

KORU BIOSECURITY MANAGEMENT

C. JACK CRAW, PRINCIPAL
jackcraw57@gmail.com
+64 21 2229064

To: Brendon Pasisi, Director DAFF
Sauni Tongatule, Director Department of Environment
David Moverley, SPREP
Huggard Tongatule, Department of Environment

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Progress Report on Niue Feral Pig Management Pilot Programme

I travelled to Niue April 10 to April 24 2015. Friday to Sunday were spent mapping Niue cellphone coverage. This was found to be patchy, and strong only in a short area north of Alofi and a reasonably wide band from Alofi to Avatele and Hakupu.

Two meetings were held with Brendon Pasisi (April 13, April 23), and daily meetings with Programme Manager Huggard Tongatule. The need for the community to be provided all information regarding the toxin trials was confirmed, i.e. secrecy for security purposes was deemed unnecessary and unacceptable to the community. At the first meeting on Monday 13 May, Brendon raised a range of useful suggestions and questions, including (my responses in italics):

- Use of transponders on pigs to get a picture on pig movements. *This will be considered if the cameras do not provide enough useful information. However I am reasonably confident that the cameras will provide sufficient information, very cheaply, to enable effective management decisions to be made.*
- Use of smaller transportable traps. *Small traps are very useful to catch a single pig, however once it is trapped, no cohort pigs will approach a trap for years or perhaps their lifetime. This is why it is extremely advantageous to use lured enclosures to entice an entire pig family before triggering the gate. If lured enclosures or the other methodologies are not proven effective, use of small traps will be considered. These traps would likely be effective for a very short period of time, and would need to be implemented in high numbers (40+). Also Niue pigs are typically not overly hungry so may not select food in a cage when alternative food is nearby. This is in contrast to most sites in New Zealand where these traps are typically utilised.*

- Do we need to test Encapsulated Sodium Nitrite (ESN) toxin on chickens and uga? *The bait boxes are designed so that only pigs can open them (dogs are a very low risk). Chickens and uga would not be able to open the boxes. In addition the lure is coloured green so is unattractive to birds. The toxicity of ESN to crustaceans is extremely low and the lure is likely to be unattractive. So overall the risk to all birds and uga is negligible to nil*
- Would use of sow urine be beneficial? *Yes, sow urine is effective, and extremely so when the sow is in estrus. It is not easy to reliably obtain and store uncontaminated product, however if no other effective lures can be found then this will be considered.*
- DAFF is keen to implement knockdown programme after trials have established most effective methodologies. *This is great news.*
- The knockdown programme will need to be implemented, hand-in-hand with a regulatory programme, including pig ID and possibly other measures. *Agree entirely. Any feral/wandering pig control programme would provide only short-term benefits unless accompanied by a domestic pig management programme that addresses the causes of pig release.*
- Most piggeries are dirt-floored, and this poses a disease risk to piglets. Sick piglets are not uncommon. Most litters are larger than required for domestic consumption. It is reported that sick and surplus piglets are sometimes released. These released pigs are more likely to be boars. *Useful information. The control programme will confirm actual sex ratios, and will provide some indication as to the ratio of released vs feral pigs.*
- One effective way to eliminate release of sick and surplus piglets would be to licence a restricted number of pig breeders, who would operate piggeries to high hygienic standards, and sell weaners to the general population. This would also save costs in that breeder boars and sows would not need to be held and fed by all pig owners, fewer deaths due to piglet mortality, better pig breeding programmes, and overall compliance with pig management regulations. *This is an excellent idea. All weaners sold should be sows or barrows, thereby minimising and eventually eliminating the feral pig problem entirely due to lack of boars in the wild (if the programme is accompanied by an Island-wide feral pig control blitz).*
- The domestic pig identification programme could still provide for hunting and other feral pig management programmes, including the current bounty. *Agree. DAFF should consider earmarking rather than tagging, as marks are permanent, readable from a distance, and considerably cheaper than tags.*
- Nipple water dispensers are a cheaper and more effective means (than troughs) of providing water to domestic pigs. *Agree, this is an excellent*

suggestion. Provision of regulated water supply is vital to preventing release from sties, as currently most owners need to water enclosed pigs 2-4 times daily and this leads to release when owners are absent. Nipple dispensers use far less water, are less likely to be broken or upended, and do not become contaminated. DAFF should investigate provision/ subsidy of dispensers to all pig owners or perhaps all owners that comply with regulations.

