A Ranger's Handbook Feeders, Trapping and 1080 Baiting Managing Feral Pigs for Biodiversity Conservation in Cape York



This series of handbooks helps you choose suitable methods for the control of feral pigs and the monitoring of their impacts on biodiversity in your region. The techniques it describes have been used on Cape York Peninsula, Australia, but the ideas can be applied in similar environments in other regions.

To choose what will work best in your area, it is important to understand the techniques that are available and their limitations. These handbooks provide a brief overview of the available options.

There are multiple techniques for both control and monitoring. Often the best approach for successful control is a combination of techniques (as opposed to just one). Knowing what impacts you want to monitor will drive your decision for a monitoring technique.

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Feeders



Background

Luring feral pigs to a site is essential for successful trapping and ground 1080 baiting. Free feeding (providing free-to-take food) with simple feeder systems is an effective method of luring and keeping pigs attracted to a site.

Purpose

Feeders are designed to slowly release food and keep the smell around longer. This will keep pigs feeding and checking the site as often as possible for a long timeframe, increasing your chances for camera monitoring, trapping or 1080 baiting.

Prerequisites

- Feeders
- Bait material.

Planning and Site Selection

Correct timing and site selection for feeders is critical. Firstly, choosing a time of year when pigs are short of food sources is important (often during the dry

season). Secondly, selecting sites near water is often ideal as pigs will live near swamps, lagoons and creeks to drink, wallow or forage and, therefore, there is a higher chance of them coming across feeder sites.

Ideally feeders should be placed in an area which can be serviced weekly and not too spread out. For example, 10 feeders a few kilometres apart along a road (100m off the road) would provide good coverage and easy access. Once you have identified your sites, selecting a feeder type for your area is next. All three options below are great, but your decision will depend on the materials available and site characteristics. For example, if your site is open, the double pot feeders will work best; if you have large trees available to screw a tree-mounted PVC feeder to, then this may be the best option.

Methods

Each feeding site will require:

- Feeder 3 options (see below)
- Trail camera + SD card
 - We recommend the Moultrie range of cameras
 - http://www.trailcameras.com.au/moultrie_s50i.htm
- Star pickets, plain fencing wire, zip ties (300 mm), light gauge tie wire
- Other options:
 - 2L soft drink bottles, filled with wet blood and bone (fertilizer) to attach to a star picket
- Bait
 - Cracked/whole corn or mixed grain can be obtained from local granaries, farms, feedlots or stock feed suppliers



Roc's stockfeed in Atherton have provided feral pig projects with cheap cracked corn for the past few years. The cheapest option is often from local granaries (whole corn, \$12/25kg)



There are several construction types available for feeders, each with its ups and downs. The left image shows a **double pot feeder** that has been baited with corn mixed with 1080 toxin and green food dye. This site had been pre-fed with unpoisoned fermented corn for weeks before the addition of 1080. This is to ensure the maximum number of pigs coming to the site. The middle image shows the **tree-mounted PVC feeder**, and the right image shows the **hanging pot feeder**.

Feeder Construction

Double Pot Feeders

- 2 x 420mm basics grower pot
- 2 x 150/165 cm star pickets

Firstly, place one pot upright as normal, and place the other upside down on top of it, so that the lips of the pots meet up (as seen in above picture). Using a drill, drill 4 holes (every 90 degrees) through the lips of both pots. The holes need to be large enough for a zip tie to pass through and secure the pots together. Make sure the holes remain aligned. When done, paint a mark on the lip of both pots where they were aligned and number the pots as a pair. This is so you can place them inside each other to save space until you get to site. The top pot needs to be cut nearly the entire way around at the top so grain can be poured in, but enough plastic is left so it acts as a hinge. On the side at the bottom of the bottom pot, cut a fist-sized hole with tin snips or a strong knife for the grain to flow out.

Upon arriving at site, construct the feeder by using four zip ties to strap the lips of the pots together. Find a site with shade and near a water or food source. Placing the pot on the ground, orientate the mouth on the bottom pot towards an opening where a camera may be placed. Pound two star pickets in alongside the bottom pot, pointing the holes on the star picket outward. Use wire to tie all the way around the bottom pot in a large circle. On the top pot, tie the wire off on one picket and feed it through some holes in the top pot and through to the other picket, to prevent pigs from lifting the pot up.

