



Australian Government

Department of the Environment

Threat abatement plan for predation,
habitat degradation, competition and
disease transmission by feral pigs
(*Sus scrofa*)



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INTRODUCTION

In 2001 the Australian Government listed '**Predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)**' as a key threatening process under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

This listing initiated the development of the first '*Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)*', which was made in 2005. The first threat abatement plan was reviewed in 2011. This revised threat abatement plan is considered to be a feasible, effective and efficient approach to abating the threat to Australia's biodiversity from feral pigs. It provides a national framework for feral pig management, research and education. It also aims to capture scientific research and other developments that have occurred since the first threat abatement plan was made, and capture changing priorities for feral pig management.

While this threat abatement plan aims primarily to abate the threat to key environmental assets (threatened species and ecological communities listed under the EPBC Act and other matters of national environmental significance), it also recognises that feral pigs have wider environmental impacts as well as social, cultural and economic impacts.

This document should be read in conjunction with the background document, which provides information about feral pigs, their impacts on the environment, their economic impacts and values, and their current management.

1. Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*)

1.1. Description of the process and its impacts

Feral pigs are found in all states and mainland territories of Australia, particularly in association with wetlands and riparian ecosystems. An estimate of the nation's feral pig population size is difficult to quantify as numbers fluctuate widely in response to wet and dry periods, and availability of food and water. In warmer areas of Australia, feral pigs' poor heat tolerance restricts their distribution to the vicinity of watercourses and floodplains. This factor is less critical in the more forest-covered parts of eastern and south-western Australia where they are more widespread.

Ecological parameters affected by feral pigs include plant species composition and succession, nutrient and water cycles, and water quality. Impacts can be direct, such as through predation and digging, or indirect through long-term changes in species composition. Impacts may be seasonally influenced, and vary across Australia with different habitats.

Feral pigs are opportunistic omnivores and will consume animal material including small mammals, birds, reptiles, frogs, crayfish, eggs, and carrion; earthworms and other invertebrates; underground fungi; and all parts of plants including the fruit, seeds, roots, tubers, bulbs and foliage. They are known to prey heavily on marine turtle nests on beaches and on aestivating ("dormant") freshwater turtles in dried wetlands. Feral pigs will vary their food consumption to match seasonal changes in food availability but, as they have a single stomach, they cannot feed solely on plant material and require a portion of animal material in their diet.

Habitat changes due to feral pigs include: destruction of plants, sometimes to the point of threatening the population viability of specific species through reduced or failed recruitment of new plants, or changing the floristic composition; alteration of soil structure through digging and rooting; increased invasion and spread of weeds through spreading seeds via faeces or in fur, or creating suitable habitat through soil enrichment with urine and faeces or ground disturbance; reduced water quality through disturbance of riparian zones and bodily wastes; and creation of habitat suitable for plant disease vectors.

Feral pigs provide reservoirs for endemic animal and plant diseases such as leptospirosis and brucellosis, which can cause birth defects, abortions and infertility in mammals; may be vectors of exotic diseases such as foot-and-mouth disease, should they ever reach Australia; and evidence is strengthening that they can spread exotic plant pathogens such as *Phytophthora cinnamomi*, which causes 'dieback', through soil movement on their feet and fur, and passing viable spores in their faeces.

1.2. Managing the threat

It is not possible to eradicate feral pigs from Australia with current resources and techniques, and it is unlikely to be possible to do so in the near future, as they are so widely established. As such, the focus of feral pig management must be on abatement of the impacts of established populations unless they are in small isolated areas (e.g. islands). There are a range of control methods available for feral pigs including trapping, aerial and ground shooting, poisoning, and fencing. Other techniques, including the use of Judas pigs, use of hunting dogs, coordination with commercial harvesters and habitat manipulation, can contribute to the control methods used.

Feral pigs are mobile animals that have very high rate of reproduction in good conditions. Managing environmental damage due to feral pigs requires an integrated and coordinated approach, often across a variety of land uses including national parks, reserves and agricultural lands.

Best-practice management of feral pigs must involve threat abatement not only for currently identified threatened species but also for other native species that may be affected by feral pig predation, habitat degradation, competition and disease transmission.