- *There are currently perhaps only 200 household with pigs. Useful information.*
- *The community will need to know what is being done to deal with feral pigs and what rules will affect them e.g. will my pigs be shot/ poisoned/ trapped if they get out, what ID rules will be created, what rules will govern the keeping of pigs. Agree. The Programme includes a community education component.*
- *There has never been any research on quantifying pig impacts on uga, and this is required. Do pigs predate uga only during migration, or around coconut trees, or do they dig uga up? Agree, this work is required for many reasons e.g. to possibly establish means of minimising impacts, to justify feral pig control, and as reason for external agencies to fund control programmes. I have commenced investigation into possible funding sources, determination of MSc/ PhD/ external contact as options, and other assistance.*
- *Cellphone coverage is very patchy and can be unreliable. WIFI coverage is improving but this option is unlikely to provide coverage over distance in the bush. Unless these technical issues are solved, there is little likelihood that you will be able to make lured enclosures effective. Agree that if we cannot fly images, we will not be able to make real time decisions that are required by the enclosures. Note: in subsequent discussions with the Niue Telecom Technical Manager, it has been confirmed that the 2G network can send messages to trigger the gates but cannot send images to allow for real time decisions to be made. However I am working with Niue Telecom and experts in New Zealand to design an alternative that should be reliable and cost-effective. Feasibility and reliability will be tested before any other work is done on the enclosures.*

On ground work

Procedures for construction of lured enclosures and placement of toxin bait dispenser sites were established (refer Attachments 1 and 2). One lured enclosure was built and both toxin trail sites were established. All four surveillance cameras were deployed. Huggard and his staff (Daniel and Hele) became thoroughly proficient in use of the cameras and retrieval of images produced.

Potential issues involving hunting were discussed. These included:

- Privacy/trespass by dogs and hunters: unlikely to be considered an issue by landowners except for a small number of tapu sites. However entry of dogs and hunters in the Huvalu Forest Conservation Area will need to be controlled.
- Risk of hunting dogs attacking domestic pigs: this is unlikely to be problematic for pigs fully contained in sties, as Glen Osborne is confident that his dogs will not jump into sties. However uncontained domestic pigs would very likely be attacked. It will be necessary for pig owners to be forewarned of hunting activities before hunting commences. Hunting will not commence near to any dwellings and piggeries, however it cannot be guaranteed that dogs will not chase pigs into areas with piggeries.

Successes to date

- The cameras are filming pigs, and getting good data on visitation rates and times.
- Pigs visiting the bait boxes do so frequently, and after initial caution will take lure and bait mash (not loaded with toxin). Pigs typically eat sparingly, usually 1 bait ball at each visit. The first pig visited the boxes 6 times over a 44 hour period, for periods 2 minutes to 45 minutes (av. = 20 minutes), at intervals of 23 minutes to 5 hours 2 minutes (av. = 2 hours 45 minutes). Data gathering is ongoing.
- Learnings included:
 - Pigs preference for shady rather than open sites for placement of all installations.
 - Little or no requirement for placing lure over long distances (30+ metres) to attract pigs. Recommended distances will be refined.
 - Pigs are attracted by the specific lure but not by grain.
 - Pigs will eat the mash (base for the toxin) but require 1-3 days to get used to it. This is identical to the New Zealand situation.
 - Staff need to determine (from the cameras) how many pigs are visiting the sites before laying bait mash balls. Only 1 ball per pig is likely to be needed.
 - Risks to dogs and chickens appear to be negligible to nil.
- The community is very supportive of all 4 trial programme options, and people have not been over-inquisitive or meddled with the sites.

- Huggard and I were filmed and interviewed for the Broadcasting Corporation of Niue (BCN), describing the pig issue and elements of the programme. I stressed the contributions from SPREP, DAFF and DoE however this wasn't included in the clip. It can be seen (from 6.00 minutes) at: <https://www.youtube.com/watch?v=yzRlk8PFxao>

In a debrief with Brendon after the end of Week 2, the following matters were raised:

- Huggard's performance has been excellent, particularly in mastering the cameras and associated electronics, but also in motivating his staff and working hard to install the many pieces of equipment. He has also made many useful suggestions regarding lure types, placement of enclosures and bait boxes, informing the community, and snare design/ placement. Huggard has also been very effective in keeping the community informed and accepting of the programme. I am very confident that he can manage whatever programme that is developed.
- The DAFF and DoE staff have worked very well. They understand the technological challenges and ecological and economic issues posed by pigs both feral and domestic. This staff involvement is likely to lead to widespread discussion in the community and the community accepting the need for better domestic pig management.
- The snares I supplied are unlikely to be particularly useful. Although the cables are light and strong, the eyelet design does not prevent the snare loosening if the tension is slackened and the cable is relatively stiff which would tend to prevent tightening, so pigs are likely to be able to wriggle out of the snares. Further work is required. Niue has recently signed up to an international animal welfare standard so it is likely that the use of snares may come under scrutiny. In any event it would be strategically advisable to develop alternatives to snares.
- Use of grain as a lure is currently ineffective, so the bait feeders should be removed from the field and retained for alternative purposes - perhaps for luring domestic pigs or used on a chicken farm. The bait feeders work very well indeed (timing, dose rates, ease of operation, waterproof, etc.) so they will undoubtedly be put to good use.
- The food options that pigs currently utilise appear to offer the best results as lures e.g. coconut, yam, kumara. This is somewhat in contrast to New Zealand, where feral pigs accept a wide range of food types. Huggard will trial split coconuts immediately, as supply is plentiful and essentially at nil cost.

