# Introducing the NSW Threatened Species Priorities Action Statement (PAS)



Department of Environment & Climate Change NSW



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The PAS is displayed in detail on the DECC threatened species website: www.threatenedspecies.environment.nsw.gov.au

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### Foreword

The conservation of our native plants and animals is one of the greatest environmental challenges facing NSW today.

More than 70 species that used to exist in NSW are now presumed extinct and over 950 are listed as threatened.

The NSW Government is implementing reforms to improve ways in which we deal with threats that diminish our native plant and animal populations.

These reforms include the introduction of the NSW Threatened Species Priorities Action Statement (PAS), a strategic approach for the long-term survival of our most threatened native plants and animals.

The PAS provides strategies to recover threatened species and abate the key threatening processes they face; lists actions to be implemented; and identifies performance measures to ensure all efforts are effective.

This is the Department of Environment and Climate Change's (DECC's) first PAS, and we intend to add new strategies and actions to it as new priorities emerge.

To be successful, the PAS needs support from all levels of government and the community whose expertise and involvement will be crucial in implementing actions requiring specialised knowledge of NSW regions, landscapes, and threatened plants and animals. DECC has initiated this process by identifying a suite of actions it will implement over the next three years.

I urge all land managers, researchers, community groups and private landholders who are involved with threatened species conservation to use the PAS as a primary resource for the implementation of recovery and threat abatement actions, and to contribute to it over time so that it can be a repository and guide for our efforts.

lisa Corbyn

LISA CORBYN Director General

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### **Executive summary**

Loss of biodiversity and the overall decline of native species are two of NSW's greatest environmental challenges.

This loss and decline are largely the result of social pressures and demands over the last 150 years, and are due to the impacts of agriculture, urban development and unsustainable natural resource management practices.

The resulting loss, fragmentation and degradation of habitat have been compounded by the introduction of threats such as pests and weeds, diseases, inappropriate fire and grazing regimes, and pollution.

To help resolve these problems, the NSW Government amended the *Threatened Species Conservation Act 1995* (TSC Act). It now requires a new approach for planning and implementing actions to recover threatened native plants and animals and manage the threats they face.

Previously, the TSC Act required the preparation of a recovery plan for each threatened species, population or ecological community and a threat abatement plan for each listed key threatening process (KTP). However, as the number of threatened species listed under the Act grew, this approach became increasingly unworkable.

The Government recognised the need for a new approach. Actions for all threatened species needed to be readily identified and coordinated, so the impacts on them could be reduced by integrating planning for recovery of threatened species with urban and rural land use planning and decision-making, and landscape restoration investments. As a result, the NSW Threatened Species Priorities Action Statement (PAS) was conceived to provide a strategic approach to threatened species recovery which could be used by all members of the community. The draft PAS was publicly exhibited in May 2006.

Since the draft was published, DECC has updated the PAS. There are now more species covered by the PAS as well as actions for their recovery. DECC has also included new recovery strategies for some species and refined existing PAS actions for others. A process for prioritising species and identifying actions to be implemented over the next three years has also been developed.

The full PAS, which includes all detailed recovery and threat abatement actions, can be found on the DECC threatened species website: www.threatenedspecies.environment. nsw.gov.au.

For the PAS to be effective, it needs the expertise and commitment of stakeholders and community members. Many PAS actions will enhance local government or catchment management planning, and others will need the specialist knowledge provided by land managers, the development industry, conservation groups, Aboriginal communities, scientists and academics, and the broader community. Other actions will require knowledge of local landscapes or species, or resources only local communities can provide.

Land managers and other stakeholders should use the PAS when developing their threatened species recovery programs. DECC is therefore keen to gain the support of those who can help to implement the PAS and has initiated work with relevant stakeholders such as catchment management authorities, councils and land managers to select and invest in recovery implementation. Seeking support from current and new partners will be an ongoing process.

This publication is a guide to the PAS. DECC intends to update and refine information about the PAS on the DECC website on an ongoing basis, with a full review to be undertaken in 2010.

# 1 Introduction

Please note that the term 'threatened species' throughout this document refers to threatened species, populations and ecological communities.

# **1.1 Threatened species reform and the Priorities Action Statement**

In NSW over 840 species, 35 populations and 75 ecological communities are threatened. They are classified under the NSW *Threatened Species Conservation Act 1995* (TSC Act) as either 'critically endangered,' 'endangered' or 'vulnerable.' Many of these species are also considered threatened nationally and are listed under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Over 70 other species are presumed to be extinct.

In addition to lists of threatened species, 30 key threatening processes (KTPs) are identified in the TSC Act. A KTP adversely affects threatened species, or could cause those that are not threatened to become threatened. If left unchecked, KTPs will inevitably cause the extinction of species, populations and communities.

The continuing increase in the number of threatened species is due in part to the ongoing effects of land management practices. However, there has also been an increased understanding of the conservation status of many species such as invertebrates, fungi, plants and ecological communities, leading to new species being classified as threatened under the TSC Act.

At the same time, new biodiversity information also shows that some species may be more abundant than was originally determined.

Many threatened species are affected by a combination of threats including clearing and modifying of vegetation, altered fire and hydrological regimes, grazing pressure, competition or predation from introduced pests, disease, climate change and rising salinity. The largest consistent threat is habitat loss, fragmentation or degradation from urban and agricultural intensification.

In 2004, the NSW government reformed the TSC Act to better integrate threatened species with rural and urban land use planning and natural resource management, and with improvements to the development assessment process. To complement these reforms, a draft NSW Threatened Species Priorities Action Statement (PAS) was introduced in May 2006.

The TSC Act requires the Director General of the Department of Environment and Climate Change (DECC) to prepare and adopt a PAS that:

- sets out the recovery and threat abatement strategies to be adopted for each threatened species
- establishes relative priorities and actions to implement the above strategies
- establishes performance indicators to report achievements in implementing recovery and threat abatement strategies and their effectiveness
- contains a status report on each threatened species (where information is available)
- sets out clear timetables for recovery and threat abatement planning and achievement.

DECC has now prepared the PAS which can be found on **www.threatenedspecies**. **environment.nsw.gov.au**. This website is designed so stakeholders and community members can easily:

- retrieve recovery and threat abatement actions for each threatened species and KTP
- identify similar recovery and KTP abatement strategies and actions that occur in each broad geographical area.

From the website, links can be made to other information such as threatened species profiles, NSW Scientific Committee determinations, and recovery and threat abatement plans.

Stakeholders or community members can use the website to help them select recovery and threat abatement actions to implement. The relevant DECC office can assist (see Appendix 1).

This publication summarises the PAS. It also provides information on threatened species and advises stakeholders and the community of ways in which they can implement recovery and threat abatement actions. Detailed information on all these actions is provided on the website.

### 1.2 Objectives and principles of the PAS

### Objectives

The objectives of the PAS are to:

- move as many species as possible from threatened to non-threatened conservation status
- abate or eliminate the impacts of KTPs
- provide a comprehensive and strategic approach to threatened species recovery, by making a list of strategies and prioritised actions in the PAS readily available on the website
- involve stakeholders, including managers and decision makers at all levels, in working together to implement PAS actions.

