COMMONWEALTH OF AUSTRALIA

Environment Protection and Biodiversity Conservation Act 1999

Making of a Threat Abatement Plan – Section 270B

I, JOSH FRYDENBERG, Minister for the Environment and Energy, pursuant to section 270B of the *Environment Protection and Biodiversity Conservation Act 1999* have decided to make the *Threat abatement plan for predation, habit degradation, competition and disease transmission by feral pigs (Sus scrofa)(2017)*, for the purpose of reducing the effect of the key threatening process as specified below:

Key Threatening Process	**Threat Abatement Plan**
Predation, habit degradation, competition and disease transmission by feral pigs *(Sus scrofa)*	Department of the Environment and Energy (2017). *Threat abatement plan for predation, habit degradation, competition and disease transmission by feral pigs (Sus scrofa)*

The *Threat abatement plan for predation, habit degradation, competition and disease transmission by feral pigs (Sus scrofa) (2017)* will come into force on the day after the plan is registered on the Federal Register of Legislation.

Dated this 19th day of February 2017.

JOSH FRYDENBERG

Minister for the Environment and Energy

Australian Government

Department of the Environment and Energy

Threat Abatement Plan

for

predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*) (2017)

Cover photo: A mob of 89 feral pigs (some out of frame) on the Wildman River floodplain, Northern Territory, 2013. Photographer: B. Salau.

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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 '*Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa) (2005)'* which was made in 2005 and reviewed in 2011. This revised plan 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, their economic and social values, and their current management.

1. Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (*Sus scrofa*) (2017)

1.1. Description of the process and its impacts

Feral pigs are found in all states and territories of Australia, particularly in association with wetlands and river systems. An estimate of the size of the nation's feral pig population is difficult 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 forested 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. Feral pigs vary their food consumption to match seasonal changes in food availability and quality. They have a poor capacity to digest cellulose and relatively high protein requirements, therefore regularly supplement their diet with carrion and animal prey.

Habitat changes due to feral pigs include: destruction of plants, sometimes threatening the survival of specific plant species through reduced or failed recruitment of new plants; changing the composition of plant communities; 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 diseases such as leptospirosis and brucellosis, which can cause birth defects, abortions and infertility in mammals. They may be vectors of exotic diseases such as foot-and-mouth disease, should they ever reach Australia. They can spread exotic plant pathogens such as *Phytophthora cinnamomi,* which causes plant dieback, through soil movement on their feet and fur, and by passing viable spores in their faeces.

For further detail, consult the Background document.

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 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 unless they are in small isolated areas (e.g. islands) where eradication may be feasible. 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 tracking dogs to detect and flush out (but not attack) feral pigs[1], coordination with commercial harvesters and habitat manipulation (e.g. reducing watering points and/or crop waste for feral pigs to utilise), can contribute to the control methods used.

Feral pigs are mobile animals that have a very high rate of reproduction, particularly 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 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 the impacts of feral pigs across the nation, as well as providing a suggested timeline and prioritisation for activities. The actions are informed by the review of the previous threat abatement plan, new scientific research and developments, and input from feral pig experts.

1.4. 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. 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 and Energy will assist other Australian Government agencies and 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

[1] Regulations on the use of dogs in hunting vary in each jurisdiction. Nationally agreed Standard Operating Procedures and Codes of Conduct regarding feral pig control and some state legislation (e.g. Victoria) dictate that use of dogs must be restricted to detecting and flushing out feral pigs, and that dogs **must not** be encouraged nor allowed to attack feral pigs.

enhancement of relevant strategies and activities across affected jurisdictions.

This threat abatement plan provides a strategic framework for 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, including via illegal releases
- 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 relevant agencies. Success will depend on all participants assessing feral pig impacts and allocating adequate resources through available funding channels, programs, etc. to achieve effective on-ground control of feral pigs at critical sites, improve the effectiveness and humaneness 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.

This threat abatement plan acknowledges the principles for effective pest animal management enshrined in the Australian Pest Animal Strategy (http://www.environment.gov.au/biodiversity/invasive-species/publications/australian-pest-animal-strategy).

2. Objectives and actions

The overarching goals of this threat abatement plan are to **prevent further species and ecological communities from becoming threatened or extinct due to predation, habitat degradation, competition and disease transmission by feral pigs, and to improve protection for EPBC-listed species and ecological communities currently threatened by feral pigs**. A reduction in the total number of EPBC-listed species and ecological communities threatened by feral pigs is also desirable but may be unlikely due to the extremely high and ongoing level of pig control this would require.

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 objectives that were developed in consultation with experts in relevant jurisdictions. These objectives are to:

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

2. Encourage the integration of feral pig management into land management activities at regional, state and territory, and national levels

3. Encourage further scientific research into feral pig impacts on nationally threatened species and ecological communities, and feral pig ecology and control

4. Record and monitor feral pig control programs, so their effectiveness can be evaluated

5. Build capacity for feral pig management and raise feral pig awareness amongst landholders and land managers, and

6. Improve public awareness about feral pigs and the environmental damage and problems they cause, and the need for the feral pig control.

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 and Energy in years 4–5 for the purpose of assessing the effectiveness of the threat abatement plan.

Objective 1: 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—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/landholder discussions.

From the perspective of the Australian Government Department of the Environment and Energy, the key species and ecosystems are those listed as threatened under the EPBC Act, for which feral pigs are a key threatening process. A list of EPBC-listed species and ecological communities negatively affected by feral pigs is at Appendix B.

The Department of the Environment and Energy has also attempted to provide some recognition in this threat abatement plan for species and ecosystems that are currently unlisted and do not trigger specific attention under the EPBC Act, but are at risk of becoming listed under the EPBC Act if feral pig impacts continue. Similarly, species, ecosystems and locations considered important for other reasons, or by other stakeholders (e.g. state-listed, culturally important, iconic) should also be taken into consideration when planning feral pig programs.

Identifying the locations of key species, ecological communities, and ecosystems under significant threat by feral pigs is an important foundation for Objective 1. Through knowing the key 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	Key Actioners
Action 1.1: Identify key species, ecological communities, ecosystems and locations for priority protection. Note EPBC-listed threatened species and ecological communities. Factor in other sites/species/ecosystems where appropriate (e.g. cultural, iconic).	High priority. Years 1–2 with ongoing refinement where necessary.	Key species, ecological communities, ecosystems and locations prioritised for protection and management. Linkages to recovery plans or pest management strategies where they exist or are made.	Spatially explicit report that identifies priority areas for pig control.	To be undertaken by the Australian Government and other land managers in consultation with experts. *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.*
Action 1.2: Implement feral pig control in priority areas, combining national priorities and local	Medium priority.	Small areas of high / special environmental value in need of	Feral pig damage to small areas of high / significant	Regional groups and land managers. *This action will require*

Action	Priority/ Timeframe	Outcome	Output	Key Actioners
knowledge into on-ground action.	Years 1–2.	feral pig management better identified.	environmental value measurably reduced.	*the detailed understanding of habitats within regions and their relative importance across the region, which requires on-ground knowledge.*

Objective 2: 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 extensive damage to natural habitats as well as to agricultural industries. 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 and increase the resilience of these species and communities.