Tree-Mounted PVC Feeder

The tree-mounted PVC feeders are the most resilient to damage from pigs. The pot feeders tend to have a shorter life due to pigs thrashing them around trying to get more grain out. The tree-mounted feeder PVC feeder is made up of a 1.5m long piece of 150mm diameter white PVC pipe, a 90° elbow, a cap and 2 screw-in brackets. Note this is a revised version, similar to the one in the picture above but shorter, rounder and without a reducer. The benefit of this system is that it is cheaper and faster to install, needing only a large tree. The drawback is if you don't have trees (but feeders don't work well in very open areas). The lower height than the feeder in the picture (approx. 1.8m) makes it is easier to refill. The reducer on the 90° elbow was removed due to blocking issues. This is a great, easy to use feeder.

Hanging Pot Feeder

The hanging pot feeder is a simplification of the double pot feeder. It was designed to hang and move so it would be more resistant to damage from pigs trying to get more grain. It also doesn't use any star pickets, making it cheaper, and easier to transport and setup.

The hanging pot feeder is composed of a pot (variable size) with a pot saucer that can fit snugly to the top of the pot as a lid (and refill area). Holes are drilled in the lid and feeder and then the two are zip-tied together. On the side at the bottom

of the pot, cut a fist-sized hole for the grain to flow out. A rope is used to hang it from a tree branch so that it is hanging barely an inch (2.5 cm) off the ground.

Camera setup

An infrared trail camera may be used to monitor animal visitors to the site. These allow you to determine what species are coming to site, mobs identify of pigs through unique individuals, estimate population size, monitor feeding activity and estimate control success through population/visit changes. They also help inform when to bait or trap. The feeder and camera should both be placed in the shade if possible to prevent false camera triggers. Place the camera approximately 5m from the feeder, but no more than 10m. The camera can be placed on a star picket or a nearby tree about 1.5m high (if you select your



feeder site well you can have a tree at the right distance).

The camera (motion/heat activated) is set up to take pictures all day long. Depending on the application, video may also be used. Set the camera to take one photo at 5-10 minute intervals to avoid having too many photos to process, wasting battery life and running out of SD card space. This will give 6-12 photos an hour which is sufficient to estimate a local population size (approximate number of animals within a few kilometres of your feeders). If you aren't visiting

the site frequently, you may wish to set the camera at a 10 minute or longer interval to ensure the batteries last in between checks.

If funding doesn't allow for cameras, you can still determine whether pigs have been at site by the disturbance seen and whether the feed has been eaten. Birds will only peck at the grain and cattle may nudge it around. Pigs will scatter the grain everywhere and flatten the area out. Pig tracks will be seen and often a dusty 'carpet' will form. Pigs may also leave mud rubs on nearby trees, pickets or the feeder itself, and obvious walking 'pads' (tracks) to the feeder may develop.



Obvious signs that pigs have been feeding frequently here. Pigs have flattened the area near the feeder and no leaf litter is present. The feeder itself is broken and nearly falling over.

Fermenting the grain

The grain is best fermented in a trough of water at a remote location because of the smell. 25kg bags need to be split in half due to the swelling of the grain (otherwise bags will split and 25kg will become 40kg). Once split use zip ties at the top of the bags to tie them up. Submerge the bags in a trough of water and within a week the grain will be fermented. You can continue to use this water throughout the year, ensuring that you keep adding water as needed. A lid (roofing iron works fine) may be used to isolate the smell and decrease evaporation. The trough should be placed high enough that pigs cannot get in the trough. For every bag taken out, replace it with a new bag, remembering which bag is old and new. All bags should be fermented for a week.

Pre-feeding and baiting strategy

Once the feeders are set up, place a pile of grain in front of the feeder, and some inside, until pigs become comfortable with the feeder and how it works. Once they have taken the first lot of grain place all the grain inside the feeder which will keep pigs at the site longer due to the slow release of grain. Some of the pot feeders may be destroyed by the feeding activity, but they can be replaced if needed.

'Pre-feeding' is done to attract pigs to the feeding sites, before you use the 1080 toxin (or set up a trap). Pre-feeding may occur for only a week, but



will most likely need to be done for a few weeks or more, depending on the season. Once pigs arrive at most of the feeding sites in good numbers you can administer the 1080 or set up the trap. When using 1080, the grain is dyed bright green with food dye, so it is less attractive to birds and people know it has been poisoned. The 1080 will breakdown as the grain decays or if it is rained on. Grain is primarily used to prevent non-target attraction, especially dingoes. This system works best with fermented grain and has been used successfully in the Burdekin River catchment and across central Cape York. Mobs of over 40 pigs have been removed using this technique.