1.3 Threat abatement plans

This threat abatement plan sets out a suggested series of actions and strategies to manage feral pigs across the nation, as well as providing a suggested timeline and prioritisation. The actions are informed by the review of the previous threat abatement plan, new scientific research and developments, and input from feral pig experts.

1.3. Implementation

Under the EPBC Act, the Australian Government develops threat abatement plans and facilitates their implementation. The EPBC Act requires the Australian Government to implement threat abatement plans to the extent to which they apply in areas under Australian Government control and responsibility. In addition, Australian Government agencies must not take any actions that contravene a threat abatement plan. Where a threat abatement plan applies outside Australian Government areas in states or territories, the Australian Government must seek the cooperation of the affected jurisdictions, with a view to jointly implementing the threat abatement plan.

The Australian Government Department of the Environment will work with other Australian Government agencies and with state, territory and local governments, national and regional industry and community groups towards implementing this threat abatement plan. By providing

a national framework, this threat abatement plan will assist in the coordination and enhancement of relevant strategies and activities across affected jurisdictions.

Where feral pigs are a declared pest under a state or territory's regulations, the requirements for, and enforcement of, feral pig management actions are the responsibility of that state or territory.

This threat abatement plan provides guidance on the management of feral pigs in Australia, namely to:

- manage feral pigs within policy, legislative and planning frameworks
- reduce the spread of feral pigs to new areas within Australia
- manage feral pigs based on the protection of values and assets
- build Australia's capacity to address feral pig problems and improve feral pig management
- raise awareness and motivation among Australians to strengthen their commitment to act on feral pig problems, and
- monitor and evaluate the progress of Australia's feral pig management effort.

The successful implementation of this threat abatement plan will depend on a high level of cooperation between landholders, community groups, local government, state and territory conservation and pest management agencies, and the Australian Government and its agencies. Success will depend on all participants assessing feral pig impacts and allocating adequate resources to achieve effective on-ground control of feral pigs at critical sites, improve the effectiveness of control programs, and measure and assess outcomes. Various programs in natural resource management, at national, state and regional levels, can make significant contributions to implementing the plan.

2. Objectives and actions

The overarching goals of this threat abatement plan are to protect nationally listed threatened species and ecological communities from predation, habitat degradation, competition and disease transmission by feral pigs; **and** to prevent further species and ecological communities from becoming nationally threatened or extinct due to predation, habitat degradation, competition and disease transmission by feral pigs.

These goals can be achieved by improving our scientific understanding of the threatening process that feral pigs represent and its effects on native species and ecological communities, and improving management and control of feral pigs. To achieve these goals, the threat abatement plan has six main objectives that were developed in consultation with experts in relevant jurisdictions. These objectives are to:

1. encourage the integration of feral pig management into land management activities at regional, state and territory, and national levels
2. identify and prioritise key species, ecological communities, ecosystems and locations across Australia for strategic feral pig management
3. encourage further scientific research into feral pig impacts on nationally threatened, and near-threatened, species and ecological communities, as well as research into feral pig ecology
4. raise feral pig awareness among stakeholders and build capacity for feral pig management
5. improve public awareness about feral pigs and the problems they cause, and the need for feral pig control
6. record and monitor feral pig control programs, so their effectiveness can be evaluated.

Each objective is accompanied by a set of actions which, if implemented, will help to achieve the goals of the threat abatement plan. Performance indicators (outcomes and outputs) have been established for each objective. Reports on progress against the objectives may be sought by the Australian Government Department of the Environment in years 4–5 for the purpose of assessing the effectiveness of the threat abatement plan.

Objective 1: *Encourage the integration of feral pig management into land management activities at regional, state and territory, and national levels.*

Feral pigs are a serious pest and cause serious environmental damage; therefore, feral pig management should be regarded as a standard component of land management. In encouraging the integration of feral pig management into ongoing practices by land managers, the intent is to increase recognition that the problem requires long-term mitigation rather than occasional periods of action. Long-term suppression of feral pig numbers will assist in reducing the pressure on threatened species and ecological communities affected by feral pigs, hopefully to the degree that they are able to withstand the inevitable ongoing, low level impacts or occasional periods of higher level impacts.

