Government of South Australia

South Australian Arid Lands Natural Resources Management Board

CARING FOR OUR COUNTRY

June 2013

South Australian Arid Lands Natural Resources Management Board

South Australia Lake Eyre Basin

Feral pig management plan

South Australia Lake Eyre Basin Feral Pig Management Plan

Desert Channels Queensland[1]

June 2013

A report to the SA Arid Lands Natural Resources Management Board

desert
channels
QUEENSLAND

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PART A – BACKGROUND TO THE PLAN AND ECOLOGY OF FERAL PIGS

Introduction to the plan and how to use it

Following consultation with land managers along the Diamantina Warburton and Cooper Creek systems, indications are that feral pig numbers are reasonably low at the date of writing this plan (June 2013) in this region.

It is however, a fact that over a number of wet seasons, it can trigger feral pigs to reproduce very quickly, undermining previous control programs.

Given the low numbers of feral pigs in South Australian, landholders are in a good position to put a plan in place to keep feral pig numbers from escalating to a point that causes wide spread damage. This is important given the spread of feral pigs in other parts of Australia.

Photo: Desert Channels Queensland

This plan has been broken into three parts as shown in Table 1.

Table 1 Components of the plan and how they can be used

Part	What the part covers	Who should use it
A – Background to the Feral Pig Plan and Ecology of Feral Pigs	The background to the plan, including benefits, legislation and plans affecting feral pig control. Provides details on the impacts of feral pig control and options to control it. Provides a history of current control programs within South Australia.	All interested parties in understanding the current situation of feral pig control in South Australia.
B – Strategies to control Feral Pigs in South Australia's Lake Eyre Basin	This part provides overarching strategies and actions that should be taken to manage feral pigs in the Lake Eyre Basin of South Australia.	To be used by community group members, regional planners and government officials in determining strategies and actions to control feral pigs.
C – Specific Property Plans	This part provides detailed property action plans within South Australia's Lake Eyre Basin. Provides actions each property can take to manage feral pigs.	To be used by property managers and working group members in developing actions to control feral pigs.

Benefits of the plan

Through committing to and implementing this plan, the following benefits can be expected to the landholder and the broader South Australian Lake Eyre Basin Community:

- Lower numbers of feral pigs, reducing damage to the property and risk of infection
- Meeting legislative requirements
- Implementing control that is best practice, and cheapest when done strategically
- Improves the natural values of the area
- Fosters good working relationships with other landholders
- Reduces the risk of spread for exotic diseases should they eventuate.

Links to other plans

Controlling feral pigs links to the 'South Australian Arid Lands Biodiversity Strategy' through the following:

- Priority Action 3 – reducing the impact of invasive species on biodiversity. Within this action in particular, is a desired outcome that 'broad-scale control methods of introduced fauna populations enhanced' and 'regional capacity to prevent, detect, manage and eradicate new species introductions is enhanced'.

It also links to the '**Regional Natural Resources Management Plan for the SA Arid Lands Natural Resources Management Region – Ten Year Strategic Plan**'. In particular this plan contributes to:

- Management Action Target 8- Ensure programs are in place aimed at achieving reductions in the distribution and numbers of identified priority pests by 2014; and
- Management Action Target 11 – Ensure all relevant land managers are engaged and supported in pest controls by 2014.

Finally, this plan also links to the Commonwealth's '**Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs'**.

Legislation relating to feral pigs in South Australia

Controlling feral pigs within South Australia is subject to the following legislation:

Natural Resources Management Act 2004 (South Australia)

- This legislation requires that a person must act reasonably in relation to the management of natural resources within South Australia. **Feral pigs are declared under this act and it is an offence to release feral pigs**. In addition, if anyone wants to keep pigs they need to comply with instructions from the Natural Resource Management authority.

Pastoral Land Management and Conservation Act, 1989 (South Australia)

- This legislation provides for the management and conservation of pastoral land (land comprised in a pastoral lease granted over Crown land for pastoral purposes). A condition of the granting of a pastoral lease is that the lessee must **'use reasonable means to keep the land free from vertebrate pests to the satisfaction of the Minister or the Pastoral Board'**. Domestic pigs cannot be kept without approval of the Pastoral Board.

Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

- '**Predation, habitat degradation, competition and disease transmission by feral pigs'** is listed as a key threatening process under the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999 (*EPBC Act). The invasive species provisions provide for the listing of the impacts of species as 'threatening processes' and if listed as such there is an obligation on the Commonwealth Government to prepare a Threat Abatement Plan to address the threats.
- Under the EPBC Act, the Australian Government has developed the Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs. A copy of the plan is available here. **http://www.environment.gov.au/biodiversity/threatened/publications/tap/pubs/feral-pig-tap.pdf**

Where the plan covers

Properties covered by the plan

The plan covers properties over two catchment systems as shown in Figure 1.

The first is over the Cooper System and includes the following properties:

- Cordillo Downs Pastoral Station
- Innamincka Regional Reserve
- Gidgealpa

The second is over the Diamantina/Warburton system and includes the following properties:

- Alton Downs
- Pandie Pandie
- Kalmurina
- Cowarie
- Clifton Hills

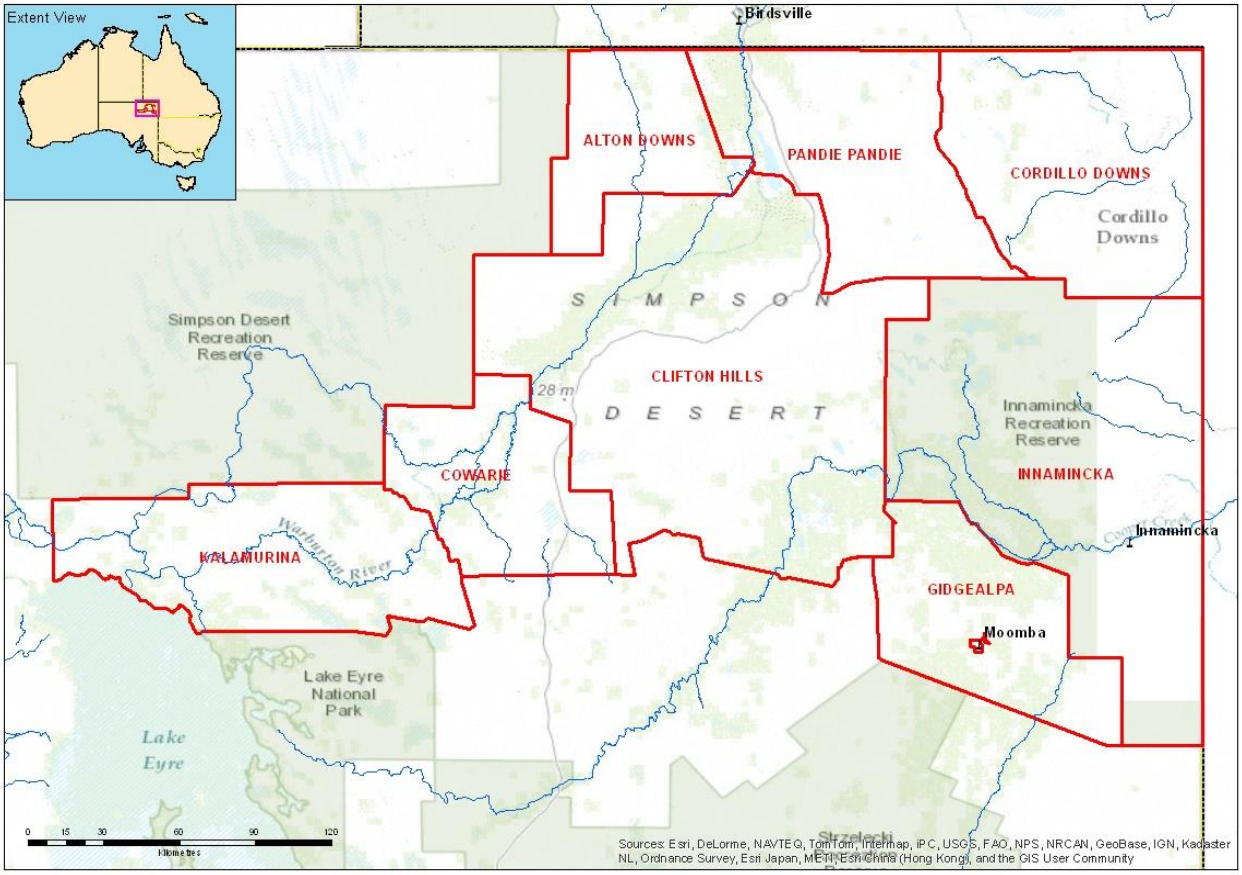

Figure 1 The area and properties subject to the plan.

Landscape values of the area

The Lake Eyre Basin covers about 1.2 million square kilometres, almost one-sixth of Australia, and is among the world's largest internally draining river systems. Lake Eyre itself is the fifth largest terminal lake in the world. The Basin includes large parts of South Australia, the Northern Territory, Queensland and some of western New South Wales. About 57,000 people live and work in the Basin. The Basin supports a range of nationally important natural, social and economic values.

Photo: Desert Channels Queensland

The Lake Eyre Basin is considered one of the world's last unregulated wild river systems. The vegetation of the Basin reflects the patterns of arid and semi-arid regions that rely on variable water flows. As a consequence the Basin is an area of high conservation significance that supports wetlands such as the

Ramsar listed Coongie lakes, grasslands (Astrebla Downs National Park) and deserts (such as the Simpson Desert National Park).

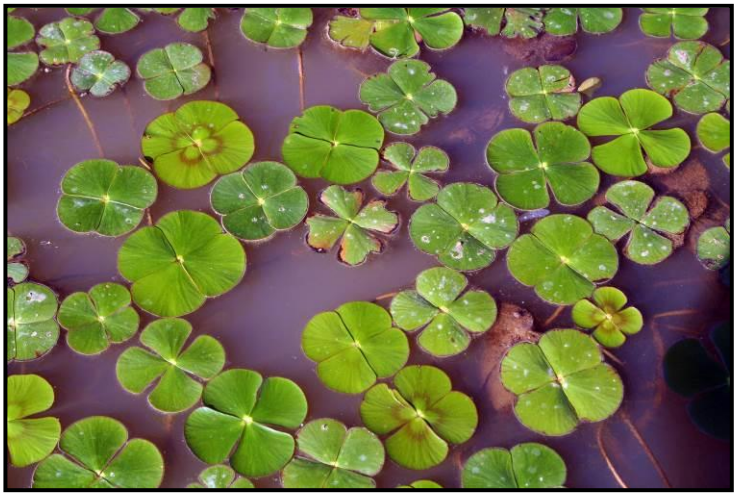

Photo: Desert Channels Queensland

In addition, since 1860 the area has been an important grazing area supporting a number of large properties and is an important part of the South Australian economy.

The Basin is also home to many rare and endangered species of plants and animals such as the Greater Bilby, the Kowari and Waddi Waddi trees (Acacia peuce). Mound springs, wetland areas of natural water seepage from the Great Artesian Basin also support a number of rare and highly restricted endemic species.

Within South Australia, the Lake Eyre Basin is well known for its range of values. In particular the following are some of the well-known attributes:

- the uniqueness of the mound springs within the area;
- the highly variable lakes within the area, which create a wide array of different habitats and support a rich and abundant aquatic fauna, such as waterbirds;
- the Coongie Lakes are unique at the global scale; and
- the Cooper and Warburton Creek drainages and the Goyder Lagoon are well known as important conservation areas.