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 feral pigs, including cropping and grazing enterprises. A well designed control program will reduce the ability of feral pig populations to reach high densities during favourable 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. Some examples are provided below. All levels of government; regional groups such as Natural Resource Management groups, Landcare groups; state land service agencies (e.g. Local Land Services (NSW)); and local groups such as "Friends of..." groups are encouraged to integrate feral pig management into land management activities.

Action	Priority/ Timeframe	Outcome	Output	Key Actioners
Action 2.1: Encourage the integration of feral pig management into land management activities at all levels of government, and regional groups. For more consistent and effective feral pig management across Australia, all government departments and agencies with land management responsibilities should 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 Natural Resource Management groups, Landcare groups and Local Land Services should aim to integrate feral pig management into their land management activities.	High priority. Years 1–5. (ongoing)	More consistent and effective feral pig management occurs across Australia at all levels of government, and in regional groups. Inclusion of actions to mitigate the impacts of feral pigs on key species, ecological communities and ecosystems into land or property plans, for areas where feral pigs have been identified as a problem.	Reduction in environmental damage by feral pigs. AND/OR A reduction in feral pig populations as a proxy for reduced environment damage. Increased participation of groups and individuals in feral pig management.	Land managers.

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

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, and research into their transient movements following wet seasons or inland water flows (e.g. Channel Country), and
- the development of indicators for how and when to undertake feral pig control work for a particular region or ecosystem. These indicators need to include triggers related to space and time, and 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 this research need to be communicated to land managers so that they can adopt these methods and achieve better outcomes for threatened species and ecological communities. Collaborative applied research projects may allow specific knowledge gaps to be targeted and filled, and bring additional benefits of knowledge exchange and connection.

Understanding and quantifying the environmental impacts of feral pigs on threatened species and ecological communities works towards the goals of the threat abatement plan, by 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. Understanding the potential opportunities for range expansion and population growth and therefore impacts across all areas of Australia, particularly south-eastern Australia, will also be important.

Action	Priority/ Timeframe	Outcome	Output	Key Actioners
Action 3.1: Research into feral pigs impacts on nationally threatened, and near-threatened, species and ecological communities. Identified recovery actions should be included in research proposals related to feral pigs.	High priority. Years 1–5.	Increase in feral pig research activity. Greater understanding of feral pig impacts on nationally threatened, and near-threatened, species and ecological communities. More informed and effective feral pig management.	Research papers and reports focused on understanding feral pig impacts on nationally threatened, and near-threatened, species and ecological communities published. Recovery plans, as they are updated, reflect the improved knowledge of feral pig management needs.	Commonwealth, state and territory agencies funding or commissioning research. Researchers. *As this type of research will require field studies, the involvement of local land managers and groups may provide valuable assistance.*

Action	Priority/ Timeframe	Outcome	Output	Key Actioners
Action 3.2: 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.	Commonwealth, state and territory agencies funding or commissioning research. Researchers. *As this type of research will require field studies, the involvement of local land managers and groups may provide valuable assistance.*
Action 3.3: Research into spatial and temporal use of landscapes by feral pigs. A greater understanding of feral pigs' use of the landscape and how it varies spatially and over time will aid feral pig management.	Medium priority. Years 1–5.	Improved knowledge leading to more informed and effective feral pig management. Improved knowledge to target appropriate timing for feral pig management or placement of control techniques.	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.	Commonwealth, state and territory agencies funding or commissioning research. Researchers. *As this type of research will require field studies, the involvement of local land managers and groups may provide valuable assistance.*
Action 3.4: 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 adopt in their control programs.	Commonwealth, state and territory agencies funding or commissioning research. Researchers and land managers. *This research will require field studies, and ideally be done in conjunction with local land managers and groups undertaking control programs.*

Objective 4: Record and monitor feral pig control programs, so their effectiveness can be evaluated.

Feral pig control programs need to be recorded and monitored, where possible, so that their effectiveness can be evaluated. National recording of this monitoring data should be encouraged, as it allows state and territory agencies and other stakeholders/land managers across Australia to find out where and when feral pig control programs are carried out, how effective they are, and increases opportunities for collaborative control efforts. An existing platform that fulfils many of these functions is FeralPigScan (www.feralscan.org.au/feralpigscan/). FeralPigScan allows recording and mapping of feral pigs sightings and damage, as well as feral pig control activities occurring in local community areas. The data recorded is available to the community to help decide where to undertake control, and coordinate with neighbours.

Action	Priority/ timeframe	Outcome	Output	Key Actioners
Action 4.1: Encourage monitoring to enable the evaluation of the effectiveness of feral pig control. 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. In particular, monitoring of threatened species/ecological communities being impacted by feral pigs can determine whether changes in feral pig abundance caused by feral pig control are resulting in a positive response in those threatened species/ecological communities. Sharing information on effectiveness of control actions will allow other land managers to learn from it.	High priority. Years 1–5.	Feral pig control actions include site monitoring and effectiveness. Increased use of FeralPigScan to improve this platform's information base and usefulness.	Information to refine feral pig control actions.	Land managers undertaking control programs or contractors working for land managers.
Action 4.2: Develop further effective monitoring techniques.	High priority.	Effective monitoring techniques that can be used by non-specialist land managers.	Information to judge the effectiveness of feral pig control techniques.	State and territory agencies. Research institutions.

Action	Priority/ timeframe	Outcome	Output	Key Actioners
Action 4.3: Encourage the use of the existing FeralPigScan platform for centralised recording platform of feral pig control actions and any monitoring/recording of their effectiveness. *Issues of data standards, data security and data access may need to be considered.*	Medium priority. Years 1–5.	Increased use of FeralPigScan to improve this platform's information base and usefulness.	Data on where and how feral pigs are controlled available for regional, state/territory and national planning and prioritisation.	Australian, state and territory governments to determine feasibility. *If this is implemented land managers will need to provide information.*

Objective 5: Build capacity for feral pig management and raise feral pig awareness amongst landholders and land managers.

Building capacity amongst landholders and land managers will enable them to undertake feral pig management more effectively and confidently. Raising awareness of feral pigs and their environmental impacts amongst landholders and managers will also increase their support for, and participation in, management and control measures. Measures for achieving this will include effectively communicating the outcomes of research.

Building capacity in feral pig management links to the goals of the threat abatement plan by providing support for landholders protecting threatened species and ecological communities.

There are many diverse views within the broader community, including Indigenous communities, on the value of feral pigs, and these may also vary within groups over time or location (See Background document for detail). Further understanding on how these values may be respected while also undertaking appropriate feral pig management is needed.

It is also important to recognise the significant expertise some land managers, including Indigenous land managers, have from many years of on-the-ground experience managing feral pigs, and creating opportunities for the sharing, exchange and capturing of this knowledge.