Feral pigs are highly mobile across the landscape in response to changing conditions, so cooperation between land managers in broad scale management programs will benefit threatened species and ecological communities as well as limiting the damage to primary production impacted by pigs, including cropping and grazing enterprises. A well designed control program to suppress feral pig numbers will also provide a buffer on the ability of feral pigs to breed rapidly in ideal conditions. Integrating a feral pig management program into the standard land management activities of a property may allow managers to seek efficiencies through combining activities and some examples are provided below.

The integration of feral pig management into land management activities at all levels of government, in regional groups such as Natural Resource Management groups, Landcare groups, Local Land Services, and local groups such as “Friends of...” groups is encouraged.

Action	Priority/ timeframe	Outcome	Output	Responsibility
<p>Action 1.1: Encourage the integration of feral pig management into land management activities at all levels of government, and regional groups.</p> <p>For more consistent and effective feral pig management across Australia, all government departments and agencies with land management responsibilities aim to integrate feral pig management into their land management activities (e.g. weed control, threatened species surveying/recovery work, fuel reduction, etc.) and planning. Similarly, regional groups such as such as Natural Resource Management groups, Landcare groups and Local Land Services should aim to integrate feral pig management into their land management activities.</p>	<p>High priority</p> <p>Years 1–5</p> <p>(ongoing)</p>	<p>More consistent and effective feral pig management occurs across Australia at all levels of government, and in regional groups.</p> <p>Inclusion of actions to mitigate the impacts of feral pigs on threatened and near threatened species into land or property plans, for areas where feral pigs have been identified as a problem.</p>	<p>Reduction in environmental damage by feral pigs, where this can be measured.</p> <p>OR</p> <p>A reduction in feral pig populations as a proxy for reduced environment damage.</p>	Land managers.

Objective 2: Prioritise key species, ecological communities, ecosystems and locations across Australia for strategic feral pig management.

The key purpose of this threat abatement plan is to address the key threatening process; reducing predation, habitat degradation, competition and disease transmission by feral pigs. It is therefore necessary to identify the important ecosystems, habitats and species that may need protecting through research findings, qualitative assessments and stakeholder discussions.

For the Australian Government Department of the Environment, key species and ecosystems are those listed as threatened under the EPBC Act, and those near-threatened species and ecosystems at risk of becoming listed, for which feral pigs are a key threatening process. However, species, ecosystems and locations considered important for other reasons, or by other stakeholders (e.g. state-listed, culturally important, iconic) should be considered as well.

A list of EPBC-listed species and ecological communities negatively affected by feral pigs, and a list of priority areas (national parks and nature reserves) affected by feral pigs, compiled through discussion with state and territory governments, is included at Appendix A. In some cases, large areas or large national parks listed may need breaking down into finer scale regions for pig control purposes.

Identifying the locations of key species, ecological communities, and ecosystems under significant threat by feral pigs is an important foundation for Objective 1 of the threat abatement plan. Through knowing the key action areas requiring feral pig control and protection, land managers can more effectively integrate and prioritise feral pig management into their management activities and, where necessary, seek long-term funding. It will also provide these land managers with information about what feral pig control actions they can undertake and how to measure the effectiveness of these control actions.

Action	Priority/ timeframe	Outcome	Output	Responsibility
<p>Action 2.1: Identify key species, ecological communities, ecosystems and locations for priority protection and undertake action.</p> <p>Categorise the list of nationally threatened species and ecological communities based on:</p> <ul style="list-style-type: none"> (i) the degree of impact from feral pigs (ii) the degree to which targeted action would be most effective and efficient. <p>Correlate the categorised list from above with areas identified as high priority for feral pig control (Appendix A).</p> <p>Factor in other</p>	<p>High priority</p> <p>Years 1–2 with ongoing refinement where necessary</p>	<p>Key species, ecological communities, ecosystems and locations prioritised for protection and management.</p>	<p>Measurable reduction in feral pig damage to key species, ecological communities, ecosystems and locations.</p> <p>Linkages to recovery plans where they exist.</p>	<p>Categorisation to be undertaken by the Australian Government in consultation.</p> <p><i>This action will require careful consultation to ensure all priority factors are considered, and communication of priority species, ecological communities, ecosystems and locations to affected land managers.</i></p> <p>Implementation of feral pig control programs to be undertaken by land</p>