These values reflect the need to manage this area to take into account the effects that feral pigs can have, both on conversation values, but also on the production values of the area.

Photo: Desert Channels Queensland

Feral Pig Ecology, Impacts and Control options

Information of feral pig ecology, impacts and control options have been sourced from the following documents:

- Choquenot, D., McIlroy, J. and Korn, T. (1996) *Managing Vertebrate Pests: Feral Pigs. Bureau of Resource Sciences*, Commonwealth Government.
- Department of Primary Industries and Fisheries. (2008) *Feral pig control – a practical guide to pig control in Queensland,* Queensland Government.
- Department of Environment and Heritage. (2005) *Threat Abatement Plan for Predation, habitat degradation, competition and disease transmission by feral pigs*, Commonwealth Government.

Ecology of Feral Pigs

Number of feral pigs across Australia

- Approximately 3.5 million to 23.5 million feral pigs in Australia
- Across 38% of the mainland with the potential to spread further
- The distribution of feral pigs is shown in Figure 2 below, which highlights the strategic location of feral pigs in the Lake Eyre Basin section of South Australia.

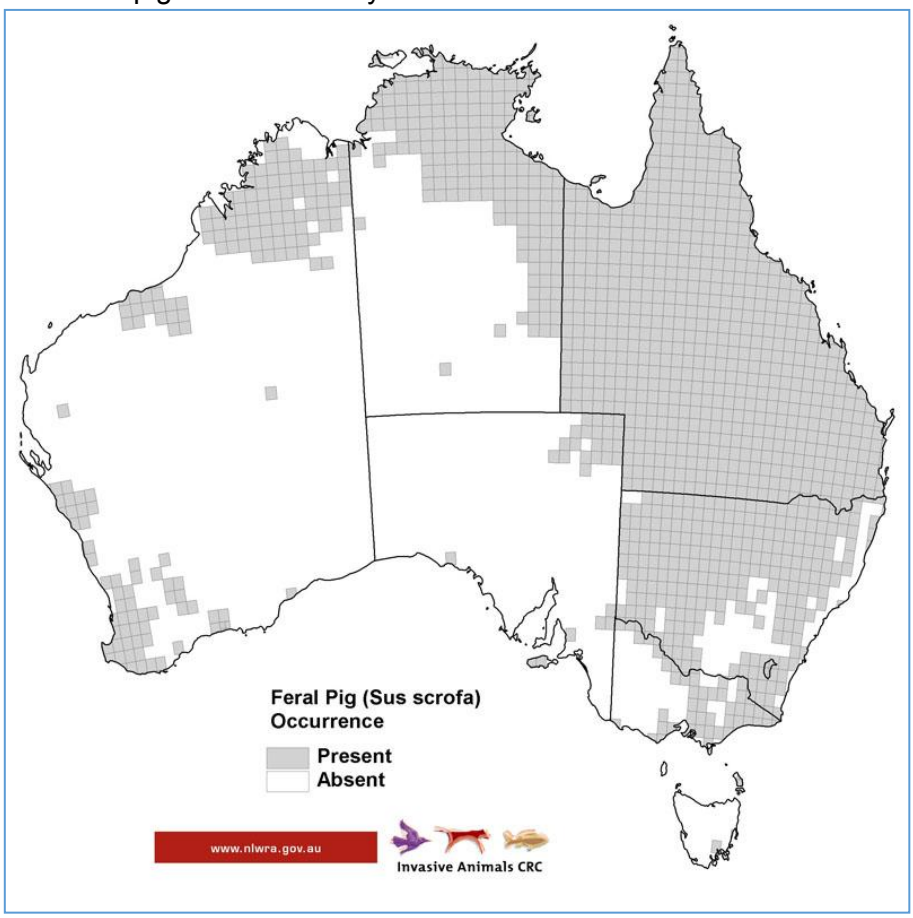

Figure 2 Distribution of feral pigs in Australia. Sourced from Feral.org.au **http://www.feral.org.au/feral-pig-national-maps-200607/**

Habitat

- The main habitat requirements are for food, cover and a reliable water supply
- Relatively intolerant of heat, with water being the most limiting resources
- Feral pigs prefer dense cover to avoid direct sunlight and high temperatures
- Because pigs have few sweat glands they tend to drink more often, and wallow in water or mud to cool off in high temperatures.
- Feral pigs have a defined home range and habitually make use of trails, shelter areas, feeding and watering areas, rubbing and tusking trees, and wallows. Home ranges of groups and individual boars overlap considerably.

Photo: Vanessa Macdonald - NSW DPI

- There is no evidence that feral pigs, of either gender, actively defend territories.
- The size of a feral pig's home range depends on a number of variables, including gender (males tend to have larger home ranges than females), resources and seasons
- Food availability and quality, and availability of water are thought to be the main determining factors influencing home range size.
- Home range size varies from as little as 0.16 km² for furrowing sows, to greater than 40 km² for individual boars in the semi-arid rangelands.
- Feral pigs are most active at dawn and dusk or during times of cooler temperatures (at night, during rainy or overcast conditions).
- They may also become less active during periods of disturbance from hunting or other human activities such as stock mustering.

Reproduction

- In good conditions, populations may increase by 500% in a 12–15 month period as breeding can occur all year round.
- Piglets normally spend the first 1−5 days of life inside a grass nest, with the sow inside or close by.
- Weaning occurs after 2–3 months.
- Sexual maturity in sows is dependent on weight (25–30 kg) rather than age, similar to domestic pigs.
- Feral pigs usually live less than five years in the wild. If they do live longer, it is often males that live the longest.
- Adult females have a 21-day oestrus cycle, with a gestation period of about 113 days (3 months, 3 weeks and 3 days).