Action	Priority/ timeframe	Outcome	Output	Key Actioners
Action 5.1: Increase delivery of training courses and/or extension programs to build feral pig management skills amongst landholders and land managers Training courses / extension programs will acquaint participants with: • current humane feral pig management products and techniques • relevant legislation, including animal welfare legislation • codes of practice and standard operating	High priority. Years 1–5.	Increased capability to manage feral pigs amongst landholders and land managers. More feral pig management undertaken by landholders and land managers.	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 and public meetings. Ongoing access of feral pig training material available on the PestSmart Connect website (http://www.pestsmart.org.au/) (developed by the Invasive Animals Cooperative Research Centre).	TAFEs, universities, organisations delivering agricultural and natural resource management advice (e.g. Natural Resource Management, Local Land Services, state and territory government departments). *Delivery of training takes place formally through courses or workshops and informally through agricultural and town shows, field days and public meetings.*

Action	Priority/ timeframe	Outcome	Output	Key Actioners
procedures • the value of monitoring, and basic techniques for monitoring.				
Action 5.2: Increase understanding of social impediments to feral pig control.	Medium priority. Years 1–5.	Feral pig management programs tailored to take account of social factors, including Indigenous social factors, while protecting threatened species/ ecological communities. Create opportunities for discussion and exchange of ideas and experience regarding feral pig control.	Guidance available to land managers undertaking control programs.	Researchers in association with TAFEs, universities, organisations delivering agricultural and natural resource management advice.

Objective 6: Improve public awareness about feral pigs and the environmental damage and problems they cause.

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 they cause. 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 effective feral pig control programs, to ensure there is lasting public support for management and research. This includes emphasising the limited effectiveness of uncoordinated recreational hunting on long-term, broad-scale feral pig control.

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.

Indigenous communities hold a range of values for feral pigs that are explored in some detail in the Background document.

Feral pigs can be highly mobile, taking advantage of changes in environmental conditions or changes in land management. The deliberate movement of feral pigs by people may also be a contributing factor to their dispersal and abundance. Members of the public should be encouraged to report new populations or significant changes in abundances of feral pigs to assist with control actions, and to come forth with evidence that may assist agencies take action against individuals who deliberately take feral pigs captive and release them elsewhere.

Action	Priority/ timeframe	Outcome	Output	Key Actioners
Action 6.1: Develop and deliver a public education program about feral pigs and the environmental damage and problems they cause. 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.	Low priority. Years 1–5.	Greater public awareness of the environmental damage feral pigs cause, and the problems feral pigs cause to both the environment and primary producers. Public support is forthcoming for funding feral pig control programs.	Media monitoring shows an increase in stories/articles or awareness of the feral pig problem. AND/OR Public surveys on the environment indicate an awareness of the feral pig problem.	Australian, state and territory biosecurity agencies. *Specific control programs should deliver education in local areas as appropriate.*

Action	Priority/ timeframe	Outcome	Output	Key Actioners
Action 6.2: Ensure deterrents are in place to discourage the translocation of feral pigs, and include this information in community education programs	Medium priority. Years 1–5	Greater public awareness of biosecurity regulations related to feral pigs. Public support is forthcoming to minimise the dispersal and abundance of feral pigs	Public surveys on the environment indicate an awareness of regulation related to feral pigs.	Relevant state and territory authorities.

3. Duration, cost and evaluation of the plan

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 life of this 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 this threat abatement plan will require ongoing management beyond the life of the threat abatement plan. Ongoing support by all partners is therefore essential.

3.1 Duration

This plan reflects the fact that the threat abatement process will be ongoing, as there is no possibility of nationally eradicating feral pigs in the life of this plan. The plan lays out measures that should be taken in the next five years to reduce the impact from the key threatening process of predation, habitat degradation, competition and disease transmission by feral pigs. Within the life of this threat abatement plan the focus is on suppressing and managing the impacts of feral pigs in targeted areas where they pose the greatest threat to biodiversity.

Threat abatement plans have a statutory review point at intervals of not longer than five years. Depending on the degree of implementation and the success of that implementation, some or many of the objectives and actions in this plan may be varied following this review.

3.2 Investment in the plan

Investment in many of the threat abatement plan actions will be determined by the level of resources that stakeholders commit to management of the problem. The Commonwealth is committed, via the EPBC Act, to implement the threat abatement plan to the extent to which it applies in Commonwealth areas. However, it should be noted that the Australian Government is unable to provide funding to cover all actions in this threat abatement plan across all of Australia and requires financial and implementation support from stakeholders. Partnerships amongst and between governments, non-government organisations, community groups and individuals will be key to successfully delivering significant reductions in the threats posed by feral pigs.

3.3 Costings

Outlined below are some estimates of costs of implementation of the actions within the plan. They have been obtained from multiple agencies and individuals actively engaged in feral pig control; in some instances more than one costing has been provided for an activity. Costings have been placed in this section instead of against each objective because it is difficult to fully cost the implementation of each action because of unknown variables. In particular, research or field project costs are going to be highly variable dependent on the subject and location. A more remote location, or one with difficult access, will cost more than an accessible site. Other actions are contingent on particular prior actions (e.g. identification of high priority sites) and cannot be accurately costed until the prior action is undertaken. What is presented here are estimates of different elements to actions within the plan to provide a guide to governments, researchers, land managers, island owners, community and others when considering what actions they may be able to implement.

Anyone looking to implement an action is strongly recommended to undertake their own budget exercise for their particular circumstances and the outcomes sought.

Action	Cost anticipated or known at time of TAP development for action times	Comments
Exclusion fencing	Fencing (total cost) $7,000–14,000 per kilometre. Components: Fencing materials $2,600 per kilometre Fencing labour $45 per hour	Can be double in hilly country
Trapping	Trap costs $650–800 each; comprising: Trapping materials for 1 trap $200–500 Labour – construction for 1 trap ranges from $25–$45 per hour for one day per trap. Maintenance labour with vehicle is $100,000 per year. An extra person adds $70,000 per year. Labour – checking traps $45 per hour, full day to check traps. Vehicle use $1.20 per kilometre and may average 150 km per day. Materials – bait (molasses/ apples/grain) $10 per kilogram. Also need to include ammunition/firearm costs plus training requirements for use of corporate firearms.	Depends on trap type – these estimates are provided for a weldmesh style figure 6 trap.
Aerial shooting	Helicopter $1100–1200 per hour of flight Labour $75 per hour of flight Ammunition $100–150 per hour of flight	
Poisoning with 1080 (meat or grain baits)	Grain + 1080 at 0.016 litres (16 mls) per kilogram, $250–300 per 100 kilograms Meat $1.80 per bait (2.4 mls injected 1080) Grain is $12/25kg, need to pre-feed for 1 month. Baiting programs can cost as little as $1,000–2,000 for the materials.	
Poisoning with sodium nitrite (estimated; not released for use yet)	Estimated $60 for quantity sufficient to kill up to 20 pigs	

Action	Cost anticipated or known at time of TAP development for action times	Comments
Research projects, including development of new control tools and models	$250,000 annually per researcher.	
Social research into barriers for pig control	$200,000 including community engagement.	Estimated $200,000 over whole of TAP (nationally; 5 years).
Prioritisation of pig control areas	$100,000 for initial regional reviews of areas per state/territory.	Estimated $800,000 plus additional funding for finer scale prioritisation over whole of TAP (nationally; 5 years).
Development of coordinated reporting mechanisms	$50,000 per state/territory.	Estimated $300,000 over whole of TAP (nationally; 5 years).
Development of management plans	$10,000 for each regional plan.	Estimated $200,000 for 20 regions.
Community education	$200,000 per state/territory for general promotion per year. This amount may decline as material can be reused and education levels rise.	Estimated $1.2 million per state/territory over 5 years.
Training	$10,000 to $100,000 to develop different materials and programs. $2,000 to $100,000 for delivery.	Estimated $250,000 over whole of TAP (nationally; 5 years). Estimated over $300,000 over whole of TAP (nationally; 5 years).