Action	Priority/ timeframe	Outcome	Output	Responsibility
<p>sites/species/ecosystems where appropriate (e.g. cultural, iconic).</p> <p>Implement management in the identified areas.</p>				managers.
<p>Action 2.2: Break down broader identified areas into finer scale management units that encompass distinct feral pig populations and/or situations that need high level pig control.</p>	<p>Medium priority</p> <p>Years 1–2</p>	<p>Small areas of high / special environmental value in need of feral pig management better identified.</p>	<p>Feral pig damage to small areas of high / significant environmental value measurably reduced.</p>	<p>Regional groups and land managers.</p> <p><i>This action will require the detailed understanding of habitats within regions and their relative importance across the region, which requires on-ground knowledge.</i></p>

Objective 3: *Encourage further scientific research into feral pig impacts on nationally threatened, and near-threatened, species and ecological communities, and feral pig ecology.*

Further experimental research is needed to quantify the environmental impacts of feral pigs, particularly their impacts on threatened species and ecological communities. Specifically:

- the relationship between the number of pigs and the level of impact (within specific areas and ecosystems) needs to be quantified where possible, to help land managers decide how much control effort is needed.
- the impacts of feral pigs in environments where they are abundant including temperate inland river/wetland complexes. It is noted some research has been conducted already in the Wet Tropics and sub-alpine peat bogs.
- understanding the landscape factors, and interactions between these landscape factors, that drive feral pigs' ecology and their interactions/impacts with the environment. This includes understanding how feral pigs use a variety of habitats or microhabitats in a landscape.
- the development of indicators for how and when to undertake feral pig control work for a particular region or ecosystem. These indicators may be developed as part of the research described above.

Importantly, further research should be undertaken into the effectiveness of feral pig control methods. The results of the research needs to be communicated to land managers undertaking control programs so that they can adapt their methods to have a better outcome for threatened species and ecological communities.

Understanding and quantifying the environmental impacts of feral pigs on threatened and near-threatened species and ecological communities works towards the goals of the threat abatement plan through providing a better understanding of how feral pigs can be controlled, or how other measures can be taken to lessen the impact of feral pigs.

Action	Priority/ timeframe	Outcome	Output	Responsibility
<p>Action 3.1: Further research into feral pigs impacts on nationally threatened, and near-threatened, species and ecological communities.</p> <p>This research will necessarily be focused on the native species or ecological community.</p> <p>Consideration for identified recovery actions should be included in developing research</p>	<p>High priority</p> <p>Years 1–5</p>	<p>Increase in feral pig research activity.</p> <p>Greater understanding of feral pig impacts on nationally threatened, and near-threatened, species and ecological communities.</p> <p>More informed and effective feral pig management.</p>	<p>Research papers and reports focused on understanding feral pig impacts on nationally threatened, and near-threatened, species and ecological communities published.</p> <p>Recovery plans, as they are updated, reflect the improved knowledge on feral pig management needs.</p>	<p>Researchers.</p> <p><i>As this type of research will require field studies, the involvement of local land managers and groups may provide valuable assistance.</i></p>