To this end, DECC has developed the PAS in accordance with the following principles.

### **Principles**

#### Achieve recovery of threatened species and abate KTPs

- To identify and communicate what actions need to be implemented and where they should be undertaken.
- To conserve threatened species in the habitats in which they occur.
- To improve management of threatened species by increasing knowledge of their biology and ecology and the processes that threaten them.
- To include the best available information in the PAS by incorporating information from existing recovery and threat abatement plans, and knowledge held by stakeholders and the community.

### Work collaboratively with stakeholders to implement actions that meet the needs of threatened species in specific habitats

- To ensure this information is communicated to people or organisations involved in conserving threatened species.
- To consult with Aboriginal people who may have cultural obligations towards, or are the holders of knowledge about, a particular species.
- To ensure appropriate management strategies are implemented by consulting with and encouraging the involvement of stakeholders.
- To share the opportunities of recovering threatened species with all who can contribute.
- To use limited resources effectively and strategically to achieve maximum conservation outcomes.

#### Meet legislative requirements

• To meet state, national and international agreements to conserve threatened species.

### 1.3 About the PAS

The PAS is based on 34 unique recovery and threat abatement strategies. Under each strategy, several actions may be listed. These are further categorised into high, medium and low priority actions and where feasible are assigned to the broad geographic area where they are best placed to occur, that is, catchment management area or local government area.

For more information on strategies and actions, see chapter 2.

### 1.4 What the public can do

For the PAS to work, actions need to be implemented by different parties with the knowledge and resources to carry them out effectively. The PAS needs:

- the expertise of all parties to ensure actions are appropriate and achievable input from experts in threatened species recovery is needed to ensure actions in the PAS are appropriately targeted and implemented, especially in local areas. Experts include Aboriginal people, land managers, planners and researchers, developers, government agencies, academic institutions, farmers and landowners, conservation groups, and other members of the community with valuable expertise and specialised knowledge.
- the involvement of all interested and affected parties, so as many actions as possible can be implemented – threatened species and the processes threatening their survival occur in all regions on private and public lands. Many threatened species are very poorly represented in conservation reserves.

DECC has identified agencies and funding bodies that may be able to assist with implementing PAS actions and will initiate a process of consultation with these agencies.

The broader community can also become involved in implementing the PAS. DECC has prepared a guide for facilitating community involvement in threatened species recovery (DEC 2006a), which is available at www.environment.nsw.gov.au/threatspec/tscominvmanint.htm.

### 1.5 Benefits of the PAS

PAS actions can be easily integrated into local planning and conservation initiatives. The table below identifies ways in which the PAS can help stakeholders undertake threatened species recovery.

#### Table 1: Benefits of the PAS to the community

#### Benefits for catchment management authorities (CMAs)

The PAS can help CMAs:

- meet threatened species targets in their catchment action plans
- decide which investment strategies and threatened species actions to implement
- report on the progress of actions they have agreed to implement or invest in.

#### Benefits for planning authorities

The PAS can help planning authorities:

• determine conservation management actions that can be included in consent or approval conditions to offset impacts on threatened species.

#### Benefits for land managers

The PAS can help land managers:

- target funding to high priority actions in their geographical area such as regenerating native vegetation, protecting and managing habitat, undertaking surveys and controlling predators
- identify priority actions that they can adopt as part of a conservation agreement.

#### **Benefits for Aboriginal communities**

The PAS can:

- guide partnerships between Aboriginal communities and the government to ensure natural and cultural values are integrated with management strategies for threatened species
- ensure proposed recovery and KTP actions do not adversely impact on Aboriginal people's ability to undertake cultural practices.

#### Benefits for researchers, scientists, students, conservation and community groups

The PAS can help people involved in conservation projects:

- select priority research projects for threatened species and KTPs
- choose PAS actions to implement that are relevant to their local area
- educate the community and raise awareness
- develop applications for grants and other funds, using PAS actions which will reflect the best available information.

### **1.6 What has happened since the draft PAS was exhibited**

The draft PAS was placed on public exhibition from May to August 2006. Since that time, DECC has used recommendations made in public submissions to improve the PAS. Improvements include the:

- inclusion of many additional species, accompanied by actions for their recovery. The PAS now covers over 93% of listed threatened species and KTPs. DECC plans to have actions for all species identified by the end of 2007. Species that do not currently have actions associated with them can be easily identified on the website.
- **creation of new recovery strategies** to enable detailed actions to be more easily grouped and selected.
- refinement of actions relevant to the management of fire so they can be better integrated with existing fire management planning practices.
- refinement of actions relevant to the *ex-situ* collection and propagation of threatened plants. Detailed actions have been reviewed and standardised to assist DECC to better plan and prioritise its seed collection and *ex-situ* collection and propogationprogram.
- provision of more detailed information on the location of many species that require specific on-ground recovery actions.
- identification of other land managers and stakeholders who may assist with the implementation of actions. DECC will approach these agencies over the next 12 months to seek their involvement with the PAS. This process has already been initiated with some catchment management authorities and local councils.
- development of a process to assist DECC to prioritise species and select actions it will implement on land it manages.
- enhancement of the website to allow for more flexible and efficient retrieval of information.

# **2 Strategies and actions**

### 2.1 About PAS strategies and actions

The PAS is based on 34 recovery and threat abatement strategies, which are listed in section 2.2. They represent DECC's understanding of the broad tools required to recover each threatened species and abate each KTP.

Strategies have been identified for most threatened species and KTPs. The strategies assigned to a species depend on the threats facing that species and the information required to ensure effective management of the species or its habitat. For most species, achieving recovery and threat abatement will depend on implementing more than one strategy.

The PAS also contains detailed actions which are grouped under these strategies. Actions provide further information on what is required to secure recovery and have been developed using the expertise of DECC staff and external experts. Recovery and threat abatement strategies and their actions range from simple actions such as 'doing a survey to clarify the distribution of a species' or 'controlling weeds that have invaded a key site for a species', to 'preparing guidelines to ensure threatened species requirements are adequately assessed before giving consent or approval to a proposed development', or 'complex research into why a species has declined'.

Each strategy and action has been prioritised according to its relative importance for achieving recovery or threat abatement for each species and KTP. Priorities are described in more detail in section 2.5.

At this stage, strategies and detailed actions are yet to be identified for every threatened species and KTP. DECC intends to complete this task by December 2007 and will update the PAS periodically.

Where practical, the PAS has identified the location of an action as being in one or more broad geographic areas. Geographic areas can be catchment management areas or local government areas. These areas identify the broad location where the action is best placed to occur, and the location information can assist land managers who are seeking to implement actions in a particular geographic area. With many species, more specific location information information is provided with the detailed action.

Some strategies and actions, such as recovery plan preparation or the review and amendment of existing policies and procedures, may not apply to a particular location but are generic to the species or KTP. A broad geographic location will not be assigned for such actions.

A longer-term goal is to identify key locations for each threatened species. Actions can then be tailored to each location to abate the specific threat operating at a particular site.

### 2.2 PAS strategies

In the list of PAS recovery and threat abatement strategies on the next page, strategies are grouped with other strategies they logically relate to, for example, all habitat management strategies are grouped together. Strategies that apply to both recovery and threat abatement planning are indicated with an asterisk '\*'. A detailed description of each strategy is provided in Appendix 2.

