

**RESTORATION OF NU'UTELE & NU'ULUA ISLANDS,
ALEIPATA ISLAND GROUP, SAMOA**

**REPORT OF EXPEDITION TO TRIAL THE CAPTURE AND
HOLDING OF FRIENDLY GROUND DOVES
(*Gallicolumba stairi*)**

October 2005

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**For
Samoa Ministry of Natural Resources, Environment & Meteorology (MNRE)
&
Secretariat of the Pacific Regional Environment Programme (SPREP)
&
Pacific Programme of the Cooperative Islands Initiative (PP-CII)**

Background:

The restoration of the Islands of Nuutele and Nuulua is a priority of the Government of Samoa and the communities of Aleipata District. Planning is well advanced on a key element of this, the eradication of Pacific Rats (*Rattus exulans*) by aerial spreading of toxic baits in mid-2006. The Friendly Ground Dove has been identified as a non-target species that may be at risk of taking the baits and one for which the Nuutele and Nuulua populations are significant. Several approaches for safeguarding these have been discussed and this expedition was designed to test the feasibility of the preferred approach, namely the capture and holding of birds in a safe situation on Nuutele during the aerial operation and their release once the baits are non-toxic.

Objective:

To answer the question:

Can ground doves be caught in sufficient numbers in a timely way at the same time of the year that the aerial drop is planned (June-Sept.), and be successfully held in captivity on the island?

Summary of findings:

A team of up to 9 people spent 6 1/2 days on Nuutele undertaking fieldwork from 4 to 11 September 2005. Mist-nets were set at sites along the summit ridge, alongside a gully in the interior of the island and on the flat behind Nuutele Beach. No doves were flushed during 8 drives to these nets. Only one dove was seen at a distance during searches of the island and no birds were heard. It was concluded that the population is

now very small, maybe no more than 5-10 pairs, and that catching sufficient birds immediately prior to the rat eradication was impractical.

It is recommended that a study is carried out urgently using DNA analysis to determine the distinctiveness of the Samoan form of the Ground Dove. If this proves the bird to be distinct, further work will be needed to protect those birds remaining in Samoa, including on Nuutele and Nuulua, before the rat eradication. Captive breeding may be the best option. If not distinct, the rat eradication should go ahead. Populations of doves would either recover on Nuutele and Nuulua (if the ants are managed there) from birds that survived this operation, or have to be restocked from overseas.

Expedition details:

Personnel:

MNRE: Tapa Suaesi (4-5th), Samani, Filipino, Nerissa, Eti, Joe Reti (4-11), Yoshi Akasaki (4-8), Toni Tipamaa (6-9), James Atherton, Tommi (8-9), Faafetai Uitime (4),

Technical Advisor: David Butler, Nelson, NZ (4-11)

Aviculture Expert: Glen Holland, Director, Auckland Zoo, NZ (4-11)

Assistants from local community: Nuutele, Poe, Pati (5-11)

Trip Diary:

Fri 3 Sept.

Holland & Butler arrived Samoa 2.55am

Planning meetings – MNRE staff – Director, MNRE

Shopping for equipment & food

Sat 4

Team assembled at DEC 8am. Departed for Aleipata 11am. Left Marine Centre wharf for Nuutele Island 3pm. Team all on Vini Beach, Nuutele 5pm

Sun 5

Team left camp at Vini 8.15am. Arrived on island summit plateau 9.30am. Cut line and set 5 mist-nets by 11.40am. Carried out two 'drives' towards nets. Furled nets and began return to base 2pm. All to camp 3.50pm.

Mon 6

Carried out two drives to nets. Established new 5-net site in stream gully. Two drives to new set-up. Furled nets.

Tues 7

One drive to gully nets. Marked bird transect and took photopoints down to Nuutele Beach. Cut two net lines in flat behind Nuutele Beach

Wed 8

One drive to gully nets. Shifted and set up four nets in upper site behind Nuutele Beach. Two drives to these nets

Thurs 9

Heavy rain am. Carried equipment for overnight camp to Nuutele Beach. One drive to nets. Search for birds on dusk

Fri 10

Light rain – too wet for netting. Search for birds at dawn. Took nets down. Back to camp via west ridge. Dried nets.

Sat 11

Heavy rain – left Nuutele Island 10am.

Sun 11

Rest day

Mon 12

Meetings: MNRE, SPREP

Tues 13

Meetings: MNRE, Director.