Action	Priority/ timeframe	Outcome	Output	Responsibility
proposals related to feral pigs.				
Action 3.2: Further research into feral pig population dynamics and ecology. A greater understanding of feral pig population dynamics and ecology will aid in feral pig management.	Medium priority Years 1–5	Improved knowledge leading to more informed and effective feral pig management.	Research papers and reports focused on understanding feral pig population dynamics and ecology published. Research translates into improved quality and currency of information/ guidance for land managers undertaking feral pig control programs.	Researchers. <i>As this type of research will require field studies, the involvement of local land managers and groups may provide valuable assistance.</i>
Action 3.3: Research into spatial and temporal use of landscapes by feral pigs. A greater understanding of how feral pig use of landscapes varies in time and space will aid feral pig management.	Medium priority Years 1–5	Improved knowledge leading to more informed and effective feral pig management.	Research papers and reports focused on understanding feral pig spatial and temporal landscape use published. Research translates into improved quality and currency of information/ guidance for land managers undertaking feral pig control programs.	Researchers. <i>As this type of research will require field studies, the involvement of local land managers and groups may provide valuable assistance.</i>
Action 3.4: Further research into the effectiveness of feral pig control methods	Medium priority Years 1–5	Improved knowledge leading to managers effectively applying control methods in a more efficient manner.	Research papers and reports focused on the effectiveness of control methods published. Research translated into easily accessible information for managers to adapt to their control programs.	Researchers and land managers. <i>This research will require field studies, and ideally be done in conjunction with local land managers and groups undertaking control programs.</i>
Action 3.4: Facilitate collaborative applied research that can be used to	Medium priority	Successful sponsored / collaborative projects	Reporting on projects demonstrates collaboration between	Researchers and funding organisations.

Action	Priority/ timeframe	Outcome	Output	Responsibility
inform or support improved management of feral pigs. Collaborative applied research projects may allow specific knowledge gaps to be targeted and filled, and bring additional benefits of knowledge exchange and connection.	Years 1–5	undertaken. Knowledge gaps filled.	organisations or key individuals.	

Objective 4: *Build capacity for feral pig management and raise feral pig awareness among stakeholders.*

Building capacity amongst stakeholders will enable them to undertake feral pig management more effectively and confidently. Raising awareness of feral pigs and their environmental impacts among stakeholders may increase support for management and control measures.

There are many diverse views within the community on the value of feral pigs, and these may also vary within groups over time or location. There is an understanding of these views – see the background document for details – but further understanding how these values may be respected while also undertaking appropriate feral pig management to achieve recovery of threatened species and ecological communities is needed.

Building capacity in feral pig management links to the goals of the threat abatement plan through providing support for stakeholders undertaking action for the purpose of protecting threatened and near-threatened species and ecological communities.

Action	Priority/ timeframe	Outcome	Output	Responsibility
Action 4.1: Increase delivery of training courses and/or extension programs to build feral pig management skills amongst landholders and other stakeholders. Training courses / extension programs will acquaint	High priority Years 1–5	Increased capability to manage feral pigs amongst stakeholders. More feral pig management undertaken by stakeholders.	Formal vocational training courses (e.g. Certificate III in Vertebrate Pest Management) available in all states and territories. Where records are available, the ongoing delivery of vertebrate pest management information or training at agricultural and town shows, field days	TAFEs, universities, organisations delivering agricultural and natural resource management advice (e.g. Natural Resource Management, Local Land Services, state and territory government departments). <i>Delivery of training takes place formally through courses or workshops and</i>

Action	Priority/ timeframe	Outcome	Output	Responsibility
participants with: <ul style="list-style-type: none"> • current pig management products and techniques • relevant legislation • codes of practice and standard operating procedures • the value of monitoring, and basic techniques for monitoring. 			and public meetings. Ongoing access of feral pig training material available on the www.feral.org.au website (developed by the Invasive Animals Cooperative Research Centre).	<i>informally through agricultural and town shows, field days and public meetings.</i>
Action 4.2: Increase understanding of social impediments to feral pig control	Medium priority Years 1–5	Feral pig management programs tailored to community and threatened species/ ecological community requirements.	Guidance available to land managers undertaking control programs. This may be delivered as a component of training courses or extension programs in Action 4.1.	Researchers in association with TAFEs, universities, organisations delivering agricultural and natural resource management advice.

Objective 5: *Improve public awareness about feral pigs and the environmental damage and problems they cause, and the need for the feral pig control.*

Most Australians now live in urban or semi-urban areas. They generally do not see feral pigs and are rarely confronted by the damage and problems caused by feral pigs. Consequently, most Australians lack awareness of the feral pig problem, and may have no concept of the need for feral pig control. It is important to improve public awareness about feral pigs and the environmental damage and problems they cause, and the need for feral pig control, to ensure there is lasting public support for management and research.