The PAS strategies are:

- Assessing threats and determining recovery strategies
- Surveying/mapping and habitat assessment\*
- Monitoring\*
- Data recording and storage
- Habitat protection
- Habitat management: feral animal control
- Habitat management: weed control
- Habitat management: fire
- Habitat management: advice to consent and planning authorities
- Habitat management: site protection
- Habitat management: grazing
- Habitat management: water
- Habitat management: other
- Habitat rehabilitation: restoration and regeneration
- Disease and pathogens\*
- Utilisation (direct take) (see Appendix 2 for explanation of 'direct take')\*
- Community and landholder liaison, awareness and education\*

- Aboriginal liaison and interpretation
- Research\*
- Captive husbandry or *ex-situ* collection and propagation
- Translocation and reintroduction
- Conservation status review
- Recovery plan preparation
- Threat abatement plan preparation\*
- Coordinating the recovery action or threat abatement program\*
- Reviewing and amending or adopting existing legislation and policies
- Developing and implementing protocols and guidelines\*
- Establishing management agreements with public authorities, catchment management authorities and land managers/landowners
- Reviewing evidence of impacts
- Prioritising control actions
- Undertaking control actions
- Measuring the response to control actions
- Preparing a statement of intent
- Other action\*

### 2.3 Integrated recovery and threat abatement

Recovering threatened species and ameliorating KTPs will require an integrated approach that uses different strategies and a mix of recovery and threat abatement actions. This is because many threatened species are affected by more than one threat, each of which may require more than one strategy or action to ameliorate. An approach that involves integrating multiple recovery and threat abatement actions will often be more successful than implementing each action separately, and is a more effective use of resources.

For example, a remnant of an endangered ecological community situated near residential areas may be threatened by sedimentation, weeds, trampling, pollution, and rubbish dumping. Carrying out weed control alone would not prevent this remnant from being further degraded or allow it to regenerate. An integrated approach would need to be adopted that, as well as weed control, included stormwater and erosion controls, restrictions on access, and education of surrounding residents.

Efforts will need to be focused on remnant areas with the best hope of survival. DECC has initiated a process of determining high conservation value areas and habitats which will benefit most from implementation of PAS actions (see next section).

### 2.4 Defining relative priorities

Strategies and their associated actions have been prioritised in terms of the contribution they make to achieving the recovery of a threatened species or abating a KTP. Three levels of priority have been identified.

#### High priority actions:

- will make a significant difference to recovery or threat abatement
- often require urgent implementation, and failure to implement them is likely to eventually lead to a negative change in the conservation status of a threatened species
- provide essential information on the distribution or conservation status of a threatened species, or on the threats affecting a species this information is often an essential precursor to the design and implementation of other management actions.

**Medium priority actions** will make an important contribution to recovery or threat abatement, although their implementation is less urgent than implementing high priority actions.

Low priority actions add considerable additional value to recovery and threat abatement and their implementation, although not essential, is desirable.

Depending on the location, nature and severity of the threats affecting a threatened species, any strategy or action can be assigned a high, medium or low priority. For example, community education may be a high priority for a threatened species that occurs predominantly on freehold land which is subject to development or other land management pressures. Education can raise awareness of the potential threats arising from habitat disturbance, clearing or grazing; create opportunities for future management; and complement other high priority actions that maintain or restore habitat. In contrast, community education for a threatened species that lives in a secluded area of a conservation reserve will probably be considered of lower priority.

The assignment of action priorities in the PAS has been prepared by DECC staff in consultation with experts from outside the organisation.

### 2.5 Selecting actions for implementation

Land managers and other stakeholders should use the PAS when developing strategic threatened species recovery and threat abatement programs. DECC has used the PAS to select actions it will implement over the next three years.

The PAS contains many actions for many land tenures. Effective implementation of the PAS will require all land managers and stakeholders who have a responsibility or interest in threatened species conservation to get involved.

DECC has started to link PAS actions to public authorities and other stakeholders who may be best placed to implement them. DECC intends to provide each potential conservation partner with a list of relevant PAS actions and work with them to select priority species and actions. DECC has already initiated this process with a number of CMAs and is helping them to develop threatened species programs that reflect priorities for their geographic areas.

Many threatened species occur on private lands or have recovery requirements beyond the jurisdiction of DECC. Individual property owners, community groups and institutions such as universities are encouraged to identify actions that they can implement. DECC can help to identify priority species and habitats in a particular area, and recommend the necessary recovery and threat abatement strategies and actions to ensure their survival.

DECC has developed a model for priority actions it will implement, particularly on the 6.5 million hectares of national parks and reserves that it manages. The model combines the

distribution and abundance of a species in a DECC park area with the PAS action priorities for that species, to create a ranking (see Table 2 below).

AREA IMPORTANCE	ACTION PRIORITY		
	High	Medium	Low
High	High/High	High/Medium	High/Low
	(Priority 1)*	(Priority 2)	(Priority 2)
Medium	Medium/High	Medium/Medium	Medium/Low
	(Priority 2)	(Priority 2)	(Priority 3)
Low	Low/High	Low/Medium	Medium/Low
	(Priority 2)	(Priority 3)	(Priority 3)

Table 2: DECC park area and actions priority matrix

\* A Priority 1 ranking is the highest implementation priority

Priority 1 rankings were given to:

- endangered populations, endangered ecological communities and species threatened by KTPs
- species considered rare or that were distributed over fewer than three areas.

The final actions for implementation were selected in a workshop that involved DECC staff in assessing:

- multi-species benefits: actions for threatened species that occur in the same habitat or geographic area can be combined and undertaken at the same time, regardless of their priority.
- the potential risk of local extinctions and the ability to recover: knowledge of the local or regional conservation status of a species will influence whether resources should be directed to actions for that species.
- the implementation of previously agreed actions: some actions have been formally agreed to in recovery and threat abatement plans or may already be part of a successful long-running implementation program.
- community support: some species are iconic, have a high degree of community interest and support, and may involve cross tenure partnerships with other land managers and stakeholders.

In addition to managing threatened species in national parks and reserves, DECC is responsible for research into, and the regulation and sustainable management of, threatened species on other land tenures. DECC also aims to undertake priority actions in these areas.

All the actions that DECC has selected for implementation will be published on www.threatenedspecies.environment.nsw.gov.au. DECC will annually report on which actions have commenced, are ongoing, are completed or have not commenced.

# **3 Measuring performance**

Under the PAS, DECC is required to:

- establish performance measures to help it report on achievements in implementing recovery and threat abatement strategies
- during the review period every three years, report on:
  - achievements in implementing PAS strategies
  - the status of each threatened species, population and ecological community.

#### **Performance measures**

DECC will measure the achievements and effectiveness of the PAS by:

- monitoring the progress of strategies and actions towards implementation
- assessing the response of each threatened species, population and ecological community to recovery and threat abatement strategies and actions.

DECC will maintain a register of strategies and actions that it has committed to implementing and will monitor and report on their ongoing progress. Where practical, DECC intends to complete a minimum of 80% of the actions it has selected for implementation.