This threat abatement plan provides a framework for undertaking targeted priority actions. Budgetary and other constraints may affect the achievement of the objectives of this plan, and as knowledge changes, proposed actions may need to be modified over the life of the plan. Australian Government funds may be available to implement key national environmental priorities, such as relevant actions listed in this plan and actions identified in regional natural resource management plans.

3.3 Evaluating implementation of the plan

In many situations it may be difficult to assess directly the effectiveness of the plan in abating the impacts of feral pigs on Australia's biodiversity. However, performance indicators have been provided against each of the objectives to provide an indication of the level of threat abatement that has been achieved.

Measurements in the improvement of threatened species populations or conditions can be monitored, particularly where the primary threat is feral pig predation (e.g. percentage of marine turtle nests not preyed upon and hatching successfully). However, in many situations,

feral pig management is only an element of a complete recovery plan, so being able to accurately assess impact of feral pig control may be difficult. Individual feral pig control programs with comprehensive monitoring may be able to record recoveries in threatened species populations.

GLOSSARY

EPBC Act	The *Environment Protection and Biodiversity Conservation Act 1999,* the Australian Government's environment legislation.
Key threatening process	A threatening process listed under the EPBC Act that meets any of the following criteria: • 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.
Near-threatened species	A species currently not listed as threatened under the EPBC Act, but being impacted by threats in such a way that they could become eligible for listing as threatened in the near future. Note this is a purely descriptive term used for purposes of this document and is not a legal term or category used in the EPBC Act.

APPENDIX A: COMMONWEALTH LEGISLATION RELEVANT TO THREAT ABATEMENT PLANS

The following extracts from the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Environment Protection and Biodiversity Conservation Regulations 2000, which are relevant to the making of threat abatement plans, are provided for information only, and are not legal documents.

Content of threat abatement plans—*Environment Protection and Biodiversity Conservation Act 1999*

Section 271 Content of threat abatement plans

(1) A threat abatement plan must provide for the research, management and other actions necessary to reduce the key threatening process concerned to an acceptable level in order to maximise the chances of the long-term survival in nature of native species and ecological communities affected by the process.

(2) In particular, a threat abatement plan must:

(a) state the objectives to be achieved; and

(b) state criteria against which achievement of the objectives is to be measured; and

(c) specify the actions needed to achieve the objectives; and

(g) meet prescribed criteria (if any) and contain provisions of a prescribed kind (if any).

(3) In making a threat abatement plan, regard must be had to:

(a) the objects of this Act; and

(b) the most efficient and effective use of the resources that are allocated for the conservation of species and ecological communities; and

(c) minimising any significant adverse social and economic impacts consistently with the principles of ecologically sustainable development; and

(d) meeting Australia's obligations under international agreements between Australia and one or more countries relevant to the species or ecological community threatened by the key threatening process that is the subject of the plan; and

(e) the role and interests of Indigenous people in the conservation of Australia's biodiversity.

(4) A threat abatement plan may:

(a) state the estimated duration and cost of the threat abatement process; and

(b) identify organisations or persons who will be involved in evaluating the performance of the threat abatement plan; and

(c) specify any major ecological matters (other than the species or communities threatened by the key threatening process that is the subject of the plan) that will be affected by the plan's implementation.

(5) Subsection (4) does not limit the matters that a threat abatement plan may include.

Section 274 Scientific Committee to advise on plans

(1) The Minister must obtain and consider the advice of the Scientific Committee on:

(a) the content of recovery and threat abatement plans; and

(b) the times within which, and the order in which, such plans should be made.

(2) In giving advice about a recovery plan, the Scientific Committee must take into account the following matters:

(a) the degree of threat to the survival in nature of the species or ecological community in question;

(b) the potential for the species or community to recover;

(c) the genetic distinctiveness of the species or community;

(d) the importance of the species or community to the ecosystem;

(e) the value to humanity of the species or community;

(f) the efficient and effective use of the resources allocated to the conservation of species and ecological communities.

(3) In giving advice about a threat abatement plan, the Scientific Committee must take into account the following matters:

(a) the degree of threat that the key threatening process in question poses to the survival in nature of species and ecological communities;

(b) the potential of species and ecological communities so threatened to recover;

(c) the efficient and effective use of the resources allocated to the conservation of species and ecological communities.

Section 279 Variation of plans by the Minister

(1) The Minister may, at any time, review a recovery plan or threat abatement plan that has been made or adopted under this Subdivision and consider whether a variation of it is necessary.

(2) Each plan must be reviewed by the Minister at intervals of not longer than 5 years.

(3) If the Minister considers that a variation of a plan is necessary, the Minister may, subject to subsections (4), (5), (6) and (7), vary the plan.

(4) The Minister must not vary a plan, unless the plan, as so varied, continues to meet the requirements of section 270 or 271, as the case requires.

(5) Before varying a plan, the Minister must obtain and consider advice from the Scientific Committee on the content of the variation.

(6) If the Minister has made a plan jointly with, or adopted a plan that has been made by, a State or self-governing Territory, or an agency of a State or self-governing Territory, the Minister must seek the cooperation of that State or Territory, or that agency, with a view to varying the plan.

(7) Sections 275, 276 and 278 apply to the variation of a plan in the same way that those sections apply to the making of a recovery plan or threat abatement plan.

Content of threat abatement plans—Environment Protection and Biodiversity Conservation Regulations 2000

Part 7 Species and communities

Regulation 7.12. Content of threat abatement plans.

For paragraph 271 (2) (g) of the Act, a threat abatement plan must state:

(a) any of the following that may be adversely affected by the key threatening process concerned:

(i) listed threatened species or listed threatened ecological communities;

(ii) areas of habitat listed in the register of critical habitat kept under section 207A of the Act;

(iii) any other native species or ecological community that is likely to become threatened if the process continues; and

(b) in what areas the actions specified in the plan most need to be taken for threat abatement.

APPENDIX B: EPBC-LISTED SPECIES AND ECOLOGICAL COMMUNITIES IMPACTED BY FERAL PIGS

The following species and ecological communities are listed as threatened under the EPBC Act. They have been extracted from the Department of the Environment and Energy's Species Profile and Threats (SPRAT) database after being identified as threatened or potentially threatened by feral pigs. The SPRAT database is compiled using data from multiple sources, including state and territory conservation agencies, research organisations and individual researchers.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Amytornis barbatus barbatus (Grey Grasswren (Bulloo)	Endangered	Bird	Perceived	There are a number of factors which may contribute to habitat degradation including rooting (digging) by feral pigs.
Casuarius casuarius johnsonii (Southern Cassowary (Australian), Southern Cassowary)	Endangered	Bird	Known	Southern cassowary occurs along the eastern part of Cape York. Feral pigs degrade the bird's habitat by degrading water sources. Feral pigs probably compete with Southern Cassowaries for fallen fruit. Pig traps are also known to have resulted in the deaths of some cassowaries. Feral pigs wallowing and rooting around the edges of watercourses and swamps degrade habitat and affect water quality
Dasyornis brachypterus (Eastern Bristlebird)	Endangered	Bird	Known	Feral pigs damage habitat, particularly by uprooting Wild Sorghum.
Epthianura crocea macgregori (Yellow Chat (Dawson))	Critically Endangered	Bird	Perceived	Current habitat is being grazed by... feral pigs which may be causing long-term habitat degradation.