Feral pigs also impact on primary production through predation on livestock, damage to crops and through harbouring diseases that may affect livestock. These diseases may also affect humans and secondary impacts from feral pigs, such as water quality in supply catchments, can also cause human health issues. While these are not the focus of this threat abatement plan, educating people about these issues can lend support to feral pig control for biodiversity outcomes.

Action	Priority/ timeframe	Outcome	Output	Responsibility
<p>Action 5.1: Develop and deliver a public education program about feral pigs and the environmental damage and problems they cause.</p> <p>Raising public awareness of feral pigs is necessary. Where opportunities arise, such as in conjunction with feral pig management programs or as a component of a broader program raising awareness of invasive/feral animals generally, a public education campaign can be run.</p>	<p>Lower priority</p> <p>Years 1–5</p>	<p>Greater public awareness of the environmental damage feral pigs cause, and the problems feral pigs cause to both the environment and primary producers.</p> <p>Public support is forthcoming for funding feral pig control programs.</p>	<p>Media monitoring shows an increase in stories/articles or awareness of the feral pig problem</p> <p>AND/OR</p> <p>Public surveys on the environment indicate an awareness of the feral pig problem.</p>	<p>Australian, state and territory biosecurity agencies.</p> <p>Specific control programs should deliver education in local areas as appropriate.</p>

Objective 6: Record and monitor feral pig control programs, so their effectiveness can be evaluated.

There is a need to record and monitor feral pig control programs, so that their effectiveness can be evaluated. Feral pig control programs should include monitoring of specific sites within the area of the control program for evaluation purposes. Ideally this information would be publicly accessible, possibly from a single point (e.g. website) so that stakeholders and managers across Australia can find out when and where feral pig control programs are happening and how effective they have been.

Action	Priority/ timeframe	Outcome	Output	Responsibility
<p>Action 6.1: Encourage monitoring to enable the evaluation of the effectiveness of feral pig control.</p> <p>Monitoring of appropriately chosen sites will allow the effectiveness of feral pig control to be evaluated, and will allow land managers to change feral pig control actions as necessary.</p> <p>Sharing information on effectiveness of control actions will allow other land managers to learn from it.</p>	<p>High priority</p> <p>Years 1–5</p>	<p>Feral pig control actions include site monitoring and effectiveness.</p>	<p>Information to refine feral pig control actions</p>	<p>Land managers undertaking control programs or contractors working for land managers.</p>
<p>Action 6.2: Investigate centralised recording of feral pig control actions and any monitoring/recording of their effectiveness.</p> <p>An understanding of how, where and when feral pig control programs are being undertaken may provide regions with the potential to collaborate to achieve enhanced control. This understanding will also provide a national picture of feral pig control and its effectiveness.</p> <p><i>These investigations will need to consider issues of data quality, particularly where there are elements of self-censorship for external reasons. These may include concerns about illegal hunting or interference with control programs.</i></p>	<p>Medium priority</p> <p>Years 1–5</p>	<p>Investigate the feasibility of a centralised recording of feral pig control programs.</p>	<p>Data on where and how feral pigs are controlled available for regional, state/territory and national planning and prioritisation.</p>	<p>Australian, state and territory governments to determine feasibility.</p> <p><i>If this is implemented land managers will need to provide information.</i></p>

3. Duration, cost and evaluation

3.1. Duration and cost

This threat abatement plan provides guidance to identify priority areas and undertake actions targeted at these areas. Investment in many of the actions listed in this threat abatement plan will be determined by the level of resources that stakeholders commit to managing the problem.

Budgetary and other constraints may affect the achievement of the objectives of this threat abatement plan and, as knowledge changes, proposed actions may be modified over the ten-year life of the threat abatement plan. Australian Government funds may be available to implement key national environmental priorities, such as relevant actions listed in this threat abatement plan and actions identified in regional natural resource management plans that are consistent with this threat abatement plan. Achievement of the overarching goal of the threat abatement plan will require ongoing management beyond the life of the threat abatement plan. Ongoing support by all partners is therefore essential.