It may not be possible to monitor all actions to completion, as some actions will continue until the threat affecting the species has been eliminated. This may take longer than the threeyear review period of the PAS. For example, the control of foxes or weeds at a high priority site may need to be undertaken for many years to ensure the threat of predation or loss of habitat is minimised. In other cases, some actions may not be initiated until other actions are completed. For example, an assessment of the conservation status of a species may only be undertaken once all other priority recovery actions have been implemented.

DECC will invite other agencies to monitor the ongoing progress of strategies and actions they choose to implement and can assist with publishing this information on the website. This whole-of-government approach to monitoring the uptake and implementation of PAS actions will help agencies such as CMAs demonstrate ways in which they have met threatened species targets in their catchment action plans. Such an approach will support the recent DECC development of a NSW monitoring and evaluation program to meet natural resource management requirements for threatened species.

A more direct assessment of recovery can be measured by the response of individual species, populations, ecological communities and their habitats to action implementation. This response may be measured in terms of a positive, stable or negative change in:

- the distribution or abundance of a species or population, or the extent of an ecological community
- habitat condition
- the severity of the risk or threat.

DECC will, where the information is available, assess the status of each species, population and ecological community against the above three parameters. This will constitute the threatened species status report. DECC will include in this report the reliability of the assessment as high, medium or low.

Inherent in an assessment of response is uncertainty resulting from:

- a lack of knowledge due to the secretive nature and natural low abundance of many threatened species and insufficient information on their biology and ecology
- the influence of compounding physical factors such as wildfire or drought.

# 4 Timetable for recovery and threat abatement planning

The NSW *Threatened Species Conservation Act 1995* requires the PAS to identify clear timetables for recovery and threat abatement planning and achievement.

The PAS identifies threatened species, populations and ecological communities for which a single species, multi-species, multi-community or regional recovery plan is the most suitable response. Recovery plans are most suitable for species that:

- are iconic, or
- have complex conservation issues involving a suite of management actions, or
- require the input and agreement of multiple stakeholders including Aboriginal communities.

DECC intends to review, initiate or complete 31 recovery plans within the first three years of the PAS (see table 3 on the next page). These comprise 27 single species or ecological community recovery plans and four multi-species, multi-community and regional recovery plans. Some plans are currently funded by the Natural Heritage Trust or are drafts which have been publicly exhibited. The priority of these plans has been identified in accordance with DECC policy (NPWS 2001c).

The PAS also identifies KTPs for which a threat abatement plan (TAP) will be prepared. The development of a TAP is most appropriate where the:

- KTP significantly affects biodiversity or is the main threat to many species
- severity of impact from the KTP varies across different locations and requires a planned coordinated approach to threat abatement
- existing threat abatement strategies in other conservation planning documents and policy instruments need to be combined into one document
- management of the threat requires coordination and commitment from several public authorities and stakeholders.

Five TAPs will be prepared in the next three years (see table 3).

DECC is developing a statement of intent that describes DECC's policy regarding each KTP. Statements of intent are described in more detail in Appendix 2. Priority setting for the development of TAPs and statements of intent has taken into account:

- any existing state and national government commitments to abate the KTP
- the iconic status of the KTP, that is, community expectation that the government will manage the threat
- the severity of impact on biodiversity, that is, whether the KTP is the main threat to many species, populations or ecological communities and the potential risk the KTP poses to biodiversity if unabated
- the capacity to effectively manage a KTP through a statement of intent/TAP-led initiative.

# **5** Reviewing the PAS

The PAS will be reviewed every three years to assess priority rankings for species, with the first review due in 2010. When reviewing the PAS, the Director General of DECC will consult with committees and councils established under the TSC Act including the NSW Scientific Committee, Natural Resources Commission, Biological Diversity Advisory Council, Social and Economic Advisory Council, and other relevant state government agencies and interested parties.

Table 3: List of re	covery plans	and threat	abatement	plans to b	e reviewed,
initiated or compl	leted by 2010				

Plan name Single-species recovery plan	Proposed date of completion	Plan status
Angus's onion orchid ( <i>Mictotus angusii</i> ) recovery plan	2007	
Asterolasia elegans recovery plan	2007	
Austral toadflax (Thesium australe)	2007	
Barking owl (Ninox connivens) recovery plan	2007	Exhibited draft
Blotched sarcochilus (Sarcochilus weinthalii)	2007	
Brush-tailed rock wallaby (Petrogale penicillata) recovery plan	2007	Exhibited draft
Bynoes wattle (Acacia bynoeana) recovery plan	2007	
Camden white gum (Eucalyptus benthamii) recovery plan	2008	
Deanes melaleuca (Melaleuca deani) recovery plan	2007	
Dorrigo daisy bush (Olearia flocktoniae)	2007	Exhibited draft
Duffys Forest EEC recovery plan	2007	
Dwarf mountain pine (Microstrobus fitzgeraldii) recovery plan	2007	
Eastern bristlebird (Dasyornis brachypterus) recovery plan	2009	
Giant burrowing frog (Helioporus australiacus) recovery plan	2007	
Green and golden bell frog (Litoria aurea) recovery plan	2007	
Grey-headed flying fox (Pteropus poliocephalus) recovery plan	2008	
Hibbertia superans recovery plan	2007	
Koala (Phascolarctos cinereus) recovery plan	2007	Exhibited draft
Long-nosed bandicoot (Endangered Population) (Perameles nasutu)	2007	
Magenta lily pily (Syzygium paniculatum)	2007	
Native jute (Corchorus cunninghamii)	2007	Exhibited draft
Persoonia bargoensis recovery plan	2007	
Persoonia hirsuta recovery plan	2007	
Pulteneae sp. Genowlan Point (EP) recovery plan	2007	
Scented acronychia (Acronychia littoralis)	2007	
Sunshine wattle (Acacia terminalis ssp terminalis) recovery plan	2007	
Tadgells bluebell (Wahlenbergia multicaulis) recovery plan	2007	
Multi-species or endangered ecological community recovery plan		
Lord Howe Island Biodiversity management plan	2007	Exhibited draft
Hunter Coastal Rivers CMA prioritisation plan	2008	
Border Ranges hotspot multi-species recovery plan	2007	
Cumberland Plain EECs recovery plan (11 EECs)	2007	
Threat abatement plan		
Predation by the European red fox (plan review)	2008	
Competition and habitat degradation by feral goats	2009	
Infection of native plants by Phytophera cinnamomi	2009	
Bushrock removal	2010	
Removal of dead wood and dead trees	2010	

Key: EEC = endangered ecological community; EP = endangered population

# Appendices

### **Appendix 1: DECC contacts for PAS actions**

# For general information about the PAS and species, populations and ecological communities that occur across NSW

Head, Biodiversity Conservation Unit Vegetation and Biodiversity Management Branch Conservation, Landscapes and Policy Group Department of Environment and Climate Change PO Box A290 SYDNEY SOUTH NSW 1232 Phone: (02) 9995 5449

# For PAS actions relevant to species, populations and ecological communities that occur in the Sydney Metropolitan Region (includes Hunter and Illawarra regions)