At trapping sites, a feeder and trap work well in conjunction with each other. The feeder can be used to attract pigs to the site. Once pigs arrive, the trap (placed nearby but not too close) can be fed and set (and not the feeder). When pigs are culled in the trap, the feeder can be used again to keep attracting pigs to site.

Trapping



Background

Trapping is an effective on-ground control method, especially for areas where aerial shooting is difficult due to thick vegetation. Trapping involves baiting a site to attract pigs to the site, then trapping and culling them humanely.

Purpose

Trapping is a great method to use in conjunction with aerial shooting. Like 1080 baiting (below), it uses a feeder to attract pigs to the site first. Whilst aerial shooting is successful at reducing and maintaining populations, many pigs will be conditioned to the sound of a helicopter and will seek cover when they hear a helicopter. Traps are great at targeting these individuals. Traps are also great in areas where pig density is low or helicopters can't shoot due to thick vegetation. Trapping is also useful to protect important cultural or environmental sites.

Prerequisites

Trap

Bait material.

To conduct the work without a contractor you will need all three of these:

- Firearm licenses
- Gun safe (for base and vehicles)

• Firearms

• Lockable carry case for safe field use.

It is also helpful to:

- Know reliable locations of pigs
- Have access to sites.

Planning and Site Selection

To see a trap-mechanism live in action on a panel trap type this URL into your web browser:

https://youtu.be/khTa6oBY6N4

A successful trapping or baiting program is based on good information, planning and site selection. Traps can be placed at any site that have feeders currently setup, or sites similar to those outlined in the previous 'feeders' section. Selecting the type of trap to use is important – these can be more permanent traps like the silo trap, or mobile traps like the panel trap shown in the picture on the previous page.

Method

Trapping involves 'free-feeding' of pigs at a site until they are comfortable with the presence of a trap. Once they are comfortable and most or all of the mob is moving into the trap to feed, the trap can be set.

Several types of trap exist, the most common being panel, box and silo traps; the latter being a more permanent trap type (Figure 1). We recommend panel traps or silo traps for ease of transport and setup. The most successful way to operate a trapping site is to have a trap and a feeder (see next page) at the same site and use them alternately. Initially, start free-feeding at the feeder, as described in the previous 'feeders' chapter. Once pigs are comfortable with the feeder, stop putting feed in the feeder and start putting feed inside the trap. Once pigs are comfortable in the trap, it can be set. A trail camera is helpful to monitor pig numbers at trapping sites and gauge trapping success.



Figure 1: A silo trap (top) and panel trap (bottom). A box trap is similar to a panel trap; however, it is welded solid and often has a top. (Source: Government of Western Australia, DPIRD)

1080 Baiting - Ground



Background

1080 baiting is one of the most efficient methods of feral pig control, especially in remote regions with limited resources. Sodium fluoroacetate is the main toxin in 1080 used for poisoning feral pigs. It is produced naturally in around 35 native plants in Australia, so native animals are generally more tolerant to the toxin than introduced animals like pigs (Table 1). 1080 is water soluble and biodegradable, enabling it to be broken down naturally in the soil to a harmless substance. It also does not accumulate in the food chain so does not affect animals that may eat a dead pig. If used correctly, 1080 is a safe substance to use for pig control, without having to worry about adverse effects on people and most non-target animals. It can be delivered at bait stations, along roads by vehicles or from the air. Feeders are intended to keep pigs around for the longest period possible by keeping the grain wet, smelly and releasing it slowly. This allows for a higher detection rate by cameras or humans and means pigs will return to sites daily to feed more.

The use of 1080 is subject to strict regulatory controls in Queensland as required by the Health (Drugs and Poisons) Regulation 1996. 1080 is a <u>highly toxic</u> chemical and cannot be administered by anyone. You must contact the local council to get an authorised 1080 officer to administer the 1080 for you. Commercial baits (small sausage like baits containing the 1080 toxin within) may be distributed by

the property owner (or authorised agent), however, these must still be obtained from the local council and anyone delivering baits must undergo training from the 1080 authorised officer.