- Brendon has concerns regarding reliability of Telecom's systems. Prefer that single kill trap be developed, e.g. Landcare Research's spring loaded trap. The lured enclosures appear expensive and are not mobile. *Agree re need for transportable version of gate assembly to be developed if telemetry issues can be solved. The lured enclosures are individually relatively expensive but, when working, offer the lowest running costs of all options (very low labour cost) and are the only option capable of capturing all pigs in an area. If made transportable, then costs would fall further.*
- Please talk to Taso Tukuniu, banana plantation owner at Hakupu. Need for pig control there. *Agree, will do this.*
- Brendon is concerned that the lured enclosures are not transportable and this inflexibility will make them not cost-effective. *Agree. The current gate assembly is a prototype for "proof of concept" purposes. A transportable version of the gate mechanism will be developed if the enclosure system can be proven to be successful.*
- I stated that if remote control technologies cannot be made to work reliably, then a concerted hunting operation could possibly reduce pig numbers. This might require 6-10 hunters working together for 2-4 weeks. We will gain a greater understanding of the possibilities when Glen Osborne visits in June. I will cost this option.

After this trip, the Operational Plan was revisited. The following issues remain as problematic (my recent comments in italics):

- General abundance of food for pigs in gardens and in wild - likely to make it difficult to entice pigs into enclosures and to bait stations. *This has necessitated using local crops and food sources as lures. Huggard is trialling coconut and will trial planting cassava in the enclosures if need be.*
- Accurate monitoring of coconut crab population (i.e. outcome monitoring of pig control programme) would be very difficult. Any improvement in crab numbers (after pig control measures) would not be immediate, would be difficult to measure, and is likely to be compromised by presence of crab harvesting. *The need for ecological study of coconut crab remains a high priority for the Department of Environment.*

Thanks to: Brendon Pasisi, Sauni Tongatule, Huggard Tongatule, Daniel, Hele, David Moverley and BCN

ATTACHMENT 1

Checklist for lured enclosures

1. Site requires cellphone coverage, needs to be 3 or 4 bar (or equivalent WIFI)
2. Establish that pigs are frequently in the area of the planned site
3. Landowner permission has been granted
4. 4wd access within 50 metres of site, to enable water to be carried to tank, ease of construction etc.
5. Site is private, to minimise disturbance, sightseers and possible meddling with or accidental triggering of cameras and gates. Also to minimise human presence and scent, which can scare pigs off.
6. Site is on flat ground, to prevent pigs getting under the netting
7. Site is adjacent to plantations and forest, to maximise likelihood of pig interaction. Ideally sites should be right on the edge of the forest-plantation interface, with gate facing the forest and close to pig tracks
8. Area is not commonly visited by dogs, to minimise unnecessary triggering of cameras. This is not a vital requirement, as even if dogs are inadvertently trapped they can simply jump out.
9. Camera should be pointed south, to avoid triggering by strong sunlight.
10. Camera should preferably be in the shade
11. Because the installations are not readily moveable, it is necessary to lure pigs in from a wide area. It is likely that water will be a very effective lure in the dry season

ATTACHMENT 2

Checklist for toxin bait box sites

1. Establish that pigs are frequently in the area of the planned site.
2. Landowner permission has been granted for the site.
3. Site is private, to minimise sightseers and possible meddling with or accidental triggering of cameras and boxes. Also to minimise human presence and scent, which can scare pigs off.
4. Site is adjacent to plantations and forest, to maximise likelihood of pig interaction. Ideally sites should be right on the edge of the forest-plantation interface.
5. Area is not commonly visited by dogs, to minimise unnecessary triggering of cameras or risk of poisoning.
6. When toxin is added to lure, warning signs need to be placed on the bait boxes (signs to be supplied).
7. Camera should be pointed south, to avoid triggering by strong sunlight.
8. Camera and bait boxes preferably to be all in the shade.
9. Grain appears to be a poor lure, however the dedicated pig lure (green gel) appears to be effective.
10. It is likely that water will be a very effective lure in the dry season, if pigs need to be lured to the sites.