Photo: Jason Wishart - NSW DPI

- Average litter size ranges between 4.9 and 6.3 piglets, but may be as high as 10 under favourable conditions.
- The time between birth of a litter and the next fertile mating is about 2–3 months. Sows can produce 2 litters per year in good conditions.

Diet

- Pigs are omnivorous, opportunistic feeders and can thrive in a variety of habitats and on a variety of diets. Feral pigs have a higher reproductive potential than other large mammals in Australia.
- The diet varies from region to region and the potential food sources are limited by availability rather than preference for any one food type.
- Mortality of juvenile pigs is very high if dietary protein intake is low. There may be a 90–100% mortality of young pigs (on low-protein diets) in dry seasons.
- Pigs have a high energy requirement, particularly during lactation and for the growth of young pigs. Sows require about 15% of their diet to be crude protein in order to successfully suckle their young. This protein requirement can be obtained from plant material, but is more commonly acquired from animal matter such as earthworms, carrion, arthropods, frogs and reptiles (although animal matter rarely exceeds 5–18% of a pig's diet).
- Feral pigs will relocate in response to low food availability, when protein and energy requirements associated with reproduction and growth are not being met.

Social structure

- The social structure of feral pigs is based on a matriarchal society with the most common group (called a sounder) consisting of related sows (mother, daughters, sisters, aunt's etc.) and their young.
- Bachelor groups (usually siblings) form when sexually mature males leave or are chased from the group.
- Older males operate alone or in pairs (siblings) and join the female groups for mating purposes.
- Group size varies with age, gender, food and water availability, and disturbances (such as hunting or other control measures).
- Group size can range from solitary boars to groups of 100 or more sharing a scarce resource such as a single waterhole during droughts.

Photo: Desert Channels Queensland

How do feral pigs affect grazing systems

Direct costs

- There are no clear figures on the direct cost of feral pigs in South Australia. However, in NSW and Queensland alone, feral pigs cause approximately $100 million in agricultural damage.
- Damage crops, fences and water infrastructure
- Damage pastures by grazing and rooting
- Prey on lambs
- Foul watering points

Potential outbreak of disease

- Feral pigs can carry many infectious diseases and internal and external parasites. Some are native to Australia, while others are exotic.
- Many of the diseases can not only spread to domestic pigs but to other livestock and humans.
- Some of the more serious diseases include the following:
    - **Brucellosis** is a bacterial disease causing severe long-term illness, undulating fever and possible infertility. Both strains are contracted by handling raw meat.
    - **Sparganosis** is a parasite that can infest the muscles of humans, forming cysts. It is common in pigs from swampy areas and is contracted by ingesting raw meat.
    - **Melioidosis** is a serious bacterial disease that causes abscesses and, in some cases, death. It can be contracted by handling infected animals.
    - **Leptospirosis** is a serious bacterial disease. In humans it is called Weil's disease— causing very high temperatures, kidney trouble and jaundice—and it can be fatal. It is found in up to 20% of feral pigs in Queensland.
    - **Q fever** is a disease that occurs in all animals and is well known to abattoir workers. It can cause a very high temperature resulting in heart problems, and can be fatal.

How do feral pigs affect the environment

Plants and animals

- Feral pigs consume bird chicks, reptiles, reptile and bird eggs, frogs, mussels, soil organisms, earthworms and other invertebrates, carrion, underground fungi, fruit, seeds, roots, tubers, bulbs and plant foliage.
- They can cause changes to ecosystems through destruction of plants, alteration of soil structure, increased invasion and spread of weeds, reduced amount and quality of water and creation of habitat suitable for disease vectors.

Aquatic ecosystems

- Pig activity has a dramatic effect on creeks and lakes through rooting, wallowing, trampling, tusking or rubbing trees. In many areas concentrated rooting disturbs the area around the waterline. Such disturbance of the natural vegetation affects not only water quality but the habitat of small aquatic and terrestrial animals. It also creates erosion and allows the establishment of exotic weeds.

Photo: Christopher Hume - NSW DPI

Control Options

Effective control requires an integrated, collaborative approach where all stakeholders participate in planning and implementation. Current feasible control methods include:

1. Shooting (ground and aerial)
2. Poisoning
3. Trapping

Biological control has also been identified as a potential control, but as discussed below this is not practical because of the domestic pig market.

Shooting (ground and aerial)

- Shooting pigs by helicopter is most effective where pigs exist in reasonable numbers and are observable from the air. It is usually too costly for low-density populations.
- In the dry tropics of Queensland (Townsville district), aerial shooting has been shown to be the most cost effective method of control.
- Ground shooting can be undertaken to reduce pig population but is more effective when undertaken on a small, isolated and accessible populations of pigs.

Photo: Desert Channels Queensland

Advantages

Aerial Shooting

- *Cost effective for pigs in reasonable numbers*
- *Aerial shooting allows for wide areas to be covered and is best suited to areas where pigs are living and feeding in extensive or inaccessible areas and where vehicle access is impractical*
- *Can be timed when pigs are concentrated in dry times, such as around waterholes*
- *Landholder is provided feedback on number of kills and populations missed*

Ground Shooting

- *Can implement quickly and all property workers can carry it out*
- *Inexpensive*
- *Effective when concentrated around waterholes*
- *Night vision scopes can be effective in open terrain because the pigs are unaware of where the firing originates, allowing more pigs to be controlled.*

Disadvantages

Aerial Shooting

- *Expensive for small populations*
- *Need the availability of helicopter, shooter and appropriate firearms*
- *Need to ensure areas are safe for shooting (outside tourist season)*
- *Reduces effectiveness in areas of heavy cover*
- *Becomes costly for low numbers spread over large distances*

Ground Shooting

- *Cannot access all areas easily*
- *Difficulty in knowing how many pigs are missed*
- *Needs to be carried out away from popular sites, such as tourist or public sites.*
- *Labour intensive and can cause pigs to disperse.*