3.2. Evaluating the implementation of the threat abatement plan

Section 279 of the EPBC Act provides for the review of threat abatement plans at any time, and requires that threat abatement plans be reviewed at intervals of not longer than five years. Recommendations from any reviews are to be used to inform the development of the revised threat abatement plan if necessary.

GLOSSARY

EPBC Act	The <i>Environment Protection and Biodiversity Conservation Act 1999</i> , the Australian Government's environment legislation.
Key threatening process	<p>A threatening process listed under the EPBC Act that meets any of the following criteria:</p> <ul style="list-style-type: none">• could cause a native species or an ecological community to become eligible for listing in any category, other than conservation dependent• could cause a listed threatened species or a listed threatened ecological community to become eligible to be listed in another category representing a higher degree of endangerment• adversely affects two or more listed threatened species (other than conservation dependent species) or two or more listed threatened ecological communities.
Threatened ecological community	An ecological community listed under the EPBC Act as being critically endangered, endangered or vulnerable.
Threatened species	A species listed under the EPBC Act as being critically endangered, endangered, vulnerable or conservation dependent.

APPENDIX A: THREATENED SPECIES, ECOLOGICAL COMMUNITIES AND AREAS/REGIONS

The Threatened Species Scientific Committee (TSSC), which advises the Commonwealth Environment Minister on the listing of threatened species and ecological communities, identified that this threatening process—predation, habitat degradation, competition and disease transmission by feral pigs—adversely affects at least eighteen nationally listed threatened species, including:

- two mammals—northern bettong (*Bettongia tropica*) and long-footed potoroo (*Potorous longipes*)
- three frogs—white-bellied frog (*Geocrinia alba*), orange-bellied frog (*Geocrinia vitellina*) and the southern corroboree frog (*Pseudophryne corroboree*)
- three birds—southern cassowary (*Casuarius casuarius johnsoni*), black-breasted button-quail (*Turnix melanogaster*) and eastern bristlebird (*Dasyornis brachypterus*);
- one fish—red-finned blue-eye (*Scaturiginichthys vermeilipinnis*)
- two turtles—hawksbill turtle (*Ereimochelys imbricata*) and flatback turtle (*Natator depressus*)
- eight plants—elegant spider-orchid (*Caladenia elegans*), salt pipe-wort (*Eriocaulon carsonii*), lesser swamp-orchid (*Phaius australis*), greater swamp-orchid (*Phaius tancarvilleae*), Northampton midget orchid (*Pterostylis* sp. Northampton), Darwin palm (*Ptychosperma bleeseri*), majestic spider-orchid (*Caladenia winfieldii*) and reedia (*Reedia spathacea*).

The non-EPBC-listed bird species cotton pygmy goose (*Nettapus coromandelianus*) and the Burdekin duck (*Tadorna radjah*), have also been identified by the Department of the Environment as being adversely affected by feral pigs.

The Australian Government Department of the Environment's databases record 142 listed threatened species and ecological communities as being affected by feral pigs. In order to target feral pig management to key sites, such as from within the list of the high priority areas, it is necessary to identify which of the threatened species are significantly impacted by feral pigs. This may include examples such as turtles impacted by feral pigs eating their eggs, alpine bog destruction impacting on frogs, or specific plants being selectively eaten by feral pigs.

Mapping showing the number of threatened species and ecological communities impacted on, or potentially impacted on, by feral pigs within their current range is available at <http://www.environment.gov.au/topics/biodiversity/invasive-species/feral-animals-australia/feral-pigs>.

State and territory governments provided the following priority areas for feral pig control in 2010 as part of a review by the Department of the Environment of the *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs*. State and territory governments have identified 86 areas that are high in biodiversity, are impacted by feral pigs, and where pigs are potentially eradicable or are able to be reduced to a low level of impact (the 86 areas include 30 Victorian national parks). These are listed below.