Holland & Butler fly out 1.20pm.

(It was no possible to visit Nuulua Island due to the unavailability of an experienced boat person).

Methods:

Mist-netting

Lines for the placing of mist-nets were first cut with machetes then weeded and cleared of branches, twigs, etc. by hand. Four new nets totalling 45m were erected at all sites and a fifth old one at two sites to give c. 52m. Once the nets were in place, 1-3 people remained with them while the rest of the team (5-7 people) headed away quietly, fanned out, then returned in a line to the nets. Most such drives were done making considerable noise but a couple were done quietly to see if this made any difference. Locations of mist-net sites were obtained using a GPS.

Searches

At various times during the survey, individuals, pairs or a larger group searched intently for birds moving slowly and quietly. Much of the island was covered in this way during the course of the trip.

Bird count transect

A transect of nine stations 200m apart was established running from Vini Beach (edge of clearing behind buildings) to the flat behind Nuutele Beach. This transect was counted twice (by Toni and Samani on the 1st and by Samani on the 2nd). The location of each count station was obtained using a GPS.

Note: An additional station 6 was marked prior to a change of route to avoid steep areas. This marker needs removal (using the GPS reading to locate it).

Bird observations

Records were kept of all bird species seen. No counts were made from boats – seabird observations were made from Vini Beach (including walks to both ends) and Nuutele Beach.

Photopoints

A series of four digital photos were taken from bird count stations 1 to 8 facing magnetic N, S, E & W using a tripod-mounted Kodak EasyShare DX6340 camera.

Results:

Netting of/ searching for Friendly Ground Doves

There was only one certain sighting, by Butler of a bird flying ahead twice as the team walked down to the flat behind Nuutele Beach on the 7th. Tipamaa reported a possible sighting further along that flat the same day though this may possibly have been a Samoan starling (seen flying low in this area on another occasion. No birds were seen during drives, either by those pushing through the forest or waiting at nets.

One Samoan broadbill and 5 Samoan whistlers were caught in the nets, photographed and released.

Bird Counts

The count results were as follows:

Photopoints

Sheets holding 36 prints (4 for each station 1-8, 4 edited to increase exposure) were attached to the copy of this report sent to MNRE. They will later be transferred to a CD as .jpg's.

All photos were taken with the camera mounted on the tripod 1m off the ground. The tripod was placed adjacent to the tree holding the bird station marker, on the same side unless stated below.

Station	Camera placement
1	1.5m from station tree at 128° bearing from it
2	1.5m from station tree at 30° bearing from it
3	90cm from base of station tree at 100° bearing from it
4	Below twist of vine on station tree
5	1m in front of station tree
6	1m directly down slope of station tree
7	1m from station tree at 340° bearing from it
8	1.5m from station tree at 340° bearing from it

Bird Observations

The following birds were recorded on the island:

Friendly ground dove (tuameo) – 1, possibly 2 seen.

Tooth-billed pigeon (manumea) – sighted twice on summit ridge near station 4.

Pacific pigeon (lupe) – regularly seen/heard – 3 seen flying on to the island from Upolu during frigatebird count (below)

White-throated pigeon (fiaui) – 1 seen towards Nuutele

Many-coloured and crimson-crowned fruit doves – fairly frequently heard

Greater frigatebirds – count was made on evening of the 8th from 5pm (when first birds evident) till 6.40pm (almost dark), from Vini Beach in front of buildings, of birds flying over relatively high from WNW direction (same phenomenon seen other evenings) – 382 birds counted. Presumed heading to roost on other side of Nuutele or Nuulua).

Brown booby – c6 flying above Nuutele Beach, 2 at W. end of Vini Beach.