Poisoning

- Poisoning is usually the most efficient and effective control method for reducing a pig population.
- Poison baits may only be distributed form the ground north of the dog fence in South Australia.
- Sodium fluoroacetate (1080) is the only registered poison for feral pigs in South Australia at the moment and require approval through authorised persons in the regional NRM board.
- Pre-feeding is the most important step in ground-poisoning operations. To maximise effectiveness, free feeding with non-poisoned bait should be performed for several days prior to laying poisoned baits.
- Pig-specific feeding stations (e.g. Hoghopper) may be of use to reduce non-target species access to bait, where required.
- In drier grazing areas, fresh meat baits are preferred due to meat being economical, easily obtained and readily accepted by feral pigs. Meat may be obtained from domestic cattle, sheep, goats or horses; offal from abattoirs; or kangaroo meat from pet abattoirs.
- Commercially produced pig baits are also now available for use in baiting operations. See animal control technologies **http://www.animalcontrol.com.au/pig-baits2.htm** for further information on manufactured baits. These baits require approval through authorised person in the regional NRM board.
- Using poison baits however may affect the organic status of some properties, reducing collaboration potential.

Photo: Andrew Bengsen – NSW DPI

Advantages

- *Could use commercial produced pig baits – easy to use*
- *Effective method that is efficient especially when lack of other feed is present*
- *Could target specific areas through on ground poisoning using feeding stations such as the hog hopper*

Disadvantages

- *Timely, requiring pre feeding to allow for confident control*
- *Require access to poison through government officials*
- *Requires access to pre-feeding stocks (grains) or meat baits*
- *Properties with organics status will not participate*

Trapping

- Trapping is an important technique that is most useful in populated areas, on smaller properties (less than 5000ha), and where there are low pig numbers. Trapping can be particularly useful in ´mopping up´ survivors from poisoning programs. It is most successful when food resources are limited.
- Special pig trap design can be made pig-specific and therefore pose little danger to other wild or domestic animals.
- The key elements of a successful trapping campaign are appropriate trap design, suitable placement, maintenance of the door mechanism and regular inspection of the trap when set.
- The success of trapping has been found to vary depending on the experience of the trap operator, local food abundance and the pig population size and distribution.
- Trapping is relatively expensive and labour-intensive, and is therefore not practical for large-scale control.

Advantages

- *It is the safest form of control and can be safely undertaken on closely populated areas.*
- *It is flexible and can be incorporated into routine property activities, as it makes economical use of labour and materials.*
- *Carcasses can be safely disposed of or used for provision of meat.*
- *Traps can be moved and re-used. Good trapping makes use of opportunities as they arise.*
- *It does not alter normal pig behaviour so it enables a greater number of the total population of an area to be removed.*
- *It is more humane to pigs and non-target species.*

- *Provides records of feral pig populations and numbers removed.*

Disadvantages

- *It can be time consuming, and expensive to purchase/construct traps and maintain.*
- *Requires access to feed to encourage pigs (grain).*
- *It must be checked regularly affecting day to day property management. This is particularly difficult for large properties*
- *Some pigs are trap shy.*

Biological Control

- Pathogens and immunocontraception have been suggested as possible biological control methods for feral pigs.
- These methods have not been pursued, as it would be difficult, if not impossible, to stop the spread of any disease to domestic pigs.

Advantages

- *Would be an efficient way to control pigs*

Disadvantages

- *Not possible because of the risk to the domestic pig industry*

Cost benefits of control

- It is important to note that no one method or combination of methods will be suitable for all situations.
- Each pig problem needs to be considered individually, with the most appropriate method or combination of methods selected based on the circumstances.
- An effective management program involves reducing the density of feral pigs to a level where the benefits are maximised compared to the cost involved.
- Wherever practical, management should concentrate on achieving clearly defined conservation or agricultural production benefits.

Key Points

- *Need to clearly weigh up the costs involved, versus the benefits gained through pest management to help decide management approaches*

Photo: Desert Channels Queensland

Resources to assist in understanding more about feral pig control

Websites and Guides

Type of Website or Guide	Description
National Website (Feral.org.au).	Contains information on vertebrate pest animal species in Australia and New Zealand. **http://www.feral.org.au/**
Managing Vertebrate Pests – Feral Pigs (Bureau of Resource Sciences)	Detailed report on methods to control feral pigs, resources required and cost benefits of certain control options. **http://www.feral.org.au/wp-content/uploads/2010/03/Managing-vertebrate-pests-feral-pigs.pdf**
How to conduct aerial shooting.	Guide to the requirements needed when conducting an aerial shoot. **http://www.feral.org.au/wp-content/uploads/2012/12/PIG002_aerial-shooting_web.pdf**
Queensland Government website on managing feral pigs.	Provides a range of guides and fact sheets on managing feral pigs, including how to build certain traps. **http://www.daff.qld.gov.au/4790_8280.htm.** An easy to use guide on managing feral pigs in the Queensland context can be accessed here: **http://www.daff.qld.gov.au/documents/Biosecurity_EnvironmentalPests/IPA-Feral-Pig-Control-Manual.pdf**
New South Wales website on managing feral pigs	Provides a range material to manage feral pigs in New South Wales. **http://www.dpi.nsw.gov.au/agriculture/pests-weeds/vertebrate-pests/pest-animals-in-nsw/feral-pig-control**

Information Videos available through You Tube

Table 2 Available information videos on feral pig control

Type of video	Description
Best practice feral pig management channel.	Four videos that show feral pig control methods include trapping, baiting and the use of the hog hopper. Available from here: **http://www.youtube.com/playlist?list=PLEF48A4BBCF784EC8**