[2] The 'Grouping' field is not strictly taxonomic, and is designed to allow people to find plants and animals of interest under common names/labels rather than under taxonomic labels.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Epthianura crocea tunneyi (Yellow Chat (Alligator Rivers))	Endangered	Bird	Known	Immediate threat ... is habitat damage by feral pigs.
Erythrura gouldiae (Gouldian Finch)	Endangered	Bird	Known	In the Northern Territory, habitat degradation by feral pigs can destroy or reduce wet season foraging habitat for these birds.
Geophaps smithii blaauwi (Partridge Pigeon (western))	Vulnerable	Bird	Perceived	Potential threats include grazing and trampling of habitat by feral animals particularly cattle (*Bos taurus*), donkeys (*Equus asinus*) and feral pigs (*Sus scrofa*).
Leipoa ocellata (Malleefowl)	Vulnerable	Bird	–	Added on advice of Parks Victoria in October 2015.
Malurus coronatus coronatus (Purple-crowned Fairy-wren (western))	Endangered	Bird	Known	Identified threats include grazing and trampling of habitat by cattle and feral herbivores, notably water buffalo (*Bubalus bubalis*), donkeys (*Equus aqinus*) and feral pigs (*Sus scrofa*).
Neochmia phaeton evangelinae (Crimson Finch (white-bellied))	Vulnerable	Bird	Known	Grazing mammals such as feral pigs and cattle can degrade riparian habitats during the dry season when they congregate around sources of fresh water and destroy the rank grasses by feeding upon and trampling them.
Pedionomus torquatus Plains Wanderer	Critically Endangered	Bird	–	Added on advice from Parks Victoria in October 2015.
Psephotus chrysopterygius (Golden-shouldered Parrot)	Endangered	Bird	Perceived	A shortage of food occurs annually in the early wet season and this can be made worse by intense cattle and feral pig grazing. Pigs and cattle can also destroy the termite mounds that the parrots breed in.
Turnix melanogaster (Black-breasted Button-quail)	Vulnerable	Bird	Known	Affected by grazing and other disturbances caused by cattle, horses and feral pigs; being ground-nesters, they are also affected by predation by cats, foxes and pigs.
Euploea alcathoe enastri (Gove Crow Butterfly)	Endangered	Butterfly	Perceived	Feral animals, particularly water buffalo *Bubalus bubalis* and feral pigs *Sus scrofa*, are on the Gove Peninsula. Such animals are known to damage monsoon rainforest habitat, and may also damage the groundwater forest which is the habitat where the Gove Crow Butterfly occurs.
Paralucia spinifera (Bathurst Copper Butterfly, Purple Copper Butterfly, Bathurst Copper, Bathurst Copper Wing, Bathurst-Lithgow Copper, Purple Copper)	Vulnerable	Butterfly	Known	Feral pigs have been identified as a threat to Native Blackthorn (*Bursaria spinosa subsp. Lasiophylla*), a tall native shrub that this species only occurs in the presence of.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Engaeus martigener (Furneaux Burrowing Crayfish)	Endangered	Crayfish (Burrowing)	Perceived	Feral pigs have previously been identified as a potential risk to the species through the pigs' digging. While burrow depth would again appear to protect crayfish from the direct effects of such disturbance, this is an issue that needs to be addressed.
Engaewa reducta (Dunsborough Burrowing Crayfish)	Critically Endangered	Crayfish (Burrowing)	Perceived	Main potential threats include feral pigs.
Engaewa walpolea (Walpole Burrowing Crayfish)	Endangered	Crayfish (Burrowing)	–	Main potential threats to existing populations include feral pigs (*Sus scrofa*).
Engaewa pseudoreducta (Margaret River Burrowing Crayfish)	Critically Endangered	Crayfish (Burrowing)	Perceived	Feral pigs could damage habitat through ground-rooting feeding behaviour and prey on crayfish.
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Ecological Community	Known	
Temperate Highland Peat Swamps on Sandstone	Endangered	Ecological Community	Known	Main identified threats include damage from introduced animals such as feral pigs (*Sus scrofa*), foxes (*Vulpes vulpes*), dogs (*Canis familiaris*), cats (*Felis catus*), and rabbits (*Oryctolagus cuniculus*)
The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin	Endangered	Ecological Community	Known	
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Ecological Community	–	Threat of habitat degradation by feral pigs.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically endangered	Ecological Community		
Temperate highland peat swamps on sandstone	Endangered	Ecological Community		

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Ecological Community		
The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin	Endangered	Ecological Community		
Chlamydogobius squamigenus (Edgbaston Goby)	Vulnerable	Fish (Freshwater)	Known	
Chlamydogobius micropterus (Elizabeth Springs Goby)	Endangered	Fish (Freshwater)	Known	
Scaturiginichthys vermeilipinnis (Redfin Blue Eye, Redfin Blue-eye)	Endangered	Fish (Freshwater)	Known	
Geocrinia alba (White-bellied Frog, Creek Frog)	Endangered	Frog	Some Perceived, Some Known	Other threats to the white-bellied frogs include habitat destruction by (fire and) feral pigs.
Geocrinia vitellina (Orange-bellied Frog)	Vulnerable	Frog	Some Known, Some Perceived	Potential threats to *G. vitellina* include feral pigs.
Litoria dayi (Lace-eyed Tree Frog, Australian Lacelid)	Endangered	Frog	Perceived	Threatened by potential predation when on the ground (e.g. stream edges and adjacent forest); also habitat damage. This frog is a rainforest species, endemic to the Wet Tropics Bioregion (Williams & Hero 1998, 2001).
Litoria lorica (Armoured Mistfrog)	Critically Endangered	Frog	Perceived	Threatened by potential predation when on the ground (e.g. stream edges and adjacent forest); also habitat damage. The Armoured Mistfrog occurs on the Carbine Tablelands in north-east Queensland where a single population is restricted to 4 km of stream habitat with a total population size of 500-1000 (Hoskin & Puschendorf 2013).
Litoria nannotis (Waterfall Frog, Torrent Tree Frog)	Endangered	Frog	Perceived	Threatened by potential predation when on the ground (e.g. stream edges); also habitat damage. The Waterfall Frog occurs throughout the Wet Tropics Bioregion, North Queensland, from Paluma to Cooktown (Hero & Fickling 1994), but only has stable populations at lowland sites (180-400 m) (Hero et al. 1998, 2002; McDonald & Alford 1999).