Red-footed booby – seen collecting twigs for nests, 15 in trees beyond W. end of Vini beach
White tern – 3 above Nuutele Beach
Brown noddy (common noddy) – c50 on cliffs at E. end of Vini Beach (as disturbed by walking to end of beach); c45 on cliffs at W. end of Vini Beach (as disturbed by walking to end of wave platform there) – not yet on eggs - c20 around Nuutele Beach;
Kingfisher – Nuutele Beach
Barn owl – Vini beach flat
Robin – seen/heard near top of climb above Vini
Tattler – 3 at Vini, 1 at Nuutele
Reef heron – 1 at Vini
Ve'a – 1 heard at Vini
Pekapeka – common in evenings
Samoan whistler – maybe the most numerous bird
Wattled honeyeater – also very numerous
Samoan broadbill – at several locations
Samoan starling – common – 53 counted seen flying on to the island from Upolu at dusk during the frigatebird count in groups of up to 9 birds

Pigs

The escape of the pigs previously held in a pen at Vini is a potential disaster for the island's fauna and flora. Four animals were seen at Vini, 2 large brown & white, 1 large black, 1 small black and 2 large ones at Nuutele where the forest flat is being severely damaged by rooting. These animals need to be removed/shot as a matter of urgency. They would threaten the continued survival of the doves when nesting, among many other impacts.

Logistics

Aviculture:

The cages built in sections at Auckland Zoo proved easy to transport to the island and to erect on site. A platform to keep them off the ground and away from rats was easily built from trees trunks cut and lashed together. No food suitable for the doves is available in Samoa so it was necessary to import bird seed. The platform was placed on the flat behind Vini Beach as it would have been difficult to carry the elements up the hill. This would have presented problems for any birds caught on the other side of the island, e.g. on the flat behind Nuutele Beach, as the walk across and climb down to Vini was considered to pose an unacceptable risk to the birds of stress and overheating. Any birds caught on the island's summit were to have been carried to Vini in bird bags inside a backpack. How long birds could be held like this could not be determined.

Banding and netting equipment:

The NZ Banding Office did not have a band size recorded for this species. Bands of size Y were taken to the island based on the following analysis:

Staff at the Museum of New Zealand measured the legs of ground dove and rock pigeon skins held there. They determined that the internal band diameter for doves needed to be greater than 3.8mm (max. mid shaft) and less than 6mm (upper leg joint)

and for comparison rock pigeons' measurements were 4.7mm (max. mid shaft) and 7.5mm (upper leg joint).

The Banding Manual identifies that rock doves take an H band - internal 7.5mm. This obviously does not go over the upper leg joint which on a live bird must be greater than the 7.5mm the museum measured (skins are dried so the live birds will be bigger). Applying the same formula to ground doves means that the band diameter required is the same as the upper leg joint measurement - i.e. 6mm. An E band at 6.5mm would be too big so Y bands (5.5mm) seemed the answer.

The 2.6 x 12m nets proved ideal for setting up in the Nuutele forest. How successful they would be in catching birds was not determined.

Camping/cooking equipment:

MNRE has limited equipment and most of that required for this trip had to be purchased prior to departure from Apia using expedition funds. A full day needs to be allocated for a sizeable team to reach the islands because of the difficulties of lining up personnel, supplies, vehicles and boats.

Access, etc:

The climb on Nuutele from Vini Beach to the summit plateau is very demanding, particularly in wet weather. It involves 1 to 1^{1/4} hr of walking and scrambling up a steep muddy slope and limits the ease with which equipment and supplies can be positioned on top. Most people will slip and fall in a week of climbing this slope with associated risks of injury to ankles, knees, etc. It would be dangerous to attempt after dark. The island is very hard on footwear and several people were going to throw boots away at the end of the trip.

Vini Beach can be accessed in most weather and tidal conditions though landings are not without risk. There are two buildings situated there and abundant coconuts. Nuutele Beach offers easier access to the interior of the island but has no cuts in the reef which makes boat access much more difficult.

The Marine Protected Area programme's boat was unavailable following the mechanical problems experienced during PPCII's visit to Nuutele the previous month which had forced some people to swim ashore. This meant that a local alia (aluminium catamaran) had to be hired to ferry people across to the aluminium dinghy which did the final landings. This meant greater cost though the alia could accommodate all the party and equipment in comfort.

One of the team had to leave the island and attend the hospital in Apia to remove an insect from inside the ear.

Conclusions:

Ground dove population

Few ground doves appear to be present on Nuutele. Casual sightings of several birds during previous trips had led to the belief that a viable population survived there. It was expected that a team concentrating solely on locating these birds would obtain

more sightings than previous trips and confirm this. This was clearly not the case and there may be less than 10 birds on the island. Clearly catching enough birds to protect the population immediately prior to the rat eradication effort seems impractical.