Manager, Biodiversity Conservation Section Metropolitan Branch Department of Environment and Climate Change PO Box 1967 HURSTVILLE NSW 2220 Phone: (02) 9585 6952

### For PAS actions relevant to species, populations and ecological communities that occur in the north-west of NSW

Head, Biodiversity Conservation Unit North West Branch Department of Environment and Climate Change PO Box 2111 DUBBO NSW 2830 Phone: (02) 6883 5354

### For PAS actions relevant to species, populations and ecological communities that occur in the north-east of NSW

Manager, Biodiversity Conservation Section North East Branch Department of Environment and Climate Change Locked Bag 914 COFFS HARBOUR NSW 2450 Phone: (02) 6659 8232

### For PAS actions relevant to species, populations and ecological communities that occur in southern NSW

Manager, Biodiversity Conservation Section South Branch Department of Environment and Climate Change PO Box 2115 QUEANBEYAN NSW 2620 Phone: (02) 6298 9715

#### For PAS actions relevant to key threatening processes relating to pest species

Manager, Pest Management Unit Reserve and Wildlife Conservation Branch Parks and Wildlife Group Department of Environment and Climate Change PO Box 1967 HURSTVILLE NSW 2220 Phone: (02) 9585 6651

#### For PAS actions relevant to other key threatening processes

Head, Biodiversity Conservation Unit Vegetation and Biodiversity Management Branch Conservation, Landscapes and Policy Group Department of Environment and Climate Change PO Box A290 SYDNEY SOUTH NSW 1232 Phone: (02) 9995 5449

# Appendix 2: Description of each recovery and threat abatement strategy

Strategies developed since publication of the draft PAS are identified with an asterisk '\*'.

#### a. Recovery strategies

#### Assess threats and determine recovery strategies

For many animals and plants, there is little information about the nature and severity of the threats affecting them. An initial recovery strategy therefore is to identify and assess the threats and determine what recovery actions need to be implemented.

#### Survey/mapping and habitat assessment

Surveys are useful in:

- updating or confirming information about the distribution of a threatened species, by increasing knowledge of where the species is located and the habitats and land tenures it occupies
- clarifying understanding of the conservation status of a threatened species and the threats that may be operating at a site.

Surveys may benefit from the involvement of Aboriginal people to ensure that relevant cultural knowledge on species distribution is considered as well as the results of scientific assessments.

Mapping and habitat assessment enables:

- the locations or distribution of threatened species and their habitats to be more clearly interpreted
- habitats to be analysed
- predictive distributions of threatened species in the future to be modelled
- biologists to more effectively target surveys and predict where habitats may be situated and where recovery actions may be directed
- environmental managers to assess the significance and impacts of proposed developments or activities.

#### Monitoring

It is important to monitor key characteristics of a species or its habitat to ensure management actions are meeting their recovery objectives. For example, managers may monitor:

- changes to species abundance, for an assessment of population health
- predator numbers, to indicate the effectiveness of pest control programs

 water quality or vegetation understorey cover, to assess the condition of a species' preferred habitat.

Aboriginal people may wish to be involved in monitoring species they hold kinship associations for, or their habitats.

Over time, DECC intends to refine these monitoring actions into a multi-species and habitatbased monitoring and evaluation program.

#### Data recording and storage\*

The development and maintenance of systems that record the location of species or key components of their habitat is an essential part of threatened species management. Information gathered from survey, monitoring and mapping actions will often need to be verified or incorporated into databases such as the NSW Atlas of Wildlife (visit http://wildlifeatlas.nationalparks.nsw.gov.au/wildlifeatlas/watlas.jsp. Managers can use this information to implement site protection and restoration programs.

#### Habitat protection

Habitat protection enables an area that a threatened species occupies or primarily relies on to be conserved. Protection may be required where habitat is poorly represented in reserves or is under pressure from development or other land clearing or modifying activities. Several legislative mechanisms protect habitat. They include the listing of 'critical habitat', where DECC identifies habitat that is crucial to the survival of a 'critically endangered' or 'endangered' species, population or ecological community. Other mechanisms include voluntary conservation agreements between private landowners and DECC, and joint management agreements between public authorities and DECC, to permanently protect threatened species' habitat. An additional mechanism may be the acquisition of land to form part of a national park or reserve.

#### Habitat management: feral animal control

Feral animals such as rabbits, pigs, goats, wild dogs, cats and foxes pose a major threat to many threatened species. They compete for food and nest or roost sites; prey on adults, juveniles and eggs; and damage and degrade natural habitats and breeding sites. The impacts of some of these species are recognised as KTPs. The control of feral animals through targeted culling programs and exclusion at priority sites are therefore important actions for threatened species.

#### Habitat management: weed control

Weeds compete with native plants for resources such as light and nutrients, and can aggressively invade areas, displacing native plants and animals. The impacts of a number of weed species such as bitou bush (*Chrysanthemoides monilifera*) are identified as KTPs. The control of weeds at priority sites can help recover threatened species.

#### Habitat management: advice to consent and planning authorities

DECC advises authorities responsible for regional and local planning and development approvals on the implications and impacts of proposed development activities on threatened species and their habitats. DECC also informs and advises consultants and other investigators who assess the potential impacts of developments or activities, leading to better conservation outcomes for threatened species. Advice includes environmental impact assessment guidelines, survey guidelines and species profiles, and ongoing liaison and consultation on statutory obligations.

#### Habitat management: fire

Native animals and plants respond differently to fire. Some persist under a range of fire regimes. However, in many cases, fires that occur too frequently may harm species by killing them, preventing them from spreading, depleting the soil seedbank, or modifying their habitat. Planning for threatened species recovery in relation to fire may mean implementing variable fire regimes and excluding those that are detrimental. Fire management may involve

managing the impacts of wildfire and hazard reduction activities, such as slashing and mowing, to prevent these activities from impacting on species and their habitats.

Since publication of the draft PAS, DECC has standardised the actions that apply to this strategy so they more effectively integrate species recovery with fire management planning programs.

#### Habitat management: site protection

Habitats for threatened species often require protection from disturbances such as vehicles, over-visitation, roadside maintenance or feral animals. Site protection may involve restricting access to a site by installing fencing or bollards, or placing signs or markers along roads, tracks and utility easements. Aboriginal communities should be involved in decision making when site protection involves restricting access. It may be necessary to discuss balancing protecting threatened species with cultural issues.

#### Habitat management: grazing\*

Overgrazing by introduced animals such as goats, rabbits and domestic stock can severely damage habitat by causing vegetation to be modified and removed, soil to be compacted, waterholes to be trampled in and fouled, and weeds to be spread. These factors can lead to an overall decline in biodiversity and resilience of the entire ecosystem. Grazing pressure is also often associated with inappropriate fire regimes. In some cases, impacts from grazing may also be caused by native animals. Reducing the impacts of grazing involves excluding stock from key sites, managing access to waterholes and applying other strategic grazing practices.

#### Habitat management: water\*

The maintenance of river flow regimes and water quality are fundamental to good river health. Ecological processes which sustain native fish and frog populations, vegetation, wetlands and birdlife depend on such maintenance. Programs need to be developed that control inappropriate water flows and urban runoff which can result in increased erosion and sedimentation and reduction in water quality.