Building a heart shape feral pig trap (NSW Video).	Officer from NSW National Parks and Wildlife Service demonstrate the use of both a silo mesh and heart shaped trap and the panel trap for catching feral pigs. Available from here: **http://www.youtube.com/watch?v=cBB2OfHvbrc**
Feral Pigs in Australia 3 part series	Provides a background to feral pigs, their biology, ecology and impacts on the environment and agriculture. First video is an introduction, available here: **http://www.youtube.com/watch?v=bNSngI9ttgo** Second video is on marshes and the rangelands, available here: **http://www.youtube.com/watch?v=pUyFTCCVSuI** Third video is on the impact on landholders, available here: **http://www.youtube.com/watch?v=-rAwWon4r94**

Coordinated Feral Pig Campaigns in South Australia

2001-2002 – Annual Control at Innamincka Regional Reserve, South Australia

Annual control of feral pigs at Innamincka Regional Reserve in South Australia has been occurring since 2001. Control has predominantly occurred via aerial shooting. Figure 3 shows a summary of population estimates and pigs controlled year by year, indicating a general decline in numbers.

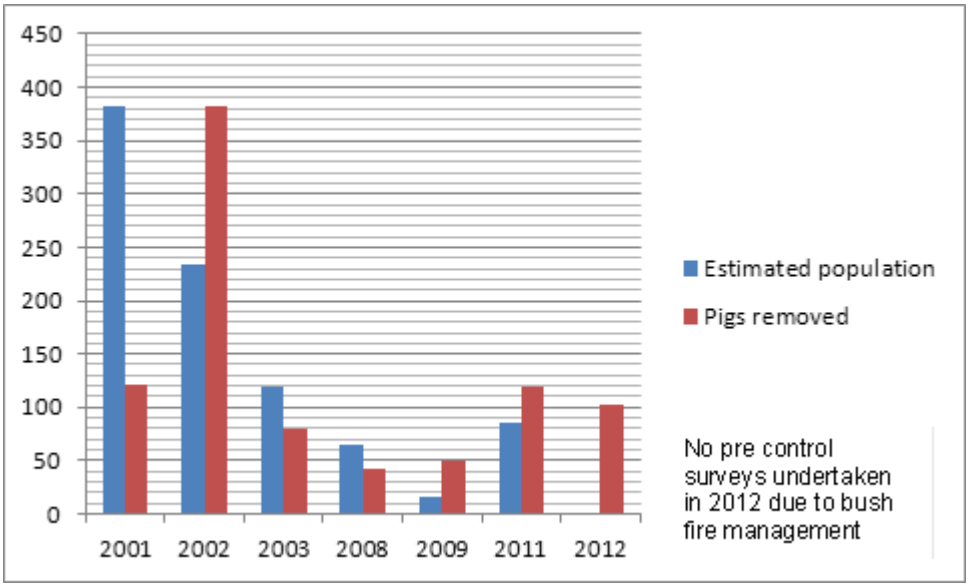

Figure 3 Control of feral pigs in Innamincka Regional Reserve, South Australia.

2002 – South Australia and Queensland Coordinated Campaign

In 4 days to 1st November 2002, around 12 000 square kilometres was controlled via aerial shooting of feral pigs on the South Australian portion of the Lake Eyre Basin. A similar area on the Queensland side of the border was controlled through aerial baiting with 1080 using a modified Cessna.

It was noted that conditions were ideal for the control program, given that it was dry and the pigs were concentrated. There were about 150 pigs on Innamincka, Gidgealpa and Cordillo Downs, and the shooting went down as far as Bollards Lagoon and Merty Merty. In a sample, up to 20% of the pigs were found to have Leptospirosis.

2004 – Pest Plan and Animal Survey – Diamantina River, Warburton Creek and Kalakoopah Creek

In 2004 a dedicated survey occurred by Rural Solutions SA across the Diamantina River, Warburton Creek and Kalakoopah Creek to detect pest plants and animals. This involved an aerial survey which flew from the 7th to the 14th of October 2004. Three observers plus the pilot flew in a helicopter aiming to survey the watercourses and up to 200 meters on either side of the banks.

The results from the survey found approximately 30 pigs in the region around New Alton Downs homestead and Pelican waterhole. No pigs or disturbance from pigs were found south of this location. North to Birdsville, only one pig was spotted near Pandie Pandie homestead, with very few signs of pig disturbance detected.

Photo: Jason Wishart - NSW DPI

2010-2013 – Protecting the ecological character of the Coongie Lakes RAMSAR Wetland

The aim of this project was to protect the ecological character of the Coongie Lakes RAMSAR wetland, South Australia, which is home to 74 waterbird species, 17 of which are migratory and listed under 26 treaties.

The project consisted of two components:

1. an integrated vertebrate pest management program (focusing on feral pigs), and
2. an Invasive plant management program.

The project is entirely on-ground biodiversity outcome focused, and although the primary investment location is the Coongie Lakes area, the project extends across the entire RAMSAR boundary including the Innamincka Regional Reserve & 4 neighbouring pastoral properties. These properties include:

- Innamincka Regional Reserve
- Coongie Lakes National Park
- Gidgealpa Pastoral Station
- Nappa Merrie Pastoral Station
- Durham Downs Pastoral Station

This project is still underway and is nearing completion at the time of writing the plan.

2010-2013 – The Diamantina Pig Project

The SA Arid Lands Natural Resources Management Board are currently funded under the Commonwealth Government's Caring For our Country program to assist pastoralists to reduce the impact of vertebrate pests, namely feral pigs.

This is a three year program commencing in July 2010 and ending in June 2013 and builds on previous consultation with the landholders in the district. There is an existing feral pig control program in the Innamincka Regional Reserve (DENR) covering the Cooper Creek catchment. A similar program is also occurring on the Queensland side of the Diamantina catchment.