It is difficult to determine whether the population has declined in recent years though there is evidence of this. Annex 1 summarises previous reports on Nuutele since 1991 when the lowland survey team heard and saw doves along the summit ridge during a 2-day visit in the same month (September). They suggested a 'small, possible stable population' (Park et al. 1992). This is not the case in September 14 years later. The presence of Pacific rats and more recently feral pigs makes a decline not unexpected.

Nuulua was not visited on this trip. A few ground doves remain there though the presence of Pacific rats and yellow crazy ants make their future uncertain.

Options for managing ground doves

1/ Catching and holding birds immediately prior to the operation

A greater effort on Nuutele using the techniques used this time (larger team or longer stay, more mist-nets in more locations) would be likely to result in the capture of birds. Other techniques could be developed to locate birds:

- Using a dog – a NZ-based dog trained on ground birds (weka, kiwi) could be of value though this is uncertain
- Using taped calls to lure birds – it is uncertain if recordings exist. If so they are quite likely to be of little use as similar doves elsewhere will not respond to calls (N. Barre, pers. comm.).

There are major logistical issues and costs involved in developing further techniques or mounting a greater effort with limited guarantees of success. It appears anyhow that it would be very difficult to catch enough birds to ensure the survival of the population post-eradication operation.

2/ Catching birds at another time of year

There may be other times of year when the doves are more active, vocal and easier to detect and capture. This approach would require birds to be kept in captivity for a longer period requiring a facility on Upolu that does not currently exist. Again, not enough birds might be obtained to secure the population.

3/ Testing whether the doves will take the baits.

It is thought likely that some doves would attempt to feed on some baits as they fragmented but not certain. It might be possible (practicality and costs uncertain) to feed non-toxic baits to birds in Tonga or Fiji where they remain quite common on some smaller islands - there do not appear to be any of this species in captivity. If the birds did eat the baits, nothing is gained by this approach. If they do not do so, we cannot be sure that they would behave the same on Nuutele in an environment where rats may have changed the range of foods available.

4/ Running the operation in such a way as to protect birds.

It has been suggested that the more accessible parts of Nuutele could be treated by a ground-based poisoning operation which would make the baits largely unavailable to birds. The cliffs would be treated using the helicopter. This option has the following drawbacks:

- Only one dove was located in the readily-accessed part of the island this trip
- There is evidence from Ofu in American Samoa (same species) and French Polynesia (related species) (Barre, pers. comm.) that ground doves favour steep slopes/cliff areas
- A bait station operation would be costly and logistically difficult to run and monitor and would require the involvement of a larger team from overseas.

5/ Do nothing

It is clear that a major, costly effort would be needed to capture enough birds on Nuutele and Nuulua to guarantee protection of these populations. It may even be too late and a few old, unproductive individuals may be all that are left – rats (and now pigs) could have prevented any production in recent years.

It seems that such an effort, with success uncertain, may not be justified. An alternative approach is to undertake the rat operation with an aerial drop across both island as planned, expecting any doves present on Nuutele after this to thrive, breed rapidly (as they have done in captivity) and re-establish healthy populations. (It is less certain what would happen on Nuulua where the crazy ants may prevent dove recovery).

Choosing the favoured option

Discussions within the team lead to the ‘do nothing’ option being put forward for further discussion. For further major efforts to catch birds on the islands to be justified we would require proof of the following:

1. the Samoan form is sufficiently distinct from those in other countries that every effort should be made to preserve it
2. the Samoan form is endangered and Nuutele and Nuulua are its last strongholds.

If 1/ is researched and it is found that the Samoan form is not distinct, it could be a relatively simple matter to re-introduce birds from healthy populations in Fiji or Tonga if Nuutele and Nuulua populations went extinct.

If more work is done on 2/ it might be found that there are healthier populations on Upolu, or possibly more likely on uplands of Savaii where birds could more easily be caught. These could be used to restock Nuutele and Nuulua if required.

Recommendations

These findings will require discussion among those involved in planning the rat eradication. The following are the recommendations of the survey team:

1/ Conduct a study using DNA analysis to determine the genetic differences between the ground dove in Samoa – using a bird found dead on Upolu after Cyclone Heta and currently in a collection in Germany (and perhaps museum skins) – and in Fiji, Tonga (and possibly American Samoa and Wallis & Futuna). Confirm if Samoan birds are sufficiently different to be termed separate sub-species, as the current taxonomy, or species.

2/ If the Samoan form proves distinct, make a greater effort to preserve the Samoan race.