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Litoria nyakalensis (Mountain Mistfrog)	Critically Endangered	Frog	Perceived	Feral pigs are a potential cause of riparian habitat damage and adult frog mortality. The Mountain Mistfrog formerly occurred across two thirds of the Wet Tropics Region from Douglas Creek near Cardwell to Alexandra Creek, Thornton Peak, north-east Queensland (Hero & Fickling 1994) at altitudes between 380 and 1020 m (McDonald 1992).
Litoria rheocola (Common Mistfrog)	Endangered	Frog	Perceived	Threatened by potential predation when on the ground (e.g. stream edges and adjacent forest); also habitat damage. The Common Mistfrog historically occurred from Broadwater Creek National Park to Amos Bay, northern Queensland, at altitudes between 0 and 1180 m above sea level (asl) (McDonald 1992).
Litoria olongburensis (Wallum Sedge Frog)	Vulnerable	Frog	Perceived	Other known and potential threats include habitat disturbance and predation by feral pigs. The Wallum Sedge Frog has been recorded in south-east Queensland and north-east NSW and on several other offshore sand islands, including Bribie, Moreton and North Stradbroke Islands.
Mixophyes fleayi (Fleay's Frog)	Endangered	Frog	Known	Large areas of this species' habitat have been and continue to be degraded by feral animals (e.g. feral pigs in the Conondale Range).
Mixophyes iteratus (Giant Barred Frog, Southern Barred Frog)	Endangered	Frog	Known	Threat of predation by feral pigs.
Pseudophryne corroboree (Southern Corroboree Frog)	Critically Endangered	Frog	Perceived	Threat of habitat degradation by feral pigs.
Pseudophryne pengilleyi (Northern Corroboree Frog)	Critically Endangered	Frog	Perceived	Excavation by feral pigs has also been identified as a potentially threatening process for the species.
Spicospina flammocaerulea (Sunset Frog)	Endangered	Frog	Perceived	
Taudactylus pleione (Kroombit Tinker Frog, Pleione's Torrent Frog)	Critically Endangered	Frog	Known	Soil disturbance by feral pigs is also likely to greatly increase the spread of riparian weeds such as mistflower and crofton weed. Feral pigs are also potential vectors of chytrid fungus. At Kroombit Tops, feral pigs have only recently arrived but they have caused significant damage to at least two sites known to support the Kroombit Tinker Frog. Although there may be direct predation by feral pigs, the greatest effect is likely to be the impact of habitat degradation.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Taudactylus rheophilus (Tinkling Frog)	Endangered	Frog	Perceived	
Liopholis guthega (Guthega Skink)	Endangered	Lizard	Potential	
Nangura spinosa (Nangur Spiny Skink)	Critically Endangered	Lizard		Key threats to the Nangur Spiny Skink include predation by feral animals, including feral pigs.
Pseudomys pilligaensis (Pilliga Mouse, Poolkoo) **Note:** some DNA evidence suggests this species may be an isolated population of the non-threatened delicate mouse (*Pseudomys delicatulus*); this may alter this species' listing in the future, or lead to its de-listing.	Vulnerable	Mammal (Placental)	Known	Threat of habitat degradation by feral pigs.
Xeromys myoides (Water Mouse, False Water Rat, Yirrkoo)	Vulnerable	Mammal (Placental)	Known	
Zyzomys maini (Arnhem Rock-rat, Arnhem Land Rock-rat, Kodjperr)	Vulnerable	Mammal (Placental)	Known	27% of rainforest patches were "severely disturbed" by feral pigs.
Zyzomys palatalis (Carpentarian Rock-rat, Aywalirroomoo)	Endangered	Mammal (Placental)	Known	
Bettongia penicillata ogilbyi (Woylie)	Endangered	Marsupial	Known	Dogs (*Canis familiaris*) and feral pigs (*Sus scrofa*) have also been implicated as the cause of several failed reintroduction attempts. Habitat destruction can also come about from feral pigs.
Bettongia tropica (Northern Bettong)	Endangered	Marsupial	Known	The major threat from invasive species to the northern bettong is competition for hypogeous (underground) fungi from feral pigs
Isoodon obesulus obesulus (Southern Brown Bandicoot (Eastern))	Endangered	Marsupial		Threat of habitat degradation by feral pigs.
Lasiorhinus krefftii (Northern Hairy-nosed Wombat, Yaminon)	Endangered	Marsupial	Perceived	