The objective of the Diamantina Pigs Project is to significantly reduce feral pig populations on properties along the Diamantina-Wetlands River System in remote north-east South Australia and Queensland by June 30th 2013. This included the following properties: Alton Downs, Pandie Pandie, Clifton Hills, Cowarie and Kalamurina.

To date, the project has controlled over 100 feral pigs from the aerial program. In addition, individual landholder activity would have resulted in further control of feral pigs.

PART B – STRATEGIES TO CONTROL FERAL PIGS IN SOUTH AUSTRALIA'S LAKE EYRE BASIN

Vision, Desired Outcomes and Key Objectives

Vision

To minimise the impact of feral pigs on the environment, economy and health of the South Australian Lake Eyre Basin.

Desired Outcomes

1. **Community understanding on feral pig impacts are increased**
2. **Feral pigs are managed effectively**
3. **Resources are used effectively and strategically through collaborative and coordinated pest management planning**
4. **Strategic research is directed toward more accurately defining the feral pig problem and finding effective management solutions**
5. **Feral pig management is supported by appropriate resourcing**

In implementing these desired outcomes, the following pest management principles will be followed.

Pest management principles used to inform the plan

1. **Integration**
   Pest management is an integral part of managing natural resources and agricultural systems.

2. **Public awareness**
   Public awareness and knowledge of pests must be raised to increase the capacity and willingness of individuals to manage pests.

3. **Commitment**
   Effective pest management requires a long-term commitment to pest management by the community, industry groups and government entities.

4. **Consultation and partnership**
   Consultation and partnership arrangements between local communities, industry groups, state government agencies and local governments must be established to achieve a collaborative approach to pest management.

5. **Planning**
   Pest management planning must be consistent at local, regional, state and national levels to ensure resources target priorities for pest management identified at each level.

6. **Prevention**
   Preventative pest management is achieved by:

   - preventing the spread of pests, and viable parts of pests, especially by human activity
   - early detection and intervention to control pests.

7. **Best practice**
   Pest management must be based on ecologically and socially responsible pest management practices that protect the environment and the productive capacity of natural resources.

8. **Improvement**
   Research about pests, and regular monitoring and evaluation of pest control activities is necessary to improve pest management practices.

Key Objectives

1. To manage and reduce the feral pigs from the Lake Eyre Basin of South Australia
2. To prevent feral pigs from establishing in areas where they currently do not occur or are in low eradicable numbers
3. To integrate feral pig management into property management plans
4. To increase awareness and understanding of land managers and the general community about the damage that feral pigs cause and management options

Strategies and Actions

Strategies and actions have been based on each of the desired outcomes.

Desired Outcome 1 Strategies and Actions – Community accepts that feral pigs are an issue for the community as a whole.

Principles adopted: Public awareness, Consultation and partnership, Commitment

Strategies	Actions	Timeframe	Responsibility
1. Develop and implement awareness programs	• Copy of plan provided to all landholders • Copy of plan is provided to government land managers such as National Parks • Fact sheets and extension materials provided to all landholders	2013	Natural Resources SA Arid Lands
2. Incorporate feral pig plan into broader NRM plans	• Natural Resources SA Arid Lands to adopt plan and integrate into overarching plans	At the next review of regional plans	Natural Resources SA Arid Lands
3. Stakeholders are committed	• Landholders adopt individual property plans • Government landholders support the plan (National Parks)	2013	Government and Landholders

Desired Outcome 2 Strategies and Actions – Feral Pigs are managed effectively

Principles adopted: Planning, Integration, Prevention, Best Practice.

Strategies	Actions	Timeframe	Responsibility
1. Control and eradicate feral pigs from areas where possible	• All landholders implement individual property plans	Ongoing	Landholders
2. Train landholders in feral pig control techniques	• Provide feral pig extension material to all landholders	Ongoing as required	Natural Resources SA Arid Lands
3. Government agents are available to distribute relevant poisons for feral pigs or trap equipment	• Government agents are trained and available to provide poisons as required. • Government agents make available traps where possible	Ongoing	Natural Resources SA Arid Lands
4. Government landholders participate in coordinated campaigns (National Parks)	• All landholders contribute to coordinated programs organised through Natural Resources SA Arid Lands	Ongoing	Government and landholders
5. A buffer zone is scoped with the Queensland border	• Natural Resources SA Arid Lands to establish networks with Queensland land managers about a potential buffer zone	2013	Natural Resources SA Arid Lands and Queensland Land managers

Desired Outcome 3 Strategies and Actions – Resources are used effectively and strategically through collaborative and coordinated pest management planning

Principles adopted: Integration, Planning.

Strategies	Actions	Timeframe	Responsibility
1. Ensure good communication is set up between stakeholders	• As part of Annual Stock Return, Landholders send annual 'Monitoring Sheet' to Natural Resources SA Arid Lands about feral pig control and trends on their property. • Natural Resources SA Arid Lands collates monitoring sheets and develop annual feral pig trend report and send to all landholders and to Queensland Government.	Ongoing Ongoing	Landholders Natural Resources SA Arid Lands
2. List of possible resources available to be shared (feeding hoppers, traps) is made known to landholders	• Natural Resources SA Arid Lands communicate to landholders about resources that can be shared (traps or hog hoppers)	Ongoing	Natural Resources SA Arid Lands

Desired Outcome 4 Strategies and Actions – Strategic research is directed toward more accurately defining the feral pig problem and finding effective management solutions.