Step 1: Determine where the best site in the country is to either try to manage the birds in situ or collect birds for captivity. The 1+ year survey of the tooth-billed pigeon and mao survey currently underway will cover the best remaining areas of forest of the main islands and will be looking out for ground doves.

Step 2: If no significant populations can be found then catching any individuals that can be obtained and moving them to captivity may be the best option. This would require the establishment of a breeding programme in a new facility at Vailima. Nuutele and Nuulua would be one of the sites where efforts would be made to capture birds.

3/ If the Samoan form does not prove distinct, continue aerial eradication as planned. If this does not occur then the extinction of the doves on Nuutele and Nuulua is almost inevitable. Monitor the survival of doves. Any pairs that do survive are expected to be very productive in a rat-free environment.

4/ The pigs loose on Nuutele need to be eradicated as soon as possible before more breeding occurs. The owner has agreed to undertake this and pressure needs to be maintained on him. A visit by the manumea/mao survey team shortly provides one occasion to monitor progress.

5/ Consideration needs to be given to providing staff some form of equipment allowance when undertaking fieldwork. This would help address the problem of the damage to footwear caused by work on Nuutele. In New Zealand such an allowance includes small daily entitlements if people supply their own boots, camera, day pack, binoculars, etc.

Timeline

October-December 2005 - Carry out DNA study.

December 2005 - Review findings, determine future actions.

Annex 1: Regional information on the current status of the species:

American Samoa – now confined to Ofu (popn. est. 10 birds) – recent data is being sought from the Department of Marine & Wildlife Resources.

Tonga: – ‘at risk’ – found on a few uninhabited islands – Hungas, Late (cat-free), Fanualei.

Surveys (1995-96) of 17 islands in Vavau Group. (Steadman et al., 1999) – (excludes volcanic islands of Late and Fonualei lie to W and N separated by deep water). GD ‘extremely rare’ – only found on slopes of Mo’ungalafa one of largest areas of contiguous forest on main island of ‘Uta Vava’u (95 sqkm) (0.05 birds/station of 59 counts on this mountain = 6 different calling birds) – in presence of kiore and ship rat & ?Norway rat. Area where birds found being logged in July 1995 so Ground Dove unlikely to survive on Vavau.

Fiji: – ‘ conservation concern’ - widespread and common on some smaller islands.

Wallis & Futuna: only on small island of Alofi.

Samoa:

Survey of uplands of Upolu and Savaii. 1996

Only recorded at 3 sites all on Savaii: Aopo, Silisili, Salailua).

Survey of key lowland sites. 1991.

Only recorded on the Aleipata Islands as follows:

Only 1 GD heard on Nuulua – others may have been overlooked because the forest area appeared big enough to support a small population.

Nuutele – GD’s were seen and heard along the summit ridge and our observations suggest a small, possibly stable population. (Only recorded on these 2 islands during survey). Park et al. 1992.

Recent expeditions to Aleipata Islands

25-29, 31 July 2000 4 people - Nuutele – 3 seen top 2/3rds of island (near trap/pitfall site 8, between sites 10-11, ?third record) Nuulua – seen but not clearly.

4-9 June 2001 ? people – Nuutele – 2 seen, Nuulua – 0 seen.

16-22 June 2003 6 people – Nuutele – 2 seen (near top of climb, on plateau on lower part of stream before large figs) Nuulua – 2 seen (flat behind camp, over top of ridge forming high point of island). Parrish et al. (2004) comment as follows: ‘We have seen few (ground doves) on our visits and it may not be as safe on the islands as previously thought by others’.

Other studies:

Not recorded during 3-year residency of an Australian ornithologist in Samoa (1994-97) (Tarburton, M.K. 2001. Observations on the status of the land birds, wading birds and seabirds of Samoa. Emu 101: 349-360).

Dead bird on Upolu:

A female bird was found dead after Cyclone Heta (Jan 2004) off Cross Island Road on Upolu. This bird is currently held by Ulf Beichle at a collection in Germany.

Reference:

Samoan references included in the project plan are not included again here.

Steadman, D.W., Franklin, J., Drake, D.R., Freifeld, H.B., Bolick, L.A., Smith, D.F. & Motley, T.J. 1999. Conservation status of forests and vertebrate communities in the Vava'u Island Group, Tonga. *Pacific Conservation Biology* 5: 191-207.