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Potorous longipes (Long-footed Potoroo)	Endangered	Marsupial	Perceived	Threat of competition with feral pigs.
Caladenia arenaria (Sand-hill Spider-orchid)	Endangered	Orchid	Perceived	There may ... be consumption of the tubers by various animals, such as feral pigs.
Caladenia atroclavia (Black-clubbed Spider-orchid)	Endangered	Orchid	Known	Main identified threat to *C. atroclavia* is feral pigs (*Sus scrofa*).
Caladenia dorrienii (Cossack Spider-orchid)	Endangered	Orchid	Perceived	Main potential threats to cossack spider-orchid include grazing and disturbance by kangaroos and feral pigs. Feral pigs have also caused significant disturbance in the past through diggings and trampling to the habitat at one population.
Caladenia elegans (Elegant Spider-orchid)	Endangered	Orchid	Some Known, Some Perceived	Feral pig activity has been observed in most populations. As well as grazing the orchids themselves, feral pigs can destroy the underground tubers of the orchid and also affect the growth of symbiotic fungi that are essential for germination and for providing starches for the plant (Hoffman and Brown, 1998).
Caladenia hoffmanii	Endangered	Orchid	Perceived	Main potential threats include feral pigs (*Sus scrofa*).
Caladenia tessellata (Thick-lipped Spider-orchid, Daddy Long-legs)	Vulnerable	Orchid	Potential	
Caladenia wanosa (Kalbarri Spider-orchid)	Vulnerable	Orchid	Known	Main identified threats include substrate disturbance by feral pigs (*Sus scrofa*).
Caladenia winfieldii (Majestic Spider-orchid)	Endangered	Orchid	Known	[Feral pigs are] ... affecting the growth of the symbiotic fungi essential for germination and starch provision to the plant. Two remaining populations are threatened by feral pigs.
Caladenia harringtoniae	Vulnerable	Orchid	Known	Other identified threats include grazing by feral pigs.
Diuris pedunculata (Small Snake Orchid, Two-leaved Golden Moths, Golden Moths, Cowslip Orchid, Snake Orchid)	Endangered	Orchid	–	Threat of grazing and/or habitat degradation by feral pigs.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Diuris venosa (Veined Doubletail, Goat Orchid, Veined Donkey-orchid)	Vulnerable	Orchid	Known	Threatened by damage by feral pigs.
Drakaea concolor (Kneeling Hammer-orchid)	Vulnerable	Orchid	Perceived	Main identified threats to kneeling hammer-orchid include grazing; evidence of feral pigs (*Sus scrofa*) grazing on the species at numerous populations.
Habenaria macraithii (an orchid)	Endangered	Orchid	Perceived	Main potential threats to the species are those that affect its habitat including feral pigs.
Microtis globula (South-Coast Mignonette Orchid)	Vulnerable	Orchid	Perceived	Main potential threat to South-Coast mignonette orchid is feral pigs (*Sus scrofa*) – habitat degradation and grazing.
Phaius australis (Lesser Swamp-orchid)	Endangered	Orchid	Known	Threat of grazing and/or habitat degradation by feral pig; feral pigs, although not thought to be feeding on the swamp orchids, root up the soil whilst searching for food and are especially damaging in Bundjalung National Park, north-east New South Wales.
Phaius bernaysii (Yellow Swamp-orchid)	Endangered	Orchid	Known	... feral pigs have adversely affected ... *Phaius australis* var. *bernaysii*.
Phaius pictus (an orchid)	Vulnerable	Orchid	Perceived	Feral pigs are a potential threat to this species.
Prasophyllum morganii (Mignonette Leek-orchid, Cobungra Leek-orchid, Dense Leek-orchid)	Vulnerable	Orchid	–	Threat of habitat degradation by feral pig.
Pterostylis cucullata (Leafy Greenhood)	Vulnerable	Orchid	–	Threat of habitat degradation by feral pigs.
Pterostylis saxicola (Sydney Plains Greenhood)	Endangered	Orchid	–	Threat of grazing by feral pigs.
Pterostylis sinuata (Northampton Midget Greenhood, Western Swan Greenhood)	Endangered	Orchid	Known	Feral pig activity has been observed in most populations.
Thelymitra dedmaniarum (Cinnamon Sun-orchid)	Endangered	Orchid	Known	As well as grazing the orchids themselves, pigs can destroy the underground tubers of the orchid and also affect the growth of symbiotic fungi that are essential for germination.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Vappodes lithocola (an orchid)	Endangered	Orchid	Perceived	Some populations may sustain damage from feral pigs (*Sus scrofa*).
Vrydagzynea grayi (Australian population) (an orchid)	Endangered	Orchid	Perceived	Feral pigs are a potential threat.
Zeuxine polygonoides (Velvet Jewel Orchid)	Vulnerable	Orchid	Perceived	Main potential threats include feral pigs.
Asplenium wildii (a fern)	Vulnerable	Plant	Perceived	Main potential threats include feral pigs.
Ballantinia antipoda (Southern Shepherd's Purse)	Endangered	Plant	Known	The feral pigs cause considerable damage to vegetation and soils, including Southern Shepherds Purse habitat.
Baloskion longipes (Dense Cord Rush)	Vulnerable	Plant	Known	Threat of habitat degradation by feral pig – feral pigs (*Sus scrofa*) rooting for food, directly damaging the species and surrounding habitat (CA, 2008).
Burmannia sp. Melville Island (R.Fensham 1021)	Endangered	Plant	Known	
Calotis glandulosa (Mauve Burr-daisy)	Vulnerable	Plant	Known	In the Kosciuszko area, threat of habitat degradation and population loss by feral pigs (CA, 2008).
Chingia australis (a fern)	Endangered	Plant	Known	
Crepidium lawleri (a small plant)	Endangered	Plant	Known	Suffering from disturbance and degradation by feral pigs.
Cynanchum elegans (White-flowered Wax Plant)	Endangered	Plant	Known	Grazing by cattle, goats, rabbits, feral pigs, horses, sheep and deer is affecting remnant patches, causing rapid deterioration of the *C. elegans* habitat.
Diplazium pallidum (a fern)	Endangered	Plant	Known	Main identified threats include feral pigs (*Sus scrofa*).
Diplazium cordifolium (a fern)	Vulnerable	Plant	Known	Damage by feral pigs (but not by direct predation).
Eleocharis obicis (a spike rush)	Vulnerable	Plant	Known	Main identified threats to *E. obicis* include grazing and habitat destruction by feral rabbits (*Oryctolagus cuniculus*) and feral pigs (*Sus scrofa*).

