management regional facilitation and support			30	30	30	30	30	150
Total			42.1	54.1	54.1	54.1	54.1	258.5
<b>7.3 Produce recovery program newsletter.</b>	High	High						
graphic design and website production			1.2	1.2	1.2	1.2	1.2	6
printing and distribution			2.5	2.5	2.5	2.5	2.5	12.5
Total			3.7	3.7	3.7	3.7	3.7	18.5
<b>7.4 Coordinate volunteer involvement in recovery program.</b>	High	High						
develop and distribute volunteer programs			1.4	1.4	1.4	1.4	1.4	7
foster relationships with volunteer organisations and networks			1.4	1.4	1.4	1.4	1.4	7
monitor and report on volunteer activities and effort			5.6	5.6	5.6	5.6	5.6	28
<b>8.1 Develop and implement a Recovery Fund Plan.</b>	High	High						
advertise for expressions of interest to sponsor program			5	0	0	0	0	5
develop and manage sponsorship and donor program			30	10	10	10	10	70
Total			35	10	10	10	10	75
<b>8.2 Develop a program to foster collaborative research activities at tertiary institutions.</b>	High	High	0	0	0	0	0	0
<b>9.1 Maintain an effective Recovery Team that organises, implements, reviews and reports on recovery effort.</b>	High	High						
WSPO salary			2.4	2.4	2.4	2.4	2.4	12
BSPO salary			2.2	2.2	2.2	2.2	2.2	11
accommodation and allowances			3.6	3.6	3.6	3.6	3.6	18
transport			2.3	7.1	5	2.3	7.1	23.8

<b>ACTION</b>	<b>Priority</b>	<b>Feasibility</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>Total</b>
meeting costs			1.5	1.5	1.5	1.5	1.5	7.5
Total			12	16.8	14.7	12	16.8	72.3
<b>9.2 Maintain Recovery Program Coordination</b>	High	Medium						
RPC salary			0	20	20	20	20	80
BSPO salary			5.4	5.4	5.4	5.4	5.4	27
WSPO salary			5.9	5.9	5.9	5.9	5.9	29.5
Total			11.3	31.3	31.3	31.3	31.3	136.5
<b>9.3 Review listings throughout the range</b>	High	High	0	0	0	0	0	0
<b>Total funding requirements</b>			<b>884.6</b>	<b>883</b>	<b>756.8</b>	<b>730.4</b>	<b>796.4</b>	<b>4086.2</b>

## Organisational arrangements

The OBPR is responsible for overseeing and reviewing progress of the recovery program in conjunction with project staff identified against each recovery action. In most instances implementation of actions contained within this Plan rests with State conservation agencies. Funding and implementation for actions will also involve Natural Resource Management regional groups. The table below identifies the groups responsible for implementation of actions and the priority of each action.

<b>NRM Region/Group Name</b>	<b>High Priority</b>	<b>Medium Priority</b>	<b>Low Priority</b>
<b>New South Wales</b>			
Sydney Metro CMA	2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1	4.5
Southern Rivers CMA	2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1	4.5
<b>South Australia</b>			
SA Murray Darling Basin INRM	1.3, 2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1	4.5
South East INRM	1.3, 2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1	4.5
<b>Tasmania</b>			
Cradle Coast NRM	1.1, 1.2, 1.3, 2.1, 2.3, 2.4, 3.2, 3.3, 3.4, 4.3, 5.1, 7.1, 7.2, 9.3	3.1	4.5
Southern NRM	1.1, 1.2, 2.1, 2.4, 3.2, 3.3, 4.1, 4.3, 7.1, 7.2, 9.3	3.1	4.5
<b>Victoria</b>			
Corangamite CMA	1.3, 2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1, 3.6	4.5
East Gippsland CMA	1.3, 2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1, 3.6	4.5
Glenelg Hopkins CMA	1.3, 2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1, 3.6	4.5
Port Phillip and Western Port CMA	1.3, 2.3, 3.5, 3.7, 4.2, 4.3, 7.1, 7.2, 9.3	3.1, 3.6	4.5, 4.7
West Gippsland CMA	1.3, 2.1, 2.3, 3.5, 4.3, 7.1, 7.2, 9.3	3.1, 3.6	4.5

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## Appendix 1      Abbreviations used in the Recovery Plan

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AEMA	Adaptive experimental management approach
AGDEH	Australian Government Department of the Environment and Heritage
AZ	Adelaide Zoo
BSPO	Breeding Season Project Officer
CMA	Catchment Management Authority
CMC	Captive Management Coordinator
CMG	Captive Management Group
DEH	South Australian Department for Environment and Heritage
DPIWE	Tasmanian Department of Primary Industries, Water and Environment
DSE	Victorian Department of Sustainability and Environment
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
HS	Healesville Sanctuary
INRM	Interim Natural Resource Management Region
NRM	Natural Resource Management
NSW	New South Wales
NSW NPWS	New South Wales National Parks and Wildlife Service
OBP	Orange-bellied Parrot
OBPRT	Orange-bellied Parrot Recovery Team
PWS	Tasmanian Parks and Wildlife Service
RFP	Recovery Fund Plan
RPC	Recovery Plan Coordinator
SA	South Australia
SNCR	Spit Nature Conservation Reserve
TUC	Trumped-up Corella
WSPO	Winter Season Project Officer
WTP	Melbourne Water's Western Treatment Plant