Purpose

1080 baiting is a great method for targeting pigs that are in inaccessible areas or are proving difficult to control using other methods. 1080 baiting for pigs (and feral dogs) is particularly helpful for:

- Removing pigs that manage to escape aerial shoots
- Removing pigs in specific areas where trapping or shooting is difficult e.g. thick vegetation
- Targeting problem individuals that are causing heavy turtle nest damage

Table 1: Relative resistance of various animals to 1080. Most feral animals have a low resistance to 1080, e.g. dogs, foxes and cats. Bait selection can also exclude non-target animals, e.g. wallabies don't like fermented grain and will not consume any, however, pigs will.

Fluoroacetate		
Animal	mg/kg body weight	Relative resistance (Dog = 1)
Dog	0.1	1
Fox	0.2	2
Cat	0.3	3
Wallaby	0.3	3
Sheep	0.3	3
Cattle	0.4	4
Rabbit	0.4	4
Pig	0.6	6
Possum	0.7	7
Magpie	0.9	9
Tiger quoll	1.8	18
Human	2.0	20
Sparrow	3.0	30
Duck	4.8	48
Rat	7.0	70
Domestic chicken	7.5	75
Hawk	10.0	100
Goanna	55.0	550
Frog	1000.0	10 000

Prerequisites

1080 is a regulated toxin and there are specific rules applying to its use that must be adhered to:

 Have permission from TO's and the owner of the land (council, private land owner, prescribed body corporate) to 1080 bait on the land of interest

- Have an authorized 1080 officer to administer 1080 or have access to commercial 1080 baits to distribute (obtained from an authorised officer)
- Have safe toxic material handling practices in place
- Notify neighbours and have adequate 1080-signing on the property
- Pre-feed bait stations until pigs are consistently feeding
- Adhere to the strict instructions and precautions provided by the authorised 1080 officer

Planning and Site Selection

1080 is placed at feeder sites (see previous 'feeders' section) that are already setup and have had a couple weeks of frequent pig activity.

Method

The method is similar to the methods shown in the 'feeders' section. Plans should be made to acquire 1080 bait once pre-feeding commences. Your local council often has an authorised 1080 officer and can add 1080 to your feed. Once prefeeding is complete and large numbers of pigs have been attracted to the feeder sites, 1080 can be administered. Extreme care must be taken when administering 1080 as spills on clothing, shoes or the ground can affect domestic dogs. The authorised 1080 officer should give you all the information you need. Adequate signing at property entrances and baiting sites is essential. Neighbours and visitors must also be warned. 1080 baiting at feeder stations should be checked every day after baiting. After a week, any remaining bait should be buried or burnt to reduce the chance of non-target animals eating the bait material.

1080 can also be administered using meat baits or pre-baited commercial products. These baits can be thrown from vehicles, tied to stakes/trees or buried to avoid affecting nontarget animals. Meat or commercial baits are effective prevent turtle nest to predation as they can be buried near nests.



1080 Baiting - Aerial



Background

Aerial baiting is a very effective and cost-efficient method of pig control over large, remote and inaccessible areas. Hundreds of 500g meat baits injected with 1080 are dropped from an aeroplane, ideally in areas known to have pigs. It can be used in conjunction with other methods and is great to supplement aerial shooting programs to remove the pigs that escape the helicopter. This method is broad and may negatively affect non-target native carnivores such as dingoes or quolls.

Purpose

1080 aerial bait drops allow large-scale control in areas that may not be accessible for other ground control methods, and aren't favourable aerial shooting areas. It is useful to remove pigs from densely vegetated areas, turtle nesting beaches or areas known to have high pig density.

Prerequisites

The prerequisites are the same as for 1080 ground baiting, with the additional requirement of an airstrip and plane.

Planning and Site Selection

Aerial baiting is most effective when baits are dropped in habitats that are attractive to pigs, such as along or near water courses or across movement paths. Rivers, beaches, linear vegetation patches and lagoons are ideal areas to drop baits. Plan and map your bait runs and monitor any feeders, traps or other monitoring tools to see if there is an impact on the feral pig population.



Aerial shooting on the floodplain in the foreground is easy, however, the dune scrub in the background provides refugia for pigs during shoots. Targeting this dune scrub with an aerial baiting program would complement an aerial shoot very well.