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Eriocaulon carsonii (Salt Pipewort, Button Grass)	Endangered	Plant	Known	Rooting by feral pigs could potentially be the major threat to the species.
Eryngium fontanum (Blue Devil)	Endangered	Plant	Known	
Gardenia psidioides (Hann Gardenia)	Vulnerable	Plant	Perceived	Main potential threats include damage from feral pigs (*Sus scrofa*).
Gentiana baeuerlenii (Baeuerlen's Gentian)	Endangered	Plant	Perceived	Main threats to survival are likely to be damage caused to the area by feral pigs.
Gentiana bredboensis (Bredbo Gentian)	Vulnerable	Plant	Known	Main identified threats include habitat destruction by feral pigs (CA, 2008).
Gentiana wissmannii (New England Gentian)	Vulnerable	Plant	Perceived	Presently disturbance of soil by feral pigs and resulting destruction of vegetation in the swamps and on their margins occurs periodically.
Hoya australis subsp. *oramicola* (a vine)	Vulnerable	Plant	Perceived	The subspecies' habitat, monsoon forests, are vulnerable to feral pigs.
Kennedia glabrata (Northcliffe Kennedia)	Vulnerable	Plant	Known	Main identified threats to Northcliffe kennedia include disturbance from feral pigs.
Lawrencia buchananensis (a plant)	Vulnerable	Plant	Known	Below-ground parts heavily browsed by feral pigs.
Lepidium aschersonii (Spiny Pepper-cress)	Vulnerable	Plant	Known	
Lepidium monoplocoides (Winged Pepper-cress)	Endangered	Plant	–	Threat of habitat degradation by feral pigs.
Mitrella tiwiensis (a vine)	Vulnerable	Plant	Perceived	The subspecies' habitat, monsoon forests, are vulnerable to disturbance from feral pigs
Myriophyllum coronatum (an aquatic plant)	Vulnerable	Plant (Aquatic)	Perceived	Main potential threats include settlement pressures such as feral animals, especially feral pigs (*Sus scrofa*).
Plectranthus torrenticola (a plant)	Endangered	Plant	Perceived	Other possible threatening processes in the future include habitat degradation caused by feral pigs.
Plesioneuron tuberculatum (a plant)	Endangered	Plant	Perceived	Main potential threat to *P. tuberculatum* is feral pigs (*Sus scrofa*).
Reedia spathacea (Reedia)	Critically Endangered	Plant	Known	Main identified threats include predation by feral pigs; feral pigs pose the major threat to the species.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Rutidosis leiolepis (Monaro Golden Daisy)	Vulnerable	Plant	Perceived	Potential threats within Kosciuszko NP include feral pig activity
Swainsona murrayana (Slender Darling-pea, Slender Swainson, Murray Swainson-pea)	Vulnerable	Plant	Perceived	Other threats include disturbance by feral pigs.
Trachymene scapigera (Mountain Trachymene)	Endangered	Plant	Perceived	Main potential threats to the species include disturbance by feral pigs (*Sus scrofa*).
Typhonium jonesii (a herb)	Endangered	Plant	Perceived	Feral pigs are present on Bathurst Island and have recently been introduced to Melville Island. Feral pigs may potentially dig up the tuber of this species.
Typhonium mirabile (a herb)	Endangered	Plant	Perceived	Feral pigs may potentially dig up the tuber and cause a decline in numbers.
Verticordia fimbrilepis subsp. *fimbrilepis* (Shy Featherflower)	Endangered	Plant	–	
Acacia ammophila (a shrub)	Vulnerable	Shrub	Known	... in the Lake Bindegolly area ... feral pigs threaten the populations by the uprooting of seedlings.
Acacia phasmoides (Phantom Wattle)	Vulnerable	Shrub	Perceived	
Almaleea cambagei (Torrington Pea)	Vulnerable	Shrub	Known	Main identified threats to *Almaleea cambagei* include disturbance of habitat by feral pigs (*Sus scrofa*) and goats (*Capra hircus*).
Astrotricha roddii (a shrub)	Endangered	Shrub	Known	Main identified threats include grazing and habitat disturbance by feral goats (*Capra hircus*) and feral pigs (*Sus scrofa*)
Beyeria lepidopetala (Small-petalled Beyeria, Short-petalled Beyeria)	Endangered	Shrub	Known	
Boronia deanei (Deane's Boronia)	Vulnerable	Shrub	Known	Threat of habitat degradation by feral pig. Main identified threats to Deane's boronia include feral pigs (*Sus scrofa*) which cause direct damage to the species and to its swamp and stream bank habitat.
Callistemon forresterae (Forrester's Bottlebrush)	Vulnerable	Shrub	Potential	
Denhamia parvifolia (Small-leaved Denhamia)	Vulnerable	Shrub	Perceived	Lantana invasion, assisted by fire, feral pig and cattle damage can increase the frequency of hot fires which, in turn, leads to a further increase in density of Lantana.
Grevillea molyneuxii (a shrub)	Endangered	Shrub	Known	Main potential threats to *G. molyneuxii* include digging by animals such as feral pigs (*Sus scrofa*) in the shallow moss and peaty soil of the heathland community.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Homoranthus prolixus (a shrub)	Vulnerable	Shrub	Known	Habitat degradation by feral pig is identified main threat (CA, 2008).
Hypocalymma longifolium (Long-leaved Myrtle)	Vulnerable	Shrub	Known	Main identified threats include digging and trampling from feral pigs (*Sus scrofa*).
Lechenaultia chlorantha (Kalbarri Leschenaultia)	Vulnerable	Shrub	Known	Main identified threats to Kalbarri leschenaultia include grazing and habitat disturbance by feral pigs (*Sus scrofa*), feral rabbits (*Oryctolagus cuniculus*) and feral goats (*Capra hircus*).
Leucopogon confertus (Torrington Beard-heath)	Endangered	Shrub	Perceived	Possible threatening processes include grazing/digging by feral pigs.
Pimelea curviflora var. *curviflora* (a shrub)	Vulnerable	Shrub	Known	Main identified threats to *Pimelea curviflora* var. *curviflora* include grazing by pest fauna including feral pigs.
Pultenaea parrisiae (Bantam Bush-pea, Parris' Bush-pea)	Vulnerable	Shrub	Known	Main identified threats include damage by feral pigs (*Sus scrofa*).
Solanum dunalianum (a shrub)	Vulnerable	Shrub	Known	Main identified threats include exotic animals, such as feral pigs.
Stachystemon nematophorus (Three-flowered Stachystemon)	Vulnerable	Shrub	Known	Main identified threats include trampling by feral pigs (*Sus scrofa*).
Styphelia perileuca (a shrub)	Vulnerable	Shrub	Perceived	Main potential threats include disturbance by feral pigs (*Sus scrofa*).
Tasmannia glaucifolia (Fragrant Pepperbush)	Vulnerable	Shrub	Known	Main identified threats include grazing and trampling by pigs (*Sus scrofa*).
Tetratheca juncea (Black-eyed Susan)	Vulnerable	Shrub	Known	Threat of grazing by feral pigs.
Xerothamnella parvifolia (a shrub)	Vulnerable	Shrub	Known	Main identified threats include grazing by feral pigs, (*Sus scrofa*).
Xylopia monosperma (a shrub)	Endangered	Shrub	Potential	Main identified threats include feral pigs (*Sus scrofa*).
Gudeoconcha sophiae magnifica (a helicarionid land snail)	Critically Endangered	Snail	Potential	

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Mathewsoconcha grayi (Gray's Helicarionid Land Snail)	Critically Endangered	Snail	Potential	
Mathewsoconcha phillipii (Phillip Island Helicarionid Land Snail)	Critically Endangered	Snail	Potential	
Mystivagor mastersi (Masters' Charopid Land Snail)	Critically Endangered	Snail	Potential	
Pseudocharopa whiteleggei (Whitelegge's Land Snail)	Critically Endangered	Snail	Potential	
Pseudocharopa lidgbirdi (Mount Lidgbird Charopid Land Snail)	Critically Endangered	Snail	Potential	
Quintalia stoddartii (Stoddart's Helicarionid Land Snail)	Critically Endangered	Snail	Potential	
Archontophoenix myolensis (Myola Palm, Myola Archontophoenix)	Endangered	Tree	Perceived	Potential threats identified are feral pigs.
Cadellia pentastylis (Ooline)	Vulnerable	Tree	Known	Main identified threats include grazing and soil compaction by feral pigs.
Gulubia costata (a palm)	Vulnerable	Tree	Perceived	Feral pigs could cause habitat disturbance
Pouteria eerwah (Shiny-leaved Condoo, Black Plum, Wild Apple)	Endangered	Tree	Known	Main identified threats include seed predation by insects and feral pigs.
Sankowskya stipularis (a small tree)	Endangered	Tree	Perceived	Main potential threats to *S. stipularis* include feral pigs (*Sus scrofa*).
Caretta caretta (Loggerhead Turtle)	Endangered	Turtle (Marine)	Known	The main threats are identified as: predation of turtle eggs by native and introduced animals [including feral pigs].
Chelonia mydas (Green Turtle)	Vulnerable	Turtle (Marine)	Known	Threat of predation [eggs and hatchlings] by feral pigs.
Dermochelys coriacea (Leatherback Turtle, Leathery Turtle, Luth)	Endangered	Turtle (Marine)	Potential	Threat of predation [eggs and hatchlings] by feral pigs.

Species or Community Name	EPBC Status	Grouping[2]	Confidence	Comments (may be regionally focussed)
Eretmochelys imbricata (Hawksbill Turtle)	Vulnerable	Turtle (Marine)	Known	Egg predation. Predation of nests by feral pigs occurs in Qld.
Natator depressus (Flatback Turtle)	Vulnerable	Turtle (Marine)	Known	Egg predation. Feral pigs destroy up to 90% of the nests on western Cape York.
Elusor lavarackorum (Gulf Snapping Turtle)	Endangered	Turtle (Freshwater)	Known	Main identified threats to the Gulf Snapping Turtle include disturbance to nesting sites by feral animals, such as feral pigs (*Sus scrofa*).
Rheodytes leukops (Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver)	Vulnerable	Turtle (Freshwater)	Perceived	Turtles may be vulnerable to predation by pigs, foxes and dogs if forced to move over land due to artificial barriers communal nesting sites along river banks are now heavily exploited by foxes (*Vulpes vulpes*), feral pigs (*Sus scrofa*), dingos (*Canis lupus*).
Pseudemydura umbrina (Western Swamp Turtle)	Critically Endangered	Turtle (Freshwater)	Known	