Principles adopted: Improvement, Best Practice

Strategies	Actions	Timeframe	Responsibility
1. Understand the ecology and biology of feral pigs in the Lake Eyre Basin	• Promote research of feral pigs in the South Australian Lake Eyre Basin through the Invasive Animals Cooperative Research Centre.	Ongoing	Natural Resources SA Arid Lands
2. Where available, implement new control techniques	• Natural Resources SA Arid Lands to monitor new control techniques and distribute to landholders where applicable	Ongoing	Natural Resources SA Arid Lands

3. Reviews of coordinated campaigns are documented, evaluated and reviewed into the plan achievements. Include mapping geographic distribution of pigs.	• Reports are developed after each coordinated campaign documenting the results and sent to landholders. • Future updates to plans incorporate results from previous control campaigns	Ongoing	Natural Resources SA Arid Lands

Desired Outcome 5 Strategies and Actions – Feral pig management is supported by appropriate resources

Principles adopted: Planning, Best Practice

Strategies	Actions	Timeframe	Responsibility
1. Investigate avenues of external funding to support the implementation	• Apply for external funding opportunities as they arise	Ongoing	Natural Resources SA Arid Lands & Landholders
2. Government agents are available to support coordinated control programs through bait distribution or supply of traps etc.	• Government is committed to supporting control operations through bait provision and other resources where available	Ongoing	Natural Resources SA Arid Lands
3. Community supports coordinated campaigns	• Landholders participate and support coordinated feral pig control campaigns where possible	Ongoing	Landholders

Review and Success Indicators

Review and Evaluation

This plan will be reviewed every 5 years

Success Indicators

Success indicators are listed below.

General

- Reduced economic, environmental and social impacts of feral pigs
- Greater awareness of, and commitment to, feral pig issues
- Timely response to sudden changes in pig numbers and associated control

Individual properties

- Incorporation of feral pig management into general property management
- Reduced impacts from feral pigs
- Increased awareness of feral pig problems
- Use of best practice to control feral pigs

Conservation

- Reduced impacts on native species and habitats from feral pigs

PART C – PROPERTY SPECIFIC PLANS AND ACTIONS

Individual property plans have been developed for each of the following properties. These have been issued directly to that property. Contact the individual property for details on the plan.

Property Plans that exist over the Cooper System

- Cordillo Downs
- Innamincka Reserve
- Gidgealpa

Property Plans that exist over the Georgina Warburton Systems

- Alton Downs
- Pandie Pandie
- Cowarie
- Clifton Hills
- Kalamurina

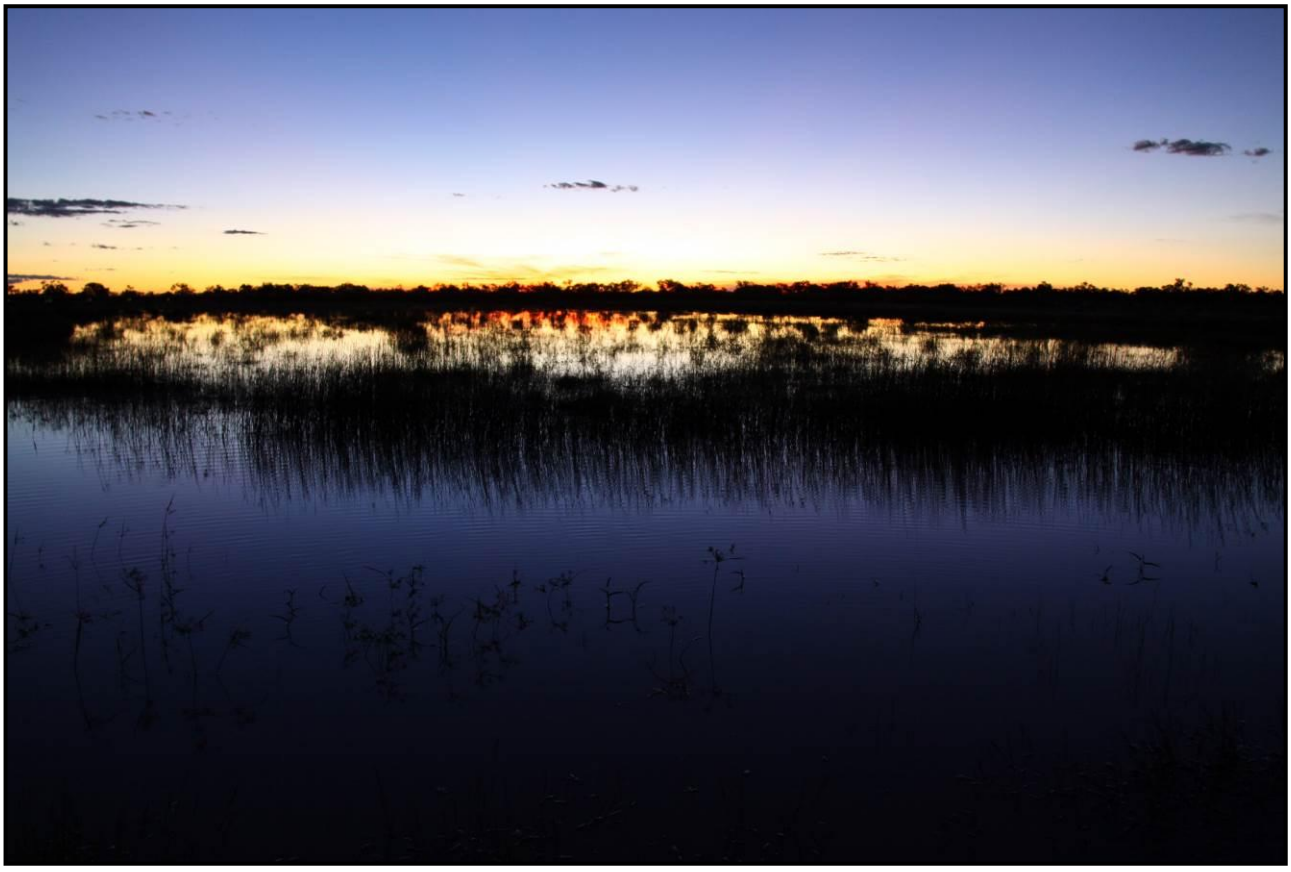

Photo: Desert Channels Queensland