Method

Once you have identified your target areas, the bait can be loaded into a plane. A GPS device can be used to stay on track and accurately drop baits. Baits should be dropped to be spaced approximately 100 m apart; this often equates to one bait dropped every 1-2 seconds. More detail on aerial baiting can be found in specific baiting manuals online.

How Safe Is 1080?

If a hunter shot a 60 kg feral pig that was in the latent period following ingestion of 3 kg of 1080 bait (at a rate of 1152 mg 1080/kg) and based on the unlikely assumption that half the ingested poison has become evenly distributed through the carcass, that hunter would need to eat 36.1 kg in one sitting before being at risk. (Source: Qld. Gov.)

Chemical Fencing

Background

Chemical fencing is a method of 1080 baiting with strategically positioned feeders to form a 'chemical fence' through which target animals must pass. Often 10 feeders are placed 1 km apart along a linear boundary between two habitat types, e.g. between dune scrub and beach.

Purpose

This method is designed to target pigs that evade aerial shooting and are potential problem animals for turtle nest predation. The 'chemical fence' intercepts pigs close to the coast that are in search of new food sources. This concept could be applied to protect other sensitive areas such as wetlands or rivers. This chapter, however, will focus on applications for turtle nest protection.

Prerequisites

- The prerequisites are the same as for the 'feeders' and '1080 baiting – ground' chapters.
- Have a suitable location to intercept pigs

Planning and Site Selection

The timing and site selection for this

method to work are critical. Across Cape York, pigs prefer to feed on bulkuru (water chestnut, *Eleocharis dulcis*) or water lilies at lagoons. As these lagoons dry up and this food resource disappears, pigs travel further in search of food.



Identifying the time that pigs begin to appear on the beach is critical for this method to work, as the timing of free-feeding at bait stations needs to commence about a week earlier.

In the Biodiversity Fund project, an 'indicator' lagoon was selected to help identify the time when pigs change food sources from wetland vegetation to turtle eggs. The final stages of this lagoon drying up often coincided with the first recorded pig tracks on the beach or turtle nest predation. When rangers noticed this lagoon was nearly dry, free feeding at feeders in the chemical fence commenced (shown in Figure 2).

Selecting sites for a chemical fence that may provide the most protection for the coastline is also important. It is also helpful to anticipate locations that maximise the Site Selection is Everything In Figure 2, two chemical fences are located near larae inner estuaries where it is least likely pigs will come from. By placing the chemical fence in these locations, it should protect the 10 km of coast directly adjacent to the chemical fence, as well as the areas behind estuaries, the potentially protecting up to 40 km of nesting habitat.

chance of intercepting pigs such as along pads (tracks made by animals).

Method

The method is the same as shown in the previous 'feeders' and '1080 baiting (ground)' sections, except several feeders are placed in proximity to each other in a line to intercept pigs (as in Figure 2). Feeders are refilled with grain once or twice a week until pig activity is persistent. Once there is good, consistent activity at sites, grain baited with 1080 and dyed green can be administered. Trail cameras can be used to monitor the numbers of pigs visiting the feeders and to identify individuals or mobs that may be visiting multiple feeders. If trail cameras were installed when pre-feeding began, it is possible to assess the number of pigs removed by comparing pig visits before and after 1080 baiting.

Case Study: 2013 Chemical Fencing Trial for Turtle Nest Protection

In a pilot turtle nest protection project conducted in June-July 2013, 20 feeders were installed along a beach near Aurukun (see Figure 2). The feeders were refilled frequently until a substantial population of pigs were persistently visiting them. Using trail cameras, the pig population was monitored over two months. In June, very few pigs were recorded at feeder sites, with pigs even seen (by trail cameras) walking past feed. The crew returned one month later in mid-July and resumed pre-feeding the feeders. At most sites feed was eaten within days of returning in mid-July, highlighting the



importance of timing for this method. After 10 days of pre-feeding (and turtle monitoring) 1080 was added to the feed, resulting in a severe drop in the pig population. This reduced the predation of turtle nests from 100% of nests eaten in 2012, to only 24% of nests eaten in 2013; a huge success, and below the ecologically acceptable level of nest predation (Figure 3).



Figure 3: Initially it took a month to attract pigs to feeder sites persistently. By the 29th of July 130 individuals were identified at feeder sites. Once pigs were consistently visiting sites, 1080 was administered and a severe local population reduction resulted within two days. Over time a few pigs returned but never in the numbers before baiting occurred.

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