#### Habitat management: other

Habitat management includes other actions that are not currently part of a PAS strategy. These include developing best practice guidelines or standards for habitat management, pursuing incentive schemes and stewardship programs, preparing site management plans or managing issues such as erosion, subsidence or flooding. Over time, DECC will develop a broader range of strategies to incorporate these habitat management initiatives.

#### Habitat rehabilitation: restoration and regeneration

Habitat loss or modification for urban development and agricultural practices has been a major factor in the decline of many native plants and animals. Rehabilitation and regeneration of modified or lost habitat can help many threatened species continue to survive in the wild. Actions include planting local native plants to provide food, shelter and roosting sites, or bush regeneration to reduce the impact on native plants from weeds. Many local community groups are enhancing and restoring the natural environment and assisting in the continued survival and increase of native species.

#### **Disease and pathogens\***

Introduced microbes such as bacteria, viruses and fungi can seriously impact on the health of native plants and animals. They can be introduced into the environment through the illegal importation and release of introduced animals and plants, or transport of contaminated soil and other raw materials. The containment and elimination of these threats will rely on the development, implementation and enforcement of adequate quarantine and site hygiene protocols.

#### Utilisation (direct take)\*

The illegal harvesting of plants, capture of native animals and collection of natural features such as bushrock can dramatically reduce the abundance of local native populations. Direct loss of individual animals, particularly aquatic reptiles and marine mammals through entrapment in fishing nets or as by-catch, can cause severe impacts. Reducing the impacts of 'direct take' will involve a variety of actions including deterrence, community education and improvements to industry methods.

#### Community and landholder liaison, awareness and education

Threatened animals and plants occur across NSW and their continued survival in the wild is a collective partnership involving all land managers. Community support and involvement is crucial to the continued success of recovery programs, particularly for those species whose distribution predominantly occurs on private land.

Engaging community interest and participation ensures that important aspects of the ecology of species and threats facing them are understood, and provides opportunities to become locally involved with species recovery. Community liaison, awareness and education include on-site meetings and open days, and preparing and distributing species profiles, school resource kits, posters, fact sheets and other promotional materials.

#### Aboriginal liaison and interpretation

Aboriginal communities have a strong association with many threatened species through their cultural connections to the land, use of medicinal plants and bush tucker, as well as through kinship and spiritual relationships. These associations may vary in significance between the many communities in NSW. Helping threatened species recover will involve liaising with Aboriginal Elders and their communities to incorporate their knowledge and experience, and ensuring they are informed about proposed recovery actions. When Aboriginal people have cultural responsibilities or kinship obligations to protect a species, these people should be involved in determining recovery plans.

Aboriginal people's involvement in threatened species recovery enables them to fulfil cultural obligations to care for Country, maintain cultural traditions and practices and contribute to the wellbeing of their community. DECC has prepared guidelines to facilitate Aboriginal community involvement in threatened species recovery planning (English and Baker 2003).

Consultation with Aboriginal communities is a statutory requirement when preparing recovery plans, and has been a part of many approved plans. Aboriginal people will also be consulted to help recover other species where there is a known cultural association, for example the green turtle (*Chelonia mydas*), but where a recovery plan will not be prepared under the TSC Act. It is expected that the list of threatened species requiring Aboriginal liaison and interpretation as part of the recovery strategy will increase as partnerships with Aboriginal communities deepen.

#### Research

Research is needed to improve knowledge and understanding of threatened species and the factors influencing their survival, so informed management decisions can be made. PAS research actions include:

- general biological and ecological studies to help increase knowledge of a species' biology, ecology, habitat requirements or behaviour patterns. For example, research into a plant species' response to fire can help managers apply appropriate fire regimes, or understanding the reproductive requirements of a species can abate threats so populations remain viable.
- research into causes of decline to clarify understanding of the threats and consequences of threats impacting on species and to inform managers of solutions requiring implementation. For example, investigating the susceptibility of certain threatened plant species to pathogens such as *Phytophera* will result in the implementation of hygiene control measures or restricted site access.

 research into the design of strategies to enable recovery actions to be more effective. Strategies may include research into predator or disease control, methods for restoring degraded ecological communities, or methods for developing captive breeding or *ex-situ* propagation techniques (see below for definition of '*ex-situ* collection and propagation').

#### Captive husbandry or ex-situ collection and propagation

Captive husbandry involves breeding animals in a controlled environment to build up numbers when they have significantly declined in the wild, or where threats are so severe that the species can no longer survive in the wild. It involves collecting animals, establishing and maintaining appropriate facilities and developing a breeding program that may incorporate genetic management.

*Ex-situ* collection and propagation involves collecting, establishing, maintaining and growing seeds and plants in conditions other than the wild. It protects plant species from the loss of genetic material from unexpected local extinctions.

Since the draft PAS was released, DECC has standardised the actions that apply to *ex-situ* collection and propagation, and developed criteria for their selection. Now, DECC, and other government and research institutions, can more strategically plan for their seed collection programs, *ex-situ* living programs and research programs.

Both captive husbandry and *ex-situ* collection and propagation are precursors to other strategies such as translocation and reintroduction and are applied when species could become locally extinct in the wild.

#### **Translocation and reintroduction**

Translocation is the deliberate movement of individuals, or regenerative plant material, to supplement a wild population, reintroduce a species to an area in which it had become extinct, or in extreme situations, introduce a species to a location outside its former range. As species recovery aims to conserve plants and animals in the wild, translocation is generally only undertaken to ensure the continued survival of a species and may be utilised where a population is in danger of becoming locally extinct. Translocations have been used successfully for species such as the Nielson Park she-oak (*Allocasuarina portunensis*). Translocations should always be undertaken in accordance with relevant translocation policies.

#### **Conservation status review**

A conservation status review is a formal assessment of the ability of a threatened species to survive in the wild. If, following implementation of recovery actions, numbers or distribution of a species have been reasonably restored or the threats to its survival have been significantly diminished, the NSW Scientific Committee may reclassify the species, moving it to a category indicating a lower likelihood of extinction, for example, from 'endangered' to 'vulnerable'. Alternatively, investigations may reveal that a species is continuing to decline and needs reclassification to a higher level. A review of conservation status is often undertaken after recovery actions have been implemented, or if there has been a perceived increase or decline in species distribution and abundance.

#### **Recovery plan preparation**

A formal recovery plan will be required for threatened species that are iconic, or have complex conservation issues involving a suite of management actions, or require the input and agreement of multiple stakeholders including Aboriginal communities. Under the TSC Act, recovery plans may be prepared for a single or group of threatened species, or for part of the range of a species. DECC may also collaborate with the Commonwealth Government to prepare recovery plans for species listed as threatened under the EPBC Act.

Single-species recovery plans are most appropriate for species that have specific habitat requirements and threats. Multi-species recovery plans are most effective for two or more species from the same taxonomic group or geographic region that share a common threat or

threats. A part-range recovery plan may be suitable for broadly distributed species, where the threatening processes vary in type and severity across their range. Actions identified in recovery plans have been and will be incorporated with those in the PAS. DECC has identified a three-year program of ongoing recovery plan preparation in Table 3.