Australian Capital Territory

1. Alpine sphagnum bogs and associated fens ecological community. Includes the Ramsar-listed Ginini Flats wetland complex within Namadgi National Park
2. White box–yellow box–Blakely's red gum grassy woodland and derived native grassland

New South Wales

3. Paroo River Wetlands
4. Kosciuszko alpine sphagnum bogs
5. Macquarie Marshes
6. Narran Lake
7. Lowbidgee Wetlands
8. Kanangra–Boyd and Yerranderie National Parks

Northern Territory

The Northern Territory is particularly focused on islands, where the likelihood of eradication or containment of feral pigs is very high.

9. Tiwi Islands
10. Cobourg Peninsula
11. Croker Island
12. Elcho Island
13. Arnhem Land (including around coastal areas)
14. Dhimurru and Laynhapuy Indigenous Protected Areas
15. Blue Mud Bay coastline extending around to and including Kakadu National Park

Queensland

16. Moreton Island
17. Currawinya National Park, south-east corner of Bulloo Shire
18. Cape York: Cook and Arakuun Shires
19. Bowling Green Bay National Park near Townsville
20. Lake Eyre Basin rivers (e.g. Cooper Creek and tributaries, Georgina and Diamantina systems), Shires of Boulia, Diamantina, Barcoo and Bulloo and the far western portion of Quilpie Shire
21. Border Rivers Goondiwindi Shire
22. Wet Tropics

South Australia

- 23. Western end of Kangaroo Island
- 24. Chowilla Floodplain
- 25. Cooper Creek

Victoria

- 26. Murray Scroll Belt Bioregion
- 27. Chiltern–Mt Pilot National Park
- 28. Brisbane Ranges National Park
- 29. Lerderderg State Park
- 30. Kinglake National Park
- 31. Mount Samaria State Park
- 32. Johnson Swamp Wildlife Reserve
- 33. Reedy Lake, Nagambie Wildlife Reserve
- 34. Mount Alexander Regional Park
- 35. Barmah State Park
- 36. Terrick Terrick National Park
- 37. Mornington Peninsula National Park
- 38. Burrowa–Pine Mountain National Park
- 39. Alpine National Park
- 40. Mount Lawson State Park
- 41. Little Bog Creek Flora and Fauna Reserve
- 42. Ewing Morass Wildlife Reserve
- 43. Alfred National Park
- 44. Croajingolong National Park
- 45. Snowy River National Park
- 46. Coopracambra National Park
- 47. Errinundra National Park
- 48. Holey Plains State Park
- 49. Cape Conran Coastal Park
- 50. Gippsland Lakes Coastal Park
- 51. Lake Tyers State Park
- 52. Mount Buangor State Park
- 53. Discovery Bay Coastal Park
- 54. Kings Billabong Wildlife Reserve
- 55. Hattah–Kulkyne National Park
- 56. Murray–Sunset National Park
- 57. Murray–Kulkyne National Park

Western Australia

58. Dongolocking reserves region, Shire of Wagin and Shire of Dumbleyung
59. Lake Bryde, Lake Grace Shire and Kent Shire Reserves
60. Lake Toolibin Nature Reserve
61. Wandering–Hotham Nature Reserve
62. State Forest areas of the South West of WA
63. Shannon National Park
64. D'Entrecasteaux National Park
65. Conservation areas covered by the Walpole Wilderness and Adjacent Reserves Management Plan #67
66. Lake Muir Nature Reserve and National Park including Lake Muir–Byenup Ramsar Site
67. Jane National Park Conservation areas covered by the Perup Management Plan #72
68. Blackwood River National Park
69. Forest Grove National Park
70. Location 83 National Park
71. Wellington National Park
72. Lane Pool Nature Reserve
73. Waterloo Nature Reserve
74. Kalbarri National Park
75. Lesueur National Park
76. Beekeeper's Nature Reserve
77. Moresby Range Conservation Park
78. Howatharra Nature Reserve
79. Oakagee Nature Reserve
80. Bella Vista Nature Reserve
81. East Yuna / McGauran Hills Nature reserve
82. Binda Hill Nature Reserve
83. Burma road Nature reserve
84. Badgingarra National Park
85. North Kimberley IBRA
86. Fitzroy Valley Catchment

(Feral pig impacts in Western Australia are not limited to these areas)