#### Coordinate the recovery or threat abatement program

Recovery or threat abatement teams are useful when recovery involves several stakeholders and land managers. Team coordinators will coordinate actions and liaise with stakeholders such as other government agencies, community members and scientists. Coordination enables PAS actions to be implemented in an efficient and cost-effective manner, particularly for species that have numerous and complex actions associated with them.

#### Prepare threat abatement plan

For some species, the major factor limiting their recovery is the ongoing impact of certain KTPs. This may particularly be the case when pest species prey on threatened species, degrade their habitat or compete with them for preferred habitat or food. The preparation and implementation of a threat abatement plan (TAP) to ameliorate the impacts of a particular KTP may be the most effective and efficient first step in recovering a threatened species. Another advantage of a TAP is that the recommended actions can benefit more than one species.

#### Develop and implement protocols and guidelines

Protocols and guidelines provide advice on how to best manage a species and enable recovery to be managed efficiently, cost effectively and consistently. This strategy is broad in scope and includes such actions as developing best practice guidelines, site management plans and codes of practice. The strategy is relevant for managers who have threatened species on their land.

#### Other action

Not all recovery actions fall neatly under the recovery strategies in the PAS. Actions in the 'other action' category include 'Assessment of forestry management prescriptions for species' and 'Assessment of social and economic benefits and costs of species conservation'. Over time, DECC will develop a more comprehensive list of recovery strategies that better accommodate the full range of actions.

#### b. Threat abatement strategies

#### Review and amend or adopt existing legislation and policies

Over half the KTPs listed in the TSC Act are also listed under the Commonwealth's EPBC Act. More than half again have either an approved or draft Commonwealth threat abatement plan (TAP) in place. Other KTPs have also been identified under other State, Commonwealth or international legislation and agreements, and active programs have been developed to resolve them. This threat abatement strategy aims to avoid duplication by adopting existing actions and plans. In some cases, the review may necessitate amendments to existing policies and programs before they can be adopted in NSW.

For example, beak and feather disease affecting endangered psittacine parrots, cockatoos and lorikeets has been listed as a KTP under the NSW and Commonwealth Acts, and a Commonwealth TAP has been prepared. DECC will review the TAP for adoption in NSW where appropriate. DECC is also involved in the NSW native vegetation reforms and amendments to the *Native Vegetation Act 2003*, and will be able to apply these reforms to address the clearing native vegetation KTP.

#### Develop and implement protocols and guidelines

Protocols and guidelines provide advice on specific KTPs and how best to abate, ameliorate or eliminate the impacts they have on threatened species. Such documents include environmental impact assessment guidelines, best practice guidelines, site management

plans, quarantine measures and codes of practice, and can relate to policy and procedures for strategy development and identification of specific control methods.

These documents provide technical and operational information to complement the legislation and policy instruments. Examples of such documents include the best practice guidelines for fox control incorporated in *NSW threat abatement plan for predation by the red fox* (Vulpes vulpes) (NPWS 2001a) and *Hygiene protocol for the control of disease in frogs* (NPWS 2001b).

### Establish management agreements with public authorities, CMAs and land managers/landowners

The successful management of KTPs and development of threat abatement strategies will require a coordinated approach between DECC and key stakeholders including DECC, other public authorities, CMAs, private organisations, Aboriginal communities, private landowners and land managers. Agreements between various stakeholders can be signed such as memorandums of understanding, joint management agreements or voluntary conservation agreements.

The purpose of such agreements will be to:

- develop skills and knowledge to manage threats
- integrate threat abatement strategies with the management activities of landowners and land managers
- ensure that KTPs and threat abatement strategies are considered in all aspects of environmental planning and assessment.

#### **Review evidence of impacts**

To develop a sound understanding of a KTP and its impacts on native fauna and flora to target control efforts and develop effective solutions, evidence relating to the KTP needs to be inspected. This will involve examining appropriate literature and consulting with experts, then developing a review which will:

- describe the KTP and its impacts
- establish where the impacts are likely to occur
- identify individual or suites of threatened species that would be affected at different sites
- identify gaps in knowledge to guide future research.

#### **Prioritise control actions**

Actions in a threat abatement program may need to be prioritised to direct efforts towards native biota or ecosystems that are most likely to be affected, and control areas where the most benefit will be obtained. For example, *NSW threat abatement plan for predation by the red fox* (Vulpes vulpes) (NPWS 2001a) and *NSW threat abatement plan – invasion of native plant communities by* Chrysanthemoides monilifera *(bitou bush and boneseed)* (DEC 2006b) have prioritised control on sites where the impacts on threatened species and communities are likely to be greatest.

#### **Undertake control actions**

For certain KTPs, DECC or other land managers will implement direct control actions such as lethal baiting of foxes (*Vulpes vulpes*) under *NSW threat abatement plan for predation by the red fox* (Vulpes vulpes) (NPWS 2001a), and removal of bitou bush (*Chrysanthemoides monilifera*) under *NSW threat abatement plan – invasion of native plant communities by* Chrysanthemoides monilifera (*bitou bush and boneseed*) (DEC 2006b).

#### Measure response to control

Measuring the response of the KTP and native biota to control strategies is required to:

- demonstrate the effects of the KTP and justify ongoing control
- provide a measure of effectiveness for ongoing management strategies.

For example, *NSW threat abatement plan for predation by the red fox* (Vulpes vulpes) (NPWS 2001a) includes 19 species-specific monitoring programs to measure the response of threatened species and foxes to fox control at priority sites. Specific monitoring programs have been developed for several species including the southern brown bandicoot (*Isoodon obesulus*), the little tern (*Sterna albifrons*) and the brush-tailed rock wallaby (*Petrogale penicillata*).

#### Research

This strategy provides for further research or scientific studies to:

- increase understanding of factors that modify KTPs, such as interaction with other KTPs and climate factors
- improve control methods, such as increasing cost-efficiency, improving target specificity or considering ethics.

Examples of research programs include:

- investigating the ecology of fire regimes in different ecosystems
- assessing the impact of burning and fire intensity on plant survival
- identifying new methods for vegetation mapping and modelling
- examining the efficacy of goat control programs.

Research may also include consultation and oral history recording with Aboriginal people to guide understanding of the changes in the land due to KTPs and to use traditional ecological knowledge in abatement planning.

Outcomes from research will enable land managers to develop threat abatement strategies and actions while ensuring that resources are used efficiently.

#### Survey/mapping and habitat assessment

To achieve effective management, it is important to understand the spatial distribution of a KTP, particularly in relation to threatened species it may affect. Therefore, it may be necessary to survey and map the KTP and threatened species at risk when information is inadequate. Surveying and mapping may include modelling for complex threats such as climate change, or to determine the potential distribution of new threats such as the recently introduced red fire ant (*Solenopsis invicta*).

#### Community and landholder liaison, awareness and education

The success of many threat abatement strategies will depend on establishing effective community and landholder awareness and education programs. In particular, there needs to be increased public awareness and understanding of KTPs, their impact on native biota and ecosystems and how the community and landholders can help manage threats.

Community and landholder education and awareness can be achieved by:

- distributing information to the public, for example, through brochures, fact sheets and the internet
- establishing good relationships with Aboriginal landholders and communities, and seeking their involvement in programs to manage KTPs
- encouraging the media to profile KTPs and ways that the community can help mitigate threats
- developing and promoting KTP education and information in consultation with community groups and integrating this with community-based programs such as Landcare, Bushcare, Land for Wildlife, Coastcare and Waterwatch
- creating opportunities for community and landholder involvement in threat abatement actions, for example, community members and landholders contribute enormously to the control of bitou bush (*Chrysanthemoides monilifera*) and monitoring the recovery of the southern brown bandicoot (*Isoodon obesulus*)
- facilitating implementation of priority control actions by liaising with landholders.

#### Prepare statement of intent

A statement of intent is a brief summary of the NSW government's response to a KTP. In particular, it outlines the threat abatement strategies that are required to abate a KTP and details the government's commitment to these strategies. A statement of intent will be prepared for all KTPs when a threat abatement plan will not be prepared (see below). Any decision not to prepare a threat abatement plan will be reviewed every three years in conjunction with the review of the PAS.

#### Prepare threat abatement plan (TAP)

A NSW threat abatement plan (TAP) is a statutory document prepared and approved under Part 5 of the TSC Act. A TAP will be prepared for each KTP where:

- the KTP significantly impacts on biodiversity or is the main threat to many species
- the KTP's impact varies depending on location
- there are various abatement strategies in other conservation planning documents and policy instruments that need to be combined in one document
- management of the threat requires coordination and commitment from several public authorities and stakeholders
- cost-effective management is available
- more coordinated effort is needed for the threat abatement program to build on existing initiatives or develop additional initiatives.

TAPs already prepared by DECC include *NSW threat abatement plan for predation by the red fox* (Vulpes vulpes) (NPWS 2001a), *Predation by* Gambusia holbrookii – *the plague minnow* (NPWS 2003) and *NSW threat abatement plan – invasion of native plant communities by* Chrysanthemoides monilifera (*bitou bush and boneseed*) (DEC 2006b).

A TAP will:

- describe the KTP and its impacts on native biota and ecosystems
- establish specific objectives to abate, ameliorate or eliminate the KTP
- outline the strategies and actions to achieve the objectives
- establish criteria for assessing the effectiveness of proposed actions in achieving the objectives
- identify the people or authorities who are responsible for implementing actions outlined in the plan
- give a cost estimate and timetable, if possible, for carrying out the plan.

#### Coordinate the recovery or threat abatement program

Recovery or threat abatement management teams are useful when recovery involves several stakeholders and land managers. Team coordinators will coordinate actions and liaise with stakeholders such as other government agencies, community members and scientists. Coordination enables PAS actions to be implemented in an efficient and cost-effective manner, particularly for species that have numerous and complex actions associated with them.

# Glossary

CMA:	catchment management authority established under the <i>Catchment Management Authorities Act 2003</i> and reporting to the NSW Minister for Climate Change, Environment and Water.		
Critical habitat:	habitat declared to be critical habitat under Part 3 of the <i>Threater</i> Species Conservation Act 1995.		
Critically endangered:	a species facing an extremely high risk of extinction in NSW in the immediate future.		
DECC:	Department of Environment and Climate Change.		
DECC park area	a national park or nature reserve managed by the Department of Environment and Climate Change		
Endangered species:	a species facing a very high risk of extinction in NSW		
Ex-situ:	out of location in the environment. Often applied to actions undertaken in relation to propagation and cultivation of plants or in relation to animals in captivity rather than in the wild.		
Extinct:	a species presumed extinct and specified as so in Part 4 of Schedule 1 of the <i>Threatened Species Conservation Act 1995</i> .		
Fauna:	any animal life that is indigenous to NSW or is known to periodically or occasionally migrate to NSW, whether vertebrate or invertebrate and in any stage of biological development, but does not include: (a) humans, or (b) fish within the meaning of Part 7A of the <i>Fisheries</i> <i>Management Act 1994</i> . <b>Note:</b> some types of fish may be included in the definition of 'animal'. See section 5A of the <i>Threatened Species</i> <i>Conservation Act 1995</i> .		
Flora:	any plant life that is indigenous to New South Wales, whether vascular or non-vascular (mosses, liverworts, lichens, algae and fungi) and in any stage of biological development, but does not include marine vegetation within the meaning of Part 7A of the <i>Fisheries Management Act 1994</i> . <b>Note:</b> some types of marine vegetation may be included in the definition of 'plant'. See section 5 of the <i>Threatened Species Conservation Act 1995</i> .		
Habitat:	an area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community and including any biotic (pertaining to animal or plant life) or abiotic component.		
Key threatening process:	a threatening process specified in Schedule 3 of the <i>Threatened Species Conservation Act 1995</i> that adversely affects threatened species, populations or ecological communities, or could cause those that are not threatened to become so.		
Native vegetation reform process	<ul> <li>is the package of reforms comprising the following:</li> <li>(a) the Native Vegetation Act 2003 and Regulations under that Act</li> <li>(b) state-wide standards and targets for natural resource management issues recommended under the Natural Resources Commission Act 2003 and adopted by the government</li> <li>(c) catchment action plans under the Catchment Management Authorities Act 2003</li> </ul>		

	(d)	protocols and guidelines adopted or made under the regulations under the <i>Native Vegetation Act 2003</i> , the <i>Catchment Management Authorities Act 2003</i> and the <i>Natural Resources Commission Act 2003</i> .
Population:	a gro area.	up of organisms, all of the same species, occupying a particular
Public authority:	any public or local authority constituted by or under an Act, a government department, a statutory body representing the Crown, or a state owned corporation, and includes a person exercising any function on behalf of the authority, department, body or corporation and any person prescribed by the regulations to be a public authority.	
Recovery plan:	a plar Spec	n prepared and approved under Part 4 of the <i>Threatened</i> ies Conservation Act 1995.
Threat:	a process that threatens, or may have the capability to threater survival or evolutionary development of species, populations of ecological communities.	
Threat abatement plan:	: a plar Spec	n prepared and approved under Part 5 of the <i>Threatened</i> ies Conservation Act 1995.
Threatened species, populations and ecological communities:	species, populations and ecological communities specified in Schedules 1, 1A and 2 of the <i>Threatened Species Conservation</i> <i>1995.</i> <b>Note</b> : In some cases vulnerable ecological communities are excluded from this expression. See subsection (5) of the Act.	
Vulnerable:	a spe medit	cies facing a high risk of extinction in New South Wales in the um-term future.

# **References and further reading**

DEC 2006a, A guide for managing community involvement in threatened species recovery, Department of Environment and Climate Change NSW, Sydney, visit www.environment.nsw. gov.au/threatspec/tscominvmanint.htm.

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NPWS 2001a, *Threat abatement plan for predation by the European red fox* (Vulpes vulpes), Department of Environment and Climate Change NSW, Sydney, visit www.nationalparks. nsw.gov.au/PDFs/Redfox\_approved.pdf

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NPWS 2001c, *Statewide prioritisation for recovery plan preparation. Policy and procedure statement no.* 8, Department of Environment and Climate Change NSW